

|                                                           | Page | Room            | Sunday | Monday |    | Tuesday |    | Wednesday |    | Thursday |    |
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| Programming Highlights                                    |      |                 |        |        |    |         |    |           |    |          |    |
| MS&T'11 Opening Plenary Session                           | 34   | Ballroom I & II |        | X      |    |         |    |           |    |          |    |
| ACerS Arthur L. Friedberg Memorial Lecture                | 51   | C113/114        |        |        |    | X       |    |           |    |          |    |
| ACerS Cooper Award Session                                | 40   | C111            |        |        | X  |         |    |           |    |          |    |
| ACerS Edward Orton Jr. Memorial Lecture                   | 70   | C113/114        |        |        |    |         | X  |           |    |          |    |
| ACerS Frontiers of Science and Society Rustum Roy Lecture | 34   | C113/114        | X      |        |    |         |    |           |    |          |    |
| ACerS Richard M. Fulrath Award Symposium                  | 34   | C113/114        |        |        | X  |         |    |           |    |          |    |
| ACerS Robert B. Sosman Lecture                            | 105  | C113/114        |        |        |    |         |    |           | X  |          |    |
| AIST Adolf Martens Memorial Steel Lecture                 | 106  | D131            |        |        |    |         |    |           | X  |          |    |
| ASM Alpha Sigma Mu Lecture                                | 36   | D131            |        |        | X  |         |    |           |    |          |    |
| ASM Edward DeMille Campbell Memorial Lecture              | 71   | D131            |        |        |    |         | X  |           |    |          |    |

## Biomaterials

### Emerging Frontiers in Surface Engineering of Biomaterials

|                                            |    |      |  |  |   |   |   |  |  |  |  |
|--------------------------------------------|----|------|--|--|---|---|---|--|--|--|--|
| Biocoatings and Surface Engineering        | 55 | C226 |  |  |   | X |   |  |  |  |  |
| Biocoatings and Surface Protection         | 72 | C226 |  |  |   |   | X |  |  |  |  |
| Smart Surfaces, Nano Structure and Systems | 38 | C226 |  |  | X |   |   |  |  |  |  |

### Next Generation Biomaterials

|                                                  |     |          |  |  |   |   |   |   |   |   |   |
|--------------------------------------------------|-----|----------|--|--|---|---|---|---|---|---|---|
| Advanced Biomaterials                            | 98  | C215     |  |  |   |   |   | X |   |   |   |
| Biomaterials Engineering                         | 141 | C215     |  |  |   |   |   |   |   |   | X |
| Biomaterials Science and Technology              | 132 | C215     |  |  |   |   |   |   |   | X |   |
| Ceramic Biomaterials                             | 46  | C215     |  |  | X |   |   |   |   |   |   |
| Frontiers in Biological and Biomedical Materials | 99  | B200/201 |  |  |   |   |   | X |   |   |   |
| Metallic, Polymeric, and Ceramic Biomaterials    | 79  | C215     |  |  |   |   | X |   |   |   |   |
| Next Generation Biomaterials                     | 117 | C215     |  |  |   |   |   |   | X |   |   |
| Tissue Engineering                               | 65  | C215     |  |  |   | X |   |   |   |   |   |

### Surface Properties of Biomaterials

|                                             |     |      |  |  |   |   |   |   |   |  |  |
|---------------------------------------------|-----|------|--|--|---|---|---|---|---|--|--|
| Antimicrobial Coatings and Surface Analysis | 104 | C216 |  |  |   |   |   | X |   |  |  |
| Bioglass and Cellular Interactions          | 82  | C216 |  |  |   |   | X |   |   |  |  |
| Biopolymers and Surface Modifications       | 69  | C216 |  |  |   | X |   |   |   |  |  |
| Drug Delivery                               | 50  | C216 |  |  | X |   |   |   |   |  |  |
| Surface Modification                        | 121 | C216 |  |  |   |   |   |   | X |  |  |

## Ceramic and Glass Materials

### Ceramic Matrix Composites

|                                |     |      |  |  |   |   |   |   |   |   |  |
|--------------------------------|-----|------|--|--|---|---|---|---|---|---|--|
| CMC Applications               | 36  | C112 |  |  | X |   |   |   |   |   |  |
| Environmental Effects/Coatings | 53  | C112 |  |  |   | X |   |   |   |   |  |
| Foreign Object Damage          | 71  | C112 |  |  |   |   | X |   |   |   |  |
| Mechanical Behavior            | 123 | C112 |  |  |   |   |   |   |   | X |  |
| Modeling/Characterization      | 107 | C112 |  |  |   |   |   |   | X |   |  |
| Processing/Fabrication         | 86  | C112 |  |  |   |   |   | X |   |   |  |

### Glass and Optical Materials

|                                          |    |      |  |  |   |  |   |   |  |  |  |
|------------------------------------------|----|------|--|--|---|--|---|---|--|--|--|
| Cooper Award Session on Glass Relaxation | 40 | C111 |  |  | X |  |   |   |  |  |  |
| Glass Modeling and Simulation I          | 74 | C111 |  |  |   |  | X |   |  |  |  |
| Glass Modeling and Simulation II         | 91 | C111 |  |  |   |  |   | X |  |  |  |

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| Glass and Optical Materials (cont.)                |      |      |        |        |    |         |    |           |    |          |    |
| Optical Materials I                                | 57   | C111 |        |        |    | X       |    |           |    |          |    |
| Optical Materials II                               | 58   | C111 |        |        |    | X       |    |           |    |          |    |
| Structure and Properties Characterization in Glass | 127  | C110 |        |        |    |         |    |           |    | X        |    |
| Structure-Properties Relationship in Glass         | 91   | C111 |        |        |    |         |    | X         |    |          |    |

#### Innovative Processing and Synthesis of Ceramics, Glasses and Composites

|                                                      |     |      |  |   |   |   |   |   |  |  |
|------------------------------------------------------|-----|------|--|---|---|---|---|---|--|--|
| Advanced Processing and Characterization             | 41  | C110 |  | X |   |   |   |   |  |  |
| Bio-and Electro-Ceramics, Films and Coatings         | 93  | C110 |  |   |   |   | X |   |  |  |
| CVD, Plasma Spray, Inkjet and Laser Processing       | 75  | C110 |  |   |   | X |   |   |  |  |
| Novel Synthesis and Processing                       | 59  | C110 |  |   | X |   |   |   |  |  |
| Processing and Microstructure-Property Relationships | 111 | C110 |  |   |   |   |   | X |  |  |

#### Multifunctional Oxides

|             |     |       |  |   |   |   |   |   |  |  |
|-------------|-----|-------|--|---|---|---|---|---|--|--|
| Session I   | 45  | E162A |  | X |   |   |   |   |  |  |
| Session II  | 64  | E162A |  |   | X |   |   |   |  |  |
| Session III | 79  | E162A |  |   |   | X |   |   |  |  |
| Session IV  | 97  | E162A |  |   |   |   | X |   |  |  |
| Session V   | 116 | E162A |  |   |   |   |   | X |  |  |

#### Refractory Materials

|                                     |     |      |  |  |  |  |  |   |  |  |
|-------------------------------------|-----|------|--|--|--|--|--|---|--|--|
| Refractory Ceramics General Session | 102 | C226 |  |  |  |  |  | X |  |  |
|-------------------------------------|-----|------|--|--|--|--|--|---|--|--|

#### Richard M. Fulrath Award Symposium

|  |    |          |  |   |  |  |  |  |  |  |
|--|----|----------|--|---|--|--|--|--|--|--|
|  | 34 | C113/114 |  | X |  |  |  |  |  |  |
|--|----|----------|--|---|--|--|--|--|--|--|

#### Solution-Based Processing for Ceramic Materials

|                                                                                  |     |      |  |  |  |  |  |   |   |   |
|----------------------------------------------------------------------------------|-----|------|--|--|--|--|--|---|---|---|
| Electric Field-Assisted Fabrication and Assembly                                 | 142 | C111 |  |  |  |  |  |   |   | X |
| Solution Deposition, Assembly, and Patterning of Functional Films and Structures | 134 | C111 |  |  |  |  |  |   | X |   |
| Solution Synthesis of Ceramic Powders and Structures                             | 120 | C111 |  |  |  |  |  | X |   |   |

#### ACerS Robert B. Sosman Award Symposium: Interface Structure and Microstructure Evolution in Ceramics

|  |     |          |  |  |  |  |  |   |  |  |
|--|-----|----------|--|--|--|--|--|---|--|--|
|  | 103 | C113/114 |  |  |  |  |  | X |  |  |
|--|-----|----------|--|--|--|--|--|---|--|--|

### Electronic and Magnetic Materials

#### Advances in Dielectric Materials and Electronic Devices

|                                                 |     |      |  |   |   |   |   |   |  |  |
|-------------------------------------------------|-----|------|--|---|---|---|---|---|--|--|
| Materials and Applications I                    | 70  | C220 |  |   |   | X |   |   |  |  |
| Materials and Applications II                   | 106 | C220 |  |   |   |   |   | X |  |  |
| Materials Preparation and Properties            | 52  | C220 |  |   | X |   |   |   |  |  |
| Materials Synthesis, Preparation and Processing | 35  | C220 |  | X |   |   |   |   |  |  |
| Processing-Property-Microstructure Relationship | 85  | C220 |  |   |   |   | X |   |  |  |

#### Magnetoelectric Multiferroic Thin Films and Multilayers

|                                                |    |      |  |  |   |   |  |  |  |  |
|------------------------------------------------|----|------|--|--|---|---|--|--|--|--|
| Magnetoelectric Microstructures and Properties | 78 | C221 |  |  |   | X |  |  |  |  |
| Multiferroic Materials                         | 63 | C221 |  |  | X |   |  |  |  |  |

#### Pb-Free Solders and Next Generation Interconnects

|                                                            |    |       |  |  |   |   |  |  |  |  |
|------------------------------------------------------------|----|-------|--|--|---|---|--|--|--|--|
| Electrically Conductive Adhesives                          | 80 | E160B |  |  |   | X |  |  |  |  |
| Electromigration and Reliability Issues of Pb-Free Solders | 66 | E160B |  |  | X |   |  |  |  |  |

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## Pb-Free Solders and Next Generation Interconnects (cont.)

|                                                                             |     |       |  |  |   |  |  |   |  |  |
|-----------------------------------------------------------------------------|-----|-------|--|--|---|--|--|---|--|--|
| Microstructure, Crystallography, and Mechanical Behavior of Pb-free Solders | 100 | E160B |  |  |   |  |  | X |  |  |
| Next Generation Interconnects                                               | 47  | E160B |  |  | X |  |  |   |  |  |

## Semiconductor Heterostructures: Theory, Growth, Characterization and Device Applications

|  |    |      |  |  |   |  |  |  |  |  |
|--|----|------|--|--|---|--|--|--|--|--|
|  | 48 | C221 |  |  | X |  |  |  |  |  |
|--|----|------|--|--|---|--|--|--|--|--|

## Environmental and Energy Issues

### Energy Conversion/Fuel Cells

|                                                       |     |      |  |  |   |   |   |   |  |  |
|-------------------------------------------------------|-----|------|--|--|---|---|---|---|--|--|
| Electrode Materials                                   | 89  | C224 |  |  |   |   |   | X |  |  |
| Electrolyte Materials                                 | 73  | C224 |  |  |   |   | X |   |  |  |
| Heterogeneous Functional Materials for Energy Systems | 55  | C224 |  |  |   | X |   |   |  |  |
| Interconnect Coatings                                 | 109 | C224 |  |  |   |   |   | X |  |  |
| System, Stack and Component Design                    | 38  | C224 |  |  | X |   |   |   |  |  |

### Energy Storage: Materials, Systems and Applications

|                                                    |     |      |  |  |   |   |  |   |   |  |
|----------------------------------------------------|-----|------|--|--|---|---|--|---|---|--|
| Energy Storage for Transportation Applications I   | 39  | C223 |  |  | X |   |  |   |   |  |
| Energy Storage for Transportation Applications II  | 55  | C223 |  |  |   | X |  |   |   |  |
| Energy Storage for Transportation Applications III | 109 | C223 |  |  |   |   |  | X |   |  |
| Flow, Li-Air, and Other Batteries                  | 73  | C223 |  |  |   | X |  |   |   |  |
| Hydrogen Storage and Thermoelectric Materials      | 125 | C223 |  |  |   |   |  |   | X |  |
| Na-Batteries                                       | 89  | C223 |  |  |   |   |  | X |   |  |

### Materials Degradation in Alternative Energy Systems

|  |     |      |  |  |  |  |  |  |  |   |
|--|-----|------|--|--|--|--|--|--|--|---|
|  | 139 | C223 |  |  |  |  |  |  |  | X |
|--|-----|------|--|--|--|--|--|--|--|---|

### Materials for Nuclear Waste Disposal and Environmental Cleanup

|                                                                         |     |      |  |  |  |  |  |   |   |   |
|-------------------------------------------------------------------------|-----|------|--|--|--|--|--|---|---|---|
| Materials and Processes for Nuclear Materials Storage and Handling      | 130 | C226 |  |  |  |  |  |   | X |   |
| Processing and Characterization of Salts for Nuclear Waste Disposal     | 114 | C226 |  |  |  |  |  | X |   |   |
| Vitrification and Glass Characterization for Nuclear Materials Disposal | 140 | C226 |  |  |  |  |  |   |   | X |
| Waste Forms for Nuclear Disposition                                     | 115 | C226 |  |  |  |  |  | X |   |   |

### Materials Science Challenges for Nuclear Applications

|                                    |     |      |  |  |   |   |   |   |   |  |
|------------------------------------|-----|------|--|--|---|---|---|---|---|--|
| Defects and Diffusion in Materials | 63  | C225 |  |  |   | X |   |   |   |  |
| Defects in Irradiated Alloys       | 44  | C225 |  |  | X |   |   |   |   |  |
| High Temperature Materials         | 130 | C225 |  |  |   |   |   |   | X |  |
| Ion Irradiation Effects            | 45  | C225 |  |  | X |   |   |   |   |  |
| Materials Degradation I            | 115 | C225 |  |  |   |   |   | X |   |  |
| Materials Degradation II           | 115 | C225 |  |  |   |   |   | X |   |  |
| Microstructure Evolution           | 78  | C225 |  |  |   |   | X |   |   |  |
| Nanostructured Materials           | 78  | C225 |  |  |   |   | X |   |   |  |
| Nuclear Fuels I                    | 97  | C225 |  |  |   |   |   | X |   |  |
| Nuclear Fuels II                   | 97  | C225 |  |  |   |   |   | X |   |  |
| Simulation of Reactor Materials    | 63  | C225 |  |  |   | X |   |   |   |  |

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|---------------------------------------------------------------------------------------------------------------------|------|----------|--------------|--------------|--------------|---------------|---------------|-----------------|-----------------|----------------|----------------|
| Fundamentals and Characterization                                                                                   |      |          |              |              |              |               |               |                 |                 |                |                |
| Advanced Developments in Electron Microscopy                                                                        |      |          |              |              |              |               |               |                 |                 |                |                |
| Advanced Materials Applications                                                                                     | 122  | E160A    |              |              |              |               |               |                 |                 | X              |                |
| In-Situ Techniques                                                                                                  | 106  | E160A    |              |              |              |               |               |                 | X               |                |                |
| Novel Microscopy Techniques                                                                                         | 84   | E160A    |              |              |              |               |               | X               |                 |                |                |
| Amorphous Materials: Common Issues within Science and Technology                                                    |      |          |              |              |              |               |               |                 |                 |                |                |
| Glass in 21st Century                                                                                               | 86   | C211     |              |              |              |               |               | X               |                 |                |                |
| Glass Technology                                                                                                    | 123  | C211     |              |              |              |               |               |                 |                 | X              |                |
| Mechanical Properties of Glass I                                                                                    | 123  | C211     |              |              |              |               |               |                 |                 | X              |                |
| Mechanical Properties of Glass II                                                                                   | 123  | C211     |              |              |              |               |               |                 |                 | X              |                |
| Metallic Glass I                                                                                                    | 137  | C211     |              |              |              |               |               |                 |                 |                | X              |
| Metallic Glass II                                                                                                   | 137  | C211     |              |              |              |               |               |                 |                 |                | X              |
| Deformation and Transitions at Grain Boundaries                                                                     |      |          |              |              |              |               |               |                 |                 |                |                |
| Anisotropy Effects on Grain Boundaries                                                                              | 72   | C121     |              |              |              |               | X             |                 |                 |                |                |
| Boundary Characterization Methodology                                                                               | 37   | C121     |              |              | X            |               |               |                 |                 |                |                |
| Deformation Effects at Grain Boundaries                                                                             | 88   | C121     |              |              |              |               |               | X               |                 |                |                |
| Deformation Twins and Dislocations Interactions with Grain Boundaries                                               | 54   | C121     |              |              |              | X             |               |                 |                 |                |                |
| Effects of Defects and Chemistry on Grain Boundaries                                                                | 125  | C121     |              |              |              |               |               |                 |                 | X              |                |
| Nanocrystalline Grain Boundary Processes                                                                            | 108  | C121     |              |              |              |               |               |                 | X               |                |                |
| ACerS Frontiers of Science and Society Rustum Roy Lecture                                                           |      |          |              |              |              |               |               |                 |                 |                |                |
|                                                                                                                     | 34   | C113/114 | X            |              |              |               |               |                 |                 |                |                |
| Hardness across the Multi-Scales of Structure and Loading Rate                                                      |      |          |              |              |              |               |               |                 |                 |                |                |
| Applications I                                                                                                      | 111  | C210     |              |              |              |               |               |                 | X               |                |                |
| Applications II                                                                                                     | 127  | C210     |              |              |              |               |               |                 |                 | X              |                |
| Loading Rate Aspects                                                                                                | 75   | C210     |              |              |              |               | X             |                 |                 |                |                |
| Stress-Strain Relations                                                                                             | 41   | C210     |              |              | X            |               |               |                 |                 |                |                |
| Structural Aspects I                                                                                                | 58   | C210     |              |              |              | X             |               |                 |                 |                |                |
| Structural Aspects II                                                                                               | 92   | C210     |              |              |              |               |               | X               |                 |                |                |
| Integrated Computational Materials Engineering: Modeling and Simulation Applied to Metals Processing                |      |          |              |              |              |               |               |                 |                 |                |                |
| Elements of ICME: Databases, Microstructure Characterization, and Microstructure and Mechanical Property Prediction | 93   | C213     |              |              |              |               |               | X               |                 |                |                |
| Materials and Manufacturing Process Modeling and Simulation                                                         | 112  | C213     |              |              |              |               |               |                 | X               |                |                |
| Materials Modeling Fundamentals and Applications to Phase Transformation and Microstructure Evolution               | 59   | C213     |              |              |              | X             |               |                 |                 |                |                |
| Modeling and Simulation of Casting Processes and Associated Microstructure Evolution                                | 76   | C213     |              |              |              |               | X             |                 |                 |                |                |
| Modeling and Simulation of Deformation and Associated Microstructure and Mechanical Properties                      | 127  | C213     |              |              |              |               |               |                 |                 | X              |                |

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## Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches -

### Fundamental and Engineering Issues

|                                                                            |     |      |  |  |   |   |   |   |   |   |
|----------------------------------------------------------------------------|-----|------|--|--|---|---|---|---|---|---|
| Bridging the Gap between Continuum and Atomistic Approaches for Interfaces | 42  | C120 |  |  | X |   |   |   |   |   |
| Complex Interfaces                                                         | 128 | C120 |  |  |   |   |   |   | X |   |
| Interface Dynamics                                                         | 60  | C120 |  |  |   | X |   |   |   |   |
| Interface Engineering                                                      | 76  | C120 |  |  |   |   | X |   |   |   |
| Interfaces and Charge Storage                                              | 138 | C120 |  |  |   |   |   |   |   | X |
| Interfaces in Polycrystals                                                 | 94  | C120 |  |  |   |   |   | X |   |   |
| Interfaces, 3-Lines and Wetting                                            | 112 | C120 |  |  |   |   |   | X |   |   |

### International Symposium on Defects, Transport and Related Phenomena

|                                                             |     |      |  |  |   |   |   |   |   |   |
|-------------------------------------------------------------|-----|------|--|--|---|---|---|---|---|---|
| Defects and Transport in Ceramics I                         | 43  | C122 |  |  | X |   |   |   |   |   |
| Defects and Transport in Ceramics II                        | 61  | C122 |  |  |   | X |   |   |   |   |
| Defects and Transport in Ceramics III                       | 77  | C122 |  |  |   |   | X |   |   |   |
| Defects and Transport in Ceramics IV                        | 95  | C122 |  |  |   |   |   | X |   |   |
| Defects and Transport in Materials Related to Fuel Cells I  | 113 | C122 |  |  |   |   |   |   | X |   |
| Defects and Transport in Materials Related to Fuel Cells II | 129 | C122 |  |  |   |   |   |   |   | X |

### Multi Scale Modeling of Microstructure Deformation in Material Processing

|            |    |      |  |  |   |   |  |  |  |  |
|------------|----|------|--|--|---|---|--|--|--|--|
| Session I  | 45 | C211 |  |  | X |   |  |  |  |  |
| Session II | 64 | C211 |  |  |   | X |  |  |  |  |

### Nano- and Atomic-Scale Fracture

|                        |    |      |  |  |   |   |   |  |  |  |
|------------------------|----|------|--|--|---|---|---|--|--|--|
| Atomistics of Fracture | 65 | C125 |  |  |   | X |   |  |  |  |
| Environmental Effects  | 46 | C125 |  |  | X |   |   |  |  |  |
| Nanowires              | 79 | C125 |  |  |   |   | X |  |  |  |

### Phase Stability, Diffusion, Kinetics and their Applications (PSDK-VI)

|                                                                                                 |     |      |  |  |   |   |   |   |   |  |
|-------------------------------------------------------------------------------------------------|-----|------|--|--|---|---|---|---|---|--|
| Alloy Design and Phase Stability Modeling                                                       | 100 | C214 |  |  |   |   |   | X |   |  |
| Diffusion Modeling and Measurement                                                              | 80  | C214 |  |  |   |   | X |   |   |  |
| Phase Stability and Diffusional Processes I                                                     | 47  | C214 |  |  | X |   |   |   |   |  |
| Phase Stability and Diffusional Processes II                                                    | 118 | C214 |  |  |   |   |   |   | X |  |
| Session Honoring John W. Cahn, Recipient of ASM's 2011 J. Williard Gibbs Phase Equilibria Award | 67  | C214 |  |  |   | X |   |   |   |  |

### Recent Advances in Structural Characterization of Materials

|                                   |     |      |  |  |  |   |   |   |   |   |
|-----------------------------------|-----|------|--|--|--|---|---|---|---|---|
| Advanced Methods and Applications | 81  | C212 |  |  |  |   | X |   |   |   |
| Electron Backscatter Diffraction  | 119 | C212 |  |  |  |   |   |   | X |   |
| Scattering Methods                | 101 | C212 |  |  |  |   |   | X |   |   |
| Spectroscopic Methods             | 134 | C212 |  |  |  |   |   |   |   | X |
| Tomographic and Imaging Methods   | 68  | C212 |  |  |  | X |   |   |   |   |

## Iron and Steel

### Advances in Zinc-Based Coating Technologies for Steel Sheet

|                                                                        |     |          |  |  |  |  |  |  |  |   |
|------------------------------------------------------------------------|-----|----------|--|--|--|--|--|--|--|---|
| Advances in Processing and Characterization of Zinc-Coated Steel Sheet | 122 | D144/145 |  |  |  |  |  |  |  | X |
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|                                                                                              |      |          | PM     | AM     | PM | AM      | PM | AM        | PM | AM       | PM |
| Processing, Microstructure and Properties of Cast Irons and Cast and Forged Specialty Steels |      |          |        |        |    |         |    |           |    |          |    |
| Cast and Rolled Steels                                                                       | 142  | D142/143 |        |        |    |         |    |           |    |          | X  |
| Cast Irons                                                                                   | 133  | D142/143 |        |        |    |         |    |           |    | X        |    |
| Forged and Specialty Steels                                                                  | 119  | D142/143 |        |        |    |         |    |           | X  |          |    |

#### Recent Developments in Steel Processing

|            |     |          |  |  |  |  |   |   |  |  |  |
|------------|-----|----------|--|--|--|--|---|---|--|--|--|
| Session I  | 81  | D142/143 |  |  |  |  | X |   |  |  |  |
| Session II | 102 | D142/143 |  |  |  |  |   | X |  |  |  |

#### Steel Product Metallurgy and Applications

|                                  |     |      |  |  |   |   |   |   |   |   |  |
|----------------------------------|-----|------|--|--|---|---|---|---|---|---|--|
| Advanced High Strength Steels I  | 49  | D132 |  |  | X |   |   |   |   |   |  |
| Advanced High Strength Steels II | 68  | D132 |  |  |   | X |   |   |   |   |  |
| Alloying and Precipitation       | 103 | D132 |  |  |   |   |   | X |   |   |  |
| Processing and Performance I     | 120 | D132 |  |  |   |   |   |   | X |   |  |
| Processing and Performance II    | 135 | D132 |  |  |   |   |   |   |   | X |  |
| Tubular and Plate Products       | 82  | D132 |  |  |   |   | X |   |   |   |  |

## Materials Performance

#### Beyond Property Measurement - Mechanical Behavior of Multifunctional Materials Systems

|                                                             |    |      |  |  |   |  |  |  |  |  |  |
|-------------------------------------------------------------|----|------|--|--|---|--|--|--|--|--|--|
| Mechanical Characterization across Multi-Functional Systems | 36 | C212 |  |  | X |  |  |  |  |  |  |
|-------------------------------------------------------------|----|------|--|--|---|--|--|--|--|--|--|

#### Failure Analysis and Prevention

|                                       |     |      |  |  |   |   |   |   |   |   |   |
|---------------------------------------|-----|------|--|--|---|---|---|---|---|---|---|
| Aerospace                             | 90  | D235 |  |  |   |   |   | X |   |   |   |
| Composites                            | 109 | D235 |  |  |   |   |   |   | X |   |   |
| Corrosion and Coatings                | 126 | D235 |  |  |   |   |   |   |   | X |   |
| Fasteners                             | 74  | D235 |  |  |   |   | X |   |   |   |   |
| Fatigue and Fracture                  | 137 | D235 |  |  |   |   |   |   |   |   | X |
| General Topics in Failure Analysis    | 110 | D232 |  |  |   |   |   |   | X |   |   |
| Tools and Techniques                  | 40  | D235 |  |  | X |   |   |   |   |   |   |
| Welding, Joining and General Interest | 56  | D235 |  |  |   | X |   |   |   |   |   |

#### Fatigue and Microstructure: A Symposium on Recent Advances

|                               |     |          |  |  |   |   |   |   |   |   |   |
|-------------------------------|-----|----------|--|--|---|---|---|---|---|---|---|
| Crack Growth and Fracture     | 126 | D240/241 |  |  |   |   |   |   |   | X |   |
| Crack Initiation              | 57  | D240/241 |  |  |   | X |   |   |   |   |   |
| Damage Accumulation           | 40  | D240/241 |  |  | X |   |   |   |   |   |   |
| Dual-Mode Fatigue             | 74  | D240/241 |  |  |   |   | X |   |   |   |   |
| Fatigue of Advanced Materials | 91  | D240/241 |  |  |   |   |   | X |   |   |   |
| Fatigue on Small Scales       | 110 | D240/241 |  |  |   |   |   |   | X |   |   |
| Very High Cycle Fatigue       | 138 | D240/241 |  |  |   |   |   |   |   |   | X |

#### Measurements and Modeling of Advanced Automotive and Structural Materials at Intermediate and High Strain Rates

|                                                    |     |      |  |  |  |  |  |  |   |   |   |
|----------------------------------------------------|-----|------|--|--|--|--|--|--|---|---|---|
| Intermediate-to-High-Rate Material Behavior        | 115 | D231 |  |  |  |  |  |  | X |   |   |
| Intermediate-to-High-Rate Measurement Techniques   | 131 | D231 |  |  |  |  |  |  |   | X |   |
| Intermediate-to-High-Rate Modeling and Measurement | 140 | D231 |  |  |  |  |  |  |   |   | X |

#### Periodic Cellular Materials: Current Status and Recent Progress

|                                       |     |      |  |  |  |  |  |  |  |   |   |
|---------------------------------------|-----|------|--|--|--|--|--|--|--|---|---|
| Gasarites, Foams, and Other Materials | 142 | D233 |  |  |  |  |  |  |  |   | X |
| Lattice Truss Structures              | 132 | D233 |  |  |  |  |  |  |  | X |   |

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|      |      | PM     | AM     | PM | AM      | PM | AM        | PM | AM       | PM |

## Professor K. K. Chawla Honorary Symposium on Fibers, Foams and Composites: Science and Engineering

|                                                      |     |      |  |  |   |   |   |   |   |  |
|------------------------------------------------------|-----|------|--|--|---|---|---|---|---|--|
| Fibers                                               | 119 | D234 |  |  |   |   |   | X |   |  |
| Foams I                                              | 48  | D234 |  |  | X |   |   |   |   |  |
| Foams II                                             | 81  | D234 |  |  |   | X |   |   |   |  |
| Metal Matrix Composites/Ceramic Matrix Composites I  | 67  | D234 |  |  |   | X |   |   |   |  |
| Metal Matrix Composites/Ceramic Matrix Composites II | 133 | D234 |  |  |   |   |   |   | X |  |
| Metal Matrix Composites/Polymer Matrix Composites    | 101 | D234 |  |  |   |   | X |   |   |  |

## Shape Memory Alloys

|                                |    |          |  |  |   |   |  |  |  |  |
|--------------------------------|----|----------|--|--|---|---|--|--|--|--|
| Advanced Alloys                | 48 | D242/243 |  |  | X |   |  |  |  |  |
| Alloy Behavior                 | 82 | D242/243 |  |  |   | X |  |  |  |  |
| Alloy Development and Behavior | 68 | D242/243 |  |  |   | X |  |  |  |  |

## Structural Materials for Aerospace and Defense: Challenges and Prospects

|                                                |     |          |  |  |  |  |   |   |   |   |
|------------------------------------------------|-----|----------|--|--|--|--|---|---|---|---|
| Aluminum and Titanium Alloys                   | 121 | D242/243 |  |  |  |  |   | X |   |   |
| Composites and Nanocomposites                  | 103 | D242/243 |  |  |  |  | X |   |   |   |
| Magnesium Alloys                               | 135 | D242/243 |  |  |  |  |   |   | X |   |
| Methods of Processing and Properties of Alloys | 143 | D242/243 |  |  |  |  |   |   |   | X |
| Nickel-Based and New Alloys                    | 135 | D242/243 |  |  |  |  |   |   | X |   |

## Titanium Processing and Applications

|            |     |      |  |  |  |  |  |  |   |   |
|------------|-----|------|--|--|--|--|--|--|---|---|
| Session I  | 136 | D232 |  |  |  |  |  |  | X |   |
| Session II | 143 | D232 |  |  |  |  |  |  |   | X |

## Materials-Environment Interactions

### Advanced Protective Coatings for Refractory Metals and Alloys

|                                                                                                                   |    |      |  |  |   |   |   |   |  |  |
|-------------------------------------------------------------------------------------------------------------------|----|------|--|--|---|---|---|---|--|--|
| Oxidation Modeling, Synthesis and Performance of Alumina Stabilizing Coatings                                     | 70 | D231 |  |  |   |   | X |   |  |  |
| Recent Development in Oxidation Resistant Refractory Metal Alloys, Composites and Protective Coating Materials I  | 35 | D231 |  |  | X |   |   |   |  |  |
| Recent Development in Oxidation Resistant Refractory Metal Alloys, Composites and Protective Coating Materials II | 51 | D231 |  |  |   | X |   |   |  |  |
| Strategies, Synthesis and Performance of Silicide Coatings                                                        | 85 | D231 |  |  |   |   |   | X |  |  |

### Corrosion Protection Through Metallic and Non-Metallic Coatings

|                                   |     |          |  |  |  |  |  |   |   |  |
|-----------------------------------|-----|----------|--|--|--|--|--|---|---|--|
| Mechanisms and Evaluation         | 88  | D244/245 |  |  |  |  |  | X |   |  |
| Metallic and Refractory Coatings  | 124 | D244/245 |  |  |  |  |  |   | X |  |
| Polymeric and Conversion Coatings | 108 | D244/245 |  |  |  |  |  | X |   |  |

### Environmentally Assisted Cracking of Materials

|             |    |      |  |  |   |   |   |   |  |  |
|-------------|----|------|--|--|---|---|---|---|--|--|
| Session I   | 39 | D233 |  |  | X |   |   |   |  |  |
| Session II  | 56 | D233 |  |  |   | X |   |   |  |  |
| Session III | 73 | D233 |  |  |   |   | X |   |  |  |
| Session IV  | 90 | D233 |  |  |   |   |   | X |  |  |

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### Green Technologies for Materials Manufacturing and Processing III

|                               |    |      |  |  |   |   |   |   |  |  |
|-------------------------------|----|------|--|--|---|---|---|---|--|--|
| Green Manufacturing I         | 41 | D232 |  |  | X |   |   |   |  |  |
| Green Manufacturing II        | 75 | D232 |  |  |   |   | X |   |  |  |
| Green Materials Processing I  | 58 | D232 |  |  |   | X |   |   |  |  |
| Green Materials Processing II | 92 | D232 |  |  |   |   |   | X |  |  |

### Localized Corrosion - Measurement, Mechanisms and Mitigation

|                            |    |          |  |  |   |   |  |  |  |  |
|----------------------------|----|----------|--|--|---|---|--|--|--|--|
| Assorted Effects           | 62 | D244/245 |  |  |   | X |  |  |  |  |
| High Temperature Corrosion | 63 | D244/245 |  |  |   | X |  |  |  |  |
| Light Metals               | 44 | D244/245 |  |  | X |   |  |  |  |  |

## Nanotechnology

### Controlled Synthesis, Processing and Applications of Structural and Functional Nanomaterials

|                                    |     |      |  |  |   |   |   |   |   |   |
|------------------------------------|-----|------|--|--|---|---|---|---|---|---|
| Nanomaterial Applications          | 137 | C123 |  |  |   |   |   |   |   | X |
| One Dimensional Nanomaterials I    | 54  | C123 |  |  |   | X |   |   |   |   |
| One Dimensional Nanomaterials II   | 72  | C123 |  |  |   |   | X |   |   |   |
| Three Dimensional Nanomaterials I  | 107 | C123 |  |  |   |   |   | X |   |   |
| Three Dimensional Nanomaterials II | 124 | C123 |  |  |   |   |   |   | X |   |
| Two Dimensional Nanomaterials      | 87  | C123 |  |  |   |   |   | X |   |   |
| Zero Dimension Nanomaterials       | 37  | C123 |  |  | X |   |   |   |   |   |

### International Symposium on Advances in Nanostructured Materials and

### Applications: The 2011 Acta Materialia Gold Medal Symposium

|                                                                         |     |      |  |  |   |   |   |   |   |   |
|-------------------------------------------------------------------------|-----|------|--|--|---|---|---|---|---|---|
| Multidisciplinary Research in Nanomaterials                             | 42  | E170 |  |  | X |   |   |   |   |   |
| Nanoceramics I: Oxides and Thin Film Interfaces                         | 60  | E170 |  |  |   | X |   |   |   |   |
| Nanoceramics II: Nanomaterials and Their Applications                   | 113 | E170 |  |  |   |   |   | X |   |   |
| Nanometals I: Deformation Mechanisms in Nanostructured Metals           | 76  | E170 |  |  |   |   | X |   |   |   |
| Nanometals II: Size Effects in Metals, Nanotwins, Nanolayers and Others | 94  | E170 |  |  |   |   |   | X |   |   |
| Nanometals III: Bulk Nanostructured Metals                              | 139 | E170 |  |  |   |   |   |   |   | X |
| Nanoscale Characterizations and Carbon Related Nanomaterials            | 129 | E170 |  |  |   |   |   |   | X |   |

### Nanotechnology for Energy, Healthcare and Industry

|             |     |      |  |  |  |  |  |   |   |   |
|-------------|-----|------|--|--|--|--|--|---|---|---|
| Session I   | 98  | C125 |  |  |  |  |  | X |   |   |
| Session II  | 117 | C125 |  |  |  |  |  |   | X |   |
| Session III | 131 | C125 |  |  |  |  |  |   |   | X |
| Session IV  | 141 | C125 |  |  |  |  |  |   |   | X |

### Synthesis, Properties and Applications of Noble Metal Nanostructures

|                                                               |     |      |  |  |  |  |  |  |  |   |
|---------------------------------------------------------------|-----|------|--|--|--|--|--|--|--|---|
| Fabrication and Characterization of Noble Metal Nanoparticles | 136 | C115 |  |  |  |  |  |  |  | X |
| Functional Metal Thin Films                                   | 143 | C115 |  |  |  |  |  |  |  | X |



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## Processing and Product Manufacturing

### Additive Manufacturing of Metals

|                                                         |     |      |  |  |   |   |   |   |  |   |  |
|---------------------------------------------------------|-----|------|--|--|---|---|---|---|--|---|--|
| Additive Manufacturing - An Array of Processes          | 122 | D130 |  |  |   |   |   |   |  | X |  |
| Additive Manufacturing - General Session                | 34  | D130 |  |  | X |   |   |   |  |   |  |
| Electron Beam Melting (EBM) I                           | 51  | D130 |  |  |   | X |   |   |  |   |  |
| Electron Beam Melting (EBM) II                          | 105 | D130 |  |  |   |   |   | X |  |   |  |
| Laser-Based AM Processes                                | 84  | D130 |  |  |   |   |   | X |  |   |  |
| Ultrasonic and Other Solid State Additive Manufacturing | 70  | D130 |  |  |   |   | X |   |  |   |  |

### Advances in Manufacturing Technologies

|                                   |    |          |  |  |   |   |   |   |  |  |  |
|-----------------------------------|----|----------|--|--|---|---|---|---|--|--|--|
| Advanced Manufacturing Techniques | 86 | D144/145 |  |  |   |   |   | X |  |  |  |
| Forming, Shaping and Issues       | 52 | D144/145 |  |  |   | X |   |   |  |  |  |
| Machining, Joining and Issues     | 71 | D144/145 |  |  |   |   | X |   |  |  |  |
| Materials and Processing          | 35 | D144/145 |  |  | X |   |   |   |  |  |  |

### Characterization and Modeling of the Performance of Advanced Alloys for

#### the Transportation Industry - Bridging the Data Gap II

|                                                                     |     |      |  |  |  |   |   |   |   |  |  |
|---------------------------------------------------------------------|-----|------|--|--|--|---|---|---|---|--|--|
| Assessing the Technical Challenges with Advanced Lightweight Alloys | 53  | D131 |  |  |  | X |   |   |   |  |  |
| Evaluating the Performance of Advanced Lightweight Alloys I         | 87  | D131 |  |  |  |   |   | X |   |  |  |
| Evaluating the Performance of Advanced Lightweight Alloys II        | 107 | D131 |  |  |  |   |   |   | X |  |  |
| Predicting the Mechanical Behavior of Advanced Lightweight Alloys   | 71  | D131 |  |  |  |   | X |   |   |  |  |

### Joining and Sustaining of Superalloys

|                                                        |     |       |  |  |  |  |  |   |   |  |  |
|--------------------------------------------------------|-----|-------|--|--|--|--|--|---|---|--|--|
| Joining and Sustaining of Ni-Base Superalloys: Part I  | 96  | E161A |  |  |  |  |  | X |   |  |  |
| Joining and Sustaining of Ni-Base Superalloys: Part II | 113 | E161A |  |  |  |  |  |   | X |  |  |

### Joining of Advanced and Specialty Materials (JASM XIII)

|                                       |     |       |  |  |   |   |   |   |   |   |  |
|---------------------------------------|-----|-------|--|--|---|---|---|---|---|---|--|
| Micro and Nano Joining I              | 96  | E161B |  |  |   |   |   | X |   |   |  |
| Micro and Nano Joining II             | 114 | E161B |  |  |   |   |   |   | X |   |  |
| Solid State Joining                   | 43  | E161B |  |  | X |   |   |   |   |   |  |
| Welding Consumables                   | 61  | E161B |  |  |   | X |   |   |   |   |  |
| Welding Metallurgy                    | 77  | E161B |  |  |   |   | X |   |   |   |  |
| Welding Technologies and Applications | 129 | E161B |  |  |   |   |   |   |   | X |  |

### Laser Applications in Materials Technology (II)

|                                                                         |    |       |  |  |   |   |  |  |  |  |  |
|-------------------------------------------------------------------------|----|-------|--|--|---|---|--|--|--|--|--|
| Laser Materials Processing                                              | 43 | E161A |  |  | X |   |  |  |  |  |  |
| Mechanical Properties of Additive Manufactured Materials and Components | 62 | E161A |  |  |   | X |  |  |  |  |  |

### Microwave Processing of Materials

|                      |     |      |  |  |  |  |  |  |   |   |   |
|----------------------|-----|------|--|--|--|--|--|--|---|---|---|
| Session I            | 116 | C221 |  |  |  |  |  |  | X |   |   |
| Session II           | 131 | C221 |  |  |  |  |  |  |   | X |   |
| Microwave Technology | 141 | C221 |  |  |  |  |  |  |   |   | X |

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|                                                                              |      |      | PM     | AM     | PM | AM      | PM | AM        | PM | AM       | PM |
| Novel Sintering Processes and News in Traditional Sintering and Grain Growth |      |      |        |        |    |         |    |           |    |          |    |
| Energetics and Fundaments of NanoSintering                                   | 46   | C222 |        |        | X  |         |    |           |    |          |    |
| Field Assisted and NanoSintering I                                           | 65   | C222 |        |        |    | X       |    |           |    |          |    |
| Field Assisted and NanoSintering II                                          | 80   | C222 |        |        |    |         | X  |           |    |          |    |
| Field Assisted and NanoSintering III                                         | 99   | C222 |        |        |    |         |    | X         |    |          |    |
| Field Assisted and NanoSintering IV                                          | 118  | C222 |        |        |    |         |    |           | X  |          |    |

#### Particulate Composites

|                            |     |      |  |  |  |  |  |   |   |  |  |
|----------------------------|-----|------|--|--|--|--|--|---|---|--|--|
| Particulate Composites I   | 99  | C115 |  |  |  |  |  | X |   |  |  |
| Particulate Composites II  | 100 | C115 |  |  |  |  |  | X |   |  |  |
| Particulate Composites III | 118 | C115 |  |  |  |  |  |   | X |  |  |

#### Surface Protection for Enhanced Materials Performance: Science and Technology

|                                                  |     |      |  |  |   |   |   |   |   |  |  |
|--------------------------------------------------|-----|------|--|--|---|---|---|---|---|--|--|
| Advanced Processing/Multi-Functional Coatings I  | 105 | D230 |  |  |   |   |   | X |   |  |  |
| Advanced Processing/Multi-Functional Coatings II | 121 | D230 |  |  |   |   |   |   | X |  |  |
| Environmental Coatings                           | 69  | D230 |  |  |   | X |   |   |   |  |  |
| Thermal Barrier Coatings                         | 83  | D230 |  |  |   |   | X |   |   |  |  |
| Wear-Resistant and Tribological Coatings         | 50  | D230 |  |  | X |   |   |   |   |  |  |

### Special Topics

#### Continuous Improvement of Academic Programs (and Satisfying ABET Along the Way): The Elizabeth Judson Memorial Symposium

|                                       |    |       |  |  |   |   |  |  |  |  |  |
|---------------------------------------|----|-------|--|--|---|---|--|--|--|--|--|
| Best Practice in Program Improvement  | 53 | E160A |  |  |   | X |  |  |  |  |  |
| The Engineering Accreditation Process | 37 | E160A |  |  | X |   |  |  |  |  |  |

#### Journal of Undergraduate Materials Research

|  |    |       |  |  |  |  |   |  |  |  |  |
|--|----|-------|--|--|--|--|---|--|--|--|--|
|  | 78 | E160A |  |  |  |  | X |  |  |  |  |
|--|----|-------|--|--|--|--|---|--|--|--|--|

#### Perspectives for Emerging Materials Professionals: Early Strategies for Career Development

|            |    |          |  |  |  |   |   |  |  |  |  |
|------------|----|----------|--|--|--|---|---|--|--|--|--|
| Session I  | 66 | B200/201 |  |  |  | X |   |  |  |  |  |
| Session II | 80 | B200/201 |  |  |  |   | X |  |  |  |  |

#### ACerS Richard M. Fulrath Award Symposium

|  |    |          |  |  |   |  |  |  |  |  |  |
|--|----|----------|--|--|---|--|--|--|--|--|--|
|  | 34 | C113/114 |  |  | X |  |  |  |  |  |  |
|--|----|----------|--|--|---|--|--|--|--|--|--|

#### Student Career Development

|  |    |      |  |  |   |  |  |  |  |  |  |
|--|----|------|--|--|---|--|--|--|--|--|--|
|  | 49 | C213 |  |  | X |  |  |  |  |  |  |
|--|----|------|--|--|---|--|--|--|--|--|--|

### General Poster Session

|                                                |     |            |  |  |  |   |   |   |   |  |  |
|------------------------------------------------|-----|------------|--|--|--|---|---|---|---|--|--|
| Biomaterial Technology (001-030)               | 145 | Ex. Hall C |  |  |  | X | X | X | X |  |  |
| Ceramic and Glass Materials (031-069)          | 146 | Ex. Hall C |  |  |  | X | X | X | X |  |  |
| Electronic and Magnetic Materials (070-090)    | 147 | Ex. Hall C |  |  |  | X | X | X | X |  |  |
| Environmental and Energy Issues (091-097)      | 148 | Ex. Hall C |  |  |  | X | X | X | X |  |  |
| Fundamentals and Characterization (098-135)    | 148 | Ex. Hall C |  |  |  | X | X | X | X |  |  |
| Iron and Steel (136-149)                       | 149 | Ex. Hall C |  |  |  | X | X | X | X |  |  |
| Materials-Environment Interactions (150-163)   | 150 | Ex. Hall C |  |  |  | X | X | X | X |  |  |
| Materials Performance (164-186)                | 150 | Ex. Hall C |  |  |  | X | X | X | X |  |  |
| Nanotechnology (187-217)                       | 151 | Ex. Hall C |  |  |  | X | X | X | X |  |  |
| Processing and Product Manufacturing (218-252) | 152 | Ex. Hall C |  |  |  | X | X | X | X |  |  |

## ACerS Frontiers of Science and Society Rustum Roy Lecture

Sunday PM  
October 16, 2011  
Room: C113/114  
Location: Columbus Con. Center

### 5:00 PM

**Reinventing Manufacturing to Answer New Global Challenges and Market Opportunity:** *Deborah Wince-Smith*<sup>1</sup>; <sup>1</sup>Council on Competitiveness

## MS&T'11 Opening Plenary Session: Grasping Excellence: Opportunities for Science and Engineering Research, Education and Workforce Development in the United States

Monday AM  
October 17, 2011  
Room: Ballroom I & II  
Location: Columbus Con. Center

### 8:30 AM Introductory Comments

### 8:35 AM Plenary

**Innovation Ecosystems: Where do we go from here?:** *Subra Suresh*<sup>1</sup>; <sup>1</sup>Massachusetts Institute of Technology (MIT)

### 9:15 AM Plenary

**Taking a Scientific Approach to Learning and Teaching STEM:** *Carl E. Wieman*<sup>1</sup>; <sup>1</sup>Associate Director for Science, Office of Science and Technology Policy, The White House

### 10:00 AM Break

### 10:20 AM Plenary

**Responding to Increasing Energy, Environmental, Health and National Security Challenges – Investment, Policy and Talent Issues:** *Jeffrey Wadsworth*<sup>1</sup>; <sup>1</sup>Battelle Memorial Institute

### 10:55 AM Plenary

**Talent Challenges in Aerospace and Defense:** *Alton Romig*<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

### 11:25 AM Question and Answer Period

## ACerS Richard M. Fulrath Award Symposium

*Program Organizer:* Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center

Monday PM  
October 17, 2011  
Room: C113/114  
Location: Columbus Con. Center

### 2:00 PM

**Japanese Academic: Improvements in Reliability of Ceramics:** *Junichi Tatami*<sup>1</sup>; <sup>1</sup>Yokohama National University

### 2:40 PM

**Japanese Industrial: Research and Development of Microwave Dielectric with Low Loss and Novel ZnO-Based Ceramic Varistor Material:** *Eiichi Koga*<sup>1</sup>; <sup>1</sup>Panasonic

### 3:00 PM

**American Industrial: Porous Ceramics Materials for Clean Air Technologies:** *Sujanto Widjaja*<sup>1</sup>; <sup>1</sup>Corning Inc.

### 3:20 PM Break

### 3:40 PM

**Japanese Industrial 2: Low Thermal Expansion Materials:** *Atsushi Omote*<sup>1</sup>; <sup>1</sup>Panasonic

### 4:00 PM

**American Academic: Two Photon Polymerization of Inorganic-Organic Hybrid Materials for Medical Applications:** *Roger Narayan*<sup>1</sup>; <sup>1</sup>University of North Carolina and North Carolina State University

## Additive Manufacturing of Metals: Additive Manufacturing - General Session

*Program Organizers:* Ian D. Harris, EWI; Ulf Ackelid, Arcam AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, Ohio State University; Brent Stucker, University of Louisville

Monday PM  
October 17, 2011  
Room: D130  
Location: Columbus Con. Center

*Session Chair:* Ian Harris, EWI

### 2:00 PM

**Overview, History and Current Processes for Metal Additive Manufacturing:** *David Bourell*<sup>1</sup>; <sup>1</sup>University of Texas

### 2:40 PM

**Additive Manufacturing of Nickel-Base Superalloys: Comparing Electron Beam Melting and Laser Melting:** *Medina Francisco*<sup>1</sup>; Krista Amato<sup>1</sup>; John Wooten<sup>2</sup>; Shane Collins<sup>3</sup>; Larry Murr<sup>1</sup>; Ulf Ackelid<sup>4</sup>; Ryan Wicker<sup>1</sup>; <sup>1</sup>UTEP; <sup>2</sup>CalRAM; <sup>3</sup>Directed Manufacturing Inc; <sup>4</sup>Arcam AB

### 3:00 PM

**Additive Manufacturing/Direct Digital Manufacturing: An Aerospace Perspective and Assessment of the Domestic Supply Base:** *Stephen Szaruga*<sup>1</sup>; Howard Sizek<sup>1</sup>; Kevin Hartke<sup>2</sup>; Larry Dosser<sup>2</sup>; <sup>1</sup>Air Force Research Laboratory; <sup>2</sup>Mound Laser & Photonics Center

### 3:20 PM Break

### 3:40 PM

**Economic Model and Analysis of Cost Effectiveness of Rapid Manufacturing:** *Guha Prasanna Manogharan*<sup>1</sup>; Ola Harrysson<sup>1</sup>; Richard Wysk<sup>1</sup>; <sup>1</sup>NCSU

### 4:00 PM

**3D-Printing as Manufacturing Method:** *Thomas Studnitzky*<sup>1</sup>; <sup>1</sup>Fraunhofer

### 4:20 PM

**Additive Manufacturing of Metals: A Review:** *Edward Herderick*<sup>1</sup>; <sup>1</sup>EWI

### 4:40 PM

**Microstructure Control and Mechanical Properties Assessment of Additive Manufacture Ti6Al4V by TIG Welding Process:** *Fude Wang*<sup>1</sup>; Stewart Williams<sup>1</sup>; <sup>1</sup>Cranfield University

### 5:00 PM

**Microstructure, Wear and Corrosion Properties of Nickel-Based Carbide-Metal Matrix Composite Coating Formed by Direct Metal Laser Deposition:** *Samar Kalita*<sup>1</sup>; <sup>1</sup>University of North Dakota

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## Advanced Protective Coatings for Refractory Metals and Alloys: Recent Development in Oxidation Resistant Refractory Metal Alloys, Composites and Protective Coating Materials I

Program Organizers: Ridwan Sakidja, University of Wisconsin-Madison; Brian Cockram, Bechtel-Bettis

Monday PM  
October 17, 2011  
Room: D231  
Location: Columbus Con. Center

Funding support provided by: WARF (Wisconsin Alumni Research Foundation)

Session Chair: Matthew Kramer, Ames National Laboratory

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### 2:00 PM Invited

**Balancing the Properties of Structural Mo-Borosilicide Alloys for Ultra-High Temperature Applications:** Martin Heilmair<sup>1</sup>; Manja Krueger<sup>2</sup>; Heinrich Kestler<sup>3</sup>; Steffen Burk<sup>4</sup>; H.J. Christ<sup>4</sup>; <sup>1</sup>TU Darmstadt; <sup>2</sup>Otto-von-Guericke University Magdeburg; <sup>3</sup>Plansee SE; <sup>4</sup>Universität Siegen

### 2:40 PM Invited

**Oxidation Resistance of Nb Based Alloys from 700 to 1400°C in Air:** Shailendra Varma<sup>1</sup>; <sup>1</sup>The University of Texas at El Paso

### 3:20 PM Break

### 3:40 PM Invited

**Mo-Mo<sub>2</sub>B-Silicate Composites, Mechanics and Oxidation:** Joe Cochran<sup>1</sup>; William Daloz<sup>1</sup>; Peter Marshall<sup>1</sup>; <sup>1</sup>Georgia Institute of Technology

### 4:20 PM

**Influence of Minor Element Addition on the Oxidation Performance of Mo-Si-B Alloys:** Travis Sossaman<sup>1</sup>; Ridwan Sakidja<sup>1</sup>; John Perepezko<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

### 4:40 PM

**Low Temperature Oxidation Behavior of Niobium Alloys:** Rabindra Mahapatra<sup>1</sup>; M. A. Imam<sup>2</sup>; S. K. Varma<sup>3</sup>; C. E. Feng<sup>2</sup>; C. E. Lei<sup>1</sup>; <sup>1</sup>NAVAIR; <sup>2</sup>Naval Research Laboratory; <sup>3</sup>UTEP

### 5:00 PM

**Thermal Cycling Behavior of Gd<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> Based Thermal Barrier Coatings:** Li Wang<sup>1</sup>; Swamy Nandikolla<sup>2</sup>; M. Hamed Habibi<sup>1</sup>; Patrick F. Mensah<sup>2</sup>; Ravinder Diwan<sup>2</sup>; S.M. Guo<sup>1</sup>; <sup>1</sup>Louisiana State University and A&M College; <sup>2</sup>Southern University and A&M College

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## Advances in Dielectric Materials and Electronic Devices: Materials Synthesis, Preparation and Processing

Program Organizer: K. M. Nair, E.I.duPont de Nemours & Co, Inc

Monday PM  
October 17, 2011  
Room: C220  
Location: Columbus Con. Center

Session Chairs: X Chen, Zhejiang University; D Sinclair, University of Sheffield

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### 2:00 PM Invited

**Novel Dielectric Materials through Novel Powder Processing:** Marija Kosec<sup>1</sup>; Tadej Rojac<sup>1</sup>; Barbara Malic<sup>1</sup>; Sebastjan Glinšek<sup>1</sup>; <sup>1</sup>Jožef Stefan Institute

### 2:20 PM Invited

**Synthesis and Sintering of Nanopowders:** Dragan Uskokovic<sup>1</sup>; <sup>1</sup>Institute of Technical Sciences of the Serbian Academy of Sciences and Arts

### 2:40 PM

**Dielectric and Ferroelectric Analysis of Nanoparticle/Nanocrystalline Barium Titanate and PLZT:** Christopher DiAntonio<sup>1</sup>; Todd Monson<sup>1</sup>; Michael Winter<sup>1</sup>; Alex Roesler<sup>1</sup>; Tom Chavez<sup>1</sup>; Pin Yang<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

### 3:00 PM

**Ceramic Relaxor Ferroelectrics with Giant Electrocaloric Effect for Dielectric Refrigeration:** Zdravko Kutnjak<sup>1</sup>; Brigita Rozic<sup>1</sup>; Barbara Malic<sup>1</sup>; Hana Ursic<sup>1</sup>; Janez Holc<sup>1</sup>; Marija Kosec<sup>1</sup>; <sup>1</sup>Jozef Stefan Institute

### 3:20 PM Break

### 3:40 PM Invited

**Novel Material and Application Based on Garnet-Type Single Crystals:** Kiyoshi Shimamura<sup>1</sup>; Encarnación G. Villora<sup>1</sup>; Noboru Ichinose<sup>2</sup>; <sup>1</sup>National Institute for Materials Science; <sup>2</sup>Waseda University

### 4:00 PM

**Synthesis and Properties of Polymer-Derived Amorphous SiBCN Ceramics:** Yaohan Chen<sup>1</sup>; Linan An<sup>1</sup>; <sup>1</sup>AMPAC-UCF

### 4:20 PM

**Evolution of Microstructures Due to Additives and Processing:** Narsingh Singh<sup>1</sup>; David Knuteson<sup>1</sup>; Andre Berghmans<sup>1</sup>; David Kahler<sup>1</sup>; John Talvacchio<sup>1</sup>; Michael House<sup>1</sup>; Benjamine Schreib<sup>1</sup>; Sean McLaughlin<sup>1</sup>; Brian Wagner<sup>1</sup>; Matthew King<sup>1</sup>; <sup>1</sup>Northrop Grumman Corporation

### 4:40 PM

**Dielectric Property of Polymer-Derived SiAlCN Ceramics:** Gang Shao<sup>1</sup>; Linan An<sup>1</sup>; <sup>1</sup>university of central florida

### 5:00 PM Invited

**High Performance Nano BaTiO<sub>3</sub> Based Ceramics for Next Generation MLCC Prepared by Chemical Coating Method:** Xiaohui Wang<sup>1</sup>; <sup>1</sup>Tsinghua University

### 5:20 PM

**Freeze Tape-Casting of Dielectric Composites:** Edward Gorzkowski<sup>1</sup>; Barry Bender<sup>1</sup>; Ming-Jen Pan<sup>1</sup>; <sup>1</sup>US Naval Research Lab

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## Advances in Manufacturing Technologies: Materials and Processing

Program Organizer: Muammer Koc, Istanbul Sehir University

Monday PM  
October 17, 2011  
Room: D144/145  
Location: Columbus Con. Center

Session Chair: Omer Cora, KTU / VCU

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### 2:00 PM

**A Study on the Fracture Mechanism of Poly Crystalline Silicon in the Soldering Process of Photovoltaic Module:** Lee sang-ek<sup>1</sup>; Park tae-dong<sup>1</sup>; Lee hea-tae<sup>1</sup>; Hur tae-young<sup>1</sup>; <sup>1</sup>Hyunday Heavy Industries

### 2:20 PM

**Determination of Mechanical Properties of Friction Stir Welded Alloys through Uniaxial and Indentation Tests:** Hasan Gedikli<sup>1</sup>; Ömer Cora<sup>2</sup>; Muammer Koc<sup>2</sup>; <sup>1</sup>Karadeniz Technical University; <sup>2</sup>Virginia Commonwealth University

### 2:40 PM

**Modeling of Grain Refinement in Aluminum and Copper Subjected to Cutting:** Hongtao Ding<sup>1</sup>; Ninggang Shen<sup>1</sup>; Yung Shin<sup>1</sup>; <sup>1</sup>Purdue University

## 3:00 PM Break

### 3:20 PM

**Residual Stress and Microstructure Characterisation of Flow Formed Steel:** *Ceylan Kubilay*<sup>1</sup>; Michael Preuss<sup>1</sup>; Martin Tuffs<sup>2</sup>; Wayne Voice<sup>2</sup>; <sup>1</sup>University of Manchester; <sup>2</sup>Rolls-Royce plc

### 3:40 PM

**The Effect of Casting Speed on the Microstructure and Mechanical Behavior of AZ31 Magnesium Alloy Produced by Twin-Roll Strip Casting:** *Jaesin Park*<sup>1</sup>; Kiho Yun<sup>1</sup>; Deok Kim<sup>1</sup>; Jae Joong Kim<sup>1</sup>; Woo-jin Park<sup>1</sup>; Dongkyun Choo<sup>1</sup>; <sup>1</sup>RIST

### 4:00 PM

**Modeling of the Bauschinger Effect and Springback in Dual-Phase Steels:** Jin Woo Lee<sup>1</sup>; Jeong Yeon Lee<sup>1</sup>; Myoung-Gyu Lee<sup>1</sup>; *Frederic Barlat*<sup>1</sup>; <sup>1</sup>Pohang University of Science and Technology

### 4:40 PM

**Study of Al-B-Si Thin Films Deposited over Polymer Substrate via Sputtering:** *Glorimar Ramos*<sup>1</sup>; Oscar Suárez<sup>1</sup>; <sup>1</sup>University of Puerto Rico-Mayaguez Campus

## ASM Alpha Sigma Mu Lecture

Monday PM  
October 17, 2011  
Room: D131  
Location: Columbus Con. Center

### 3:00 PM

**Technical Challenges of Commercial Aircraft Wheels and Brakes:** *Charles Parker*<sup>1</sup>; <sup>1</sup>Honeywell International Inc

## Beyond Property Measurement -- Mechanical Behavior of Multifunctional Materials Systems: Mechanical Characterization across Multifunctional Systems

*Program Organizer:* Andrew Gouldstone, Northeastern University

Monday PM  
October 17, 2011  
Room: C212  
Location: Columbus Con. Center

*Session Chair:* Andrew Gouldstone, Northeastern University

### 2:00 PM Introductory Comments

### 2:20 PM

**An Ultra Strength Multifunctional Nanocomposites Enhanced by Ionic Liquid Functional Carbon Nanotubes:** *zhe wang*<sup>1</sup>; Hansang Kim<sup>1</sup>; Tomas Hahn<sup>1</sup>; <sup>1</sup>UCLA

### 2:40 PM

**Applicability of Scratch Testing in Evaluation of Mechanical Behaviour of Thick WC-Based Thermally Sprayed Coatings:** *Arash Ghabchi*<sup>1</sup>; Kenneth Holmberg<sup>2</sup>; Sanjay Sampath<sup>1</sup>; <sup>1</sup>SUNY, Stony Brook; <sup>2</sup>Technical Research Center of Finland(VTT)

### 3:00 PM

**Research on the Mechanism of Damping Attenuation Behavior of Alloys:** Shuwei Liu<sup>1</sup>; Xiaofeng Hu<sup>1</sup>; Haichang Jiang<sup>1</sup>; Lijian Rong<sup>1</sup>; Yiyi Li<sup>1</sup>; <sup>1</sup>Institute of Metal Research, Chinese Academy Sciences

## 3:20 PM Break

### 3:40 PM

**Mechanical Reliability Study on Porous Brittle Materials:** *Xiaofeng Fan*<sup>1</sup>; Eldon Case<sup>1</sup>; Fei Ren<sup>2</sup>; Yutian Shu<sup>1</sup>; Melissa Baumann<sup>1</sup>; <sup>1</sup>Michigan State University; <sup>2</sup>Oak Ridge National Laboratory

### 4:00 PM

**Microstructure and Mechanical Behavior of Eutectic Fe<sub>30</sub>Ni<sub>20</sub>Mn<sub>35</sub>Al<sub>15</sub> Alloy:** *Fanling Meng*<sup>1</sup>; Ian Baker<sup>1</sup>; Yifeng Liao<sup>2</sup>; <sup>1</sup>dartmouth college; <sup>2</sup>Northwestern University

### 4:20 PM

**Nanocantilever Testing of U-10Mo/Zr/Al Interfaces for Fuel Assemblies:** *Thomas Wynn*<sup>1</sup>; Patricia Dickerson<sup>1</sup>; Kester Clarke<sup>1</sup>; David Dombrowski<sup>1</sup>; Nathan Mara<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

### 4:40 PM

**Slow Growth of Microcracks in Hydroxyapatite Introduced by Vickers Indentation:** *Yutian Shu*<sup>1</sup>; Eldon Case<sup>1</sup>; Melissa Baumann<sup>1</sup>; <sup>1</sup>Michigan State University

### 5:00 PM

**Measurement of Anisotropic Elastic Constants Using Laser Generated Surface Acoustic Waves:** *Peng Zhao*<sup>1</sup>; Changdong Wei<sup>1</sup>; Ji-Cheng Zhao<sup>1</sup>; <sup>1</sup>Ohio State University

### 5:20 PM Concluding Comments

### 5:30 PM Cancelled

**Development of Thin Film Li-Ion Battery Embedded Multifunctional Energy Storage Composite Structure:** *Jin Kang*<sup>1</sup>; Hak Kim<sup>2</sup>; Thomas Hahn<sup>1</sup>; <sup>1</sup>University of California, Los Angeles; <sup>2</sup>Hanyang University

## Ceramic Matrix Composites: CMC Applications

*Program Organizers:* Narottam Bansal, NASA Glenn Research Center; J. P. Singh, U.S. Army Research Laboratory; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Monday PM  
October 17, 2011  
Room: C112  
Location: Columbus Con. Center

*Session Chairs:* Monica Ferraris, Politecnico di Torino; Narottam Bansal, NASA Glenn Research Center

### 2:00 PM Invited

**Aerospace and Industrial Applications of C/C, C/SiC, SiC/SiC Composites at SPS:** *Patrick SPRIET*<sup>1</sup>; <sup>1</sup>SAFRAN

### 2:40 PM Invited

**Aircraft Brake Friction Materials:** *Peter Filip*<sup>1</sup>; <sup>1</sup>Southern Illinois University Carbondale

### 3:20 PM Break

### 3:40 PM Invited

**Integration and Joining of CMCs:** *Monica Ferraris*<sup>1</sup>; <sup>1</sup>Politecnico di Torino

### 4:20 PM Invited

**Fibrous Ceramic Materials in UBE:** *Toshihiro Ishikawa*<sup>1</sup>; <sup>1</sup>Ube Industries, Ltd.

### 5:00 PM

**SynFoam Structural Insulators:** *Brian Doud*<sup>1</sup>; <sup>1</sup>Powdermet Inc.

## Continuous Improvement of Academic Programs (and Satisfying ABET Along the Way): The Elizabeth Judson Memorial Symposium: The Engineering Accreditation Process

Program Organizer: Jeffrey Fergus, Auburn University

Monday PM Room: E160A  
October 17, 2011 Location: Columbus Con. Center

Session Chairs: Janet Callahan, Boise State University; Jeffrey Fergus, Auburn University

### 2:00 PM Introductory Comments Jeffrey W. Fergus

#### 2:20 PM Keynote

ABET's Perspective on CQI, Innovation, and the Accreditation Process: Michael Milligan<sup>1</sup>; <sup>1</sup>ABET, Inc.

#### 3:00 PM

Engineering Accreditation: Not Such a Mysterious Process after All: Gillian Bond<sup>1</sup>; <sup>1</sup>New Mexico Tech

#### 3:20 PM Break

#### 3:40 PM Invited

The Role of Societies in the Accreditation Process: Steve Yalisove<sup>1</sup>; <sup>1</sup>University of Michigan

#### 4:00 PM Invited

International Accreditation of Engineering Programs by ABET: Chester Van Tyne<sup>1</sup>; <sup>1</sup>Colorado School of Mines

#### 4:20 PM

Program Evaluators – The Key to an Effective and Consistent Accreditation Process: Jeffrey Fergus<sup>1</sup>; <sup>1</sup>Auburn University

#### 4:40 PM Invited

ABET Visit Preparation from the Perspective of a Program Evaluator: Carl Boehlert<sup>1</sup>; <sup>1</sup>Michigan State University

## Controlled Synthesis, Processing and Applications of Structural and Functional Nanomaterials: Zero Dimension Nanomaterials

Program Organizers: Kathy Lu, Virginia Tech; Xudong Wang, University of Wisconsin - Madison; Eugene Olevsky, San Diego State University; Gurpreet Singh, Kansas State University; Nitin Chopra, The University of Alabama; Pu-Xian Gao, University of Connecticut; Jianyu Liang, Worcester Polytechnic Institute

Monday PM Room: C123  
October 17, 2011 Location: Columbus Con. Center

Session Chair: Eugene Olevsky, San Diego State University

#### 2:00 PM

Heterostructured Powders for Photocatalytic Hydrogen Production: Nanostructured TiO<sub>2</sub> Shells Surrounding Microcrystalline (Ba,Sr)TiO<sub>3</sub> Cores: Li Li<sup>1</sup>; Paul Salvador<sup>1</sup>; Gregory Rohrer<sup>1</sup>; <sup>1</sup>CMU

#### 2:20 PM

Micro- and Nano-Structures of I-III-VI<sub>2</sub>-Based Materials Prepared via Solvothermal Processes: Balamurugan Karuppannan<sup>1</sup>; Jacqueline Sturgeon<sup>2</sup>; Johanna Burnett<sup>1</sup>; Kristin Bunker<sup>2</sup>; Karen Harris<sup>2</sup>; Jennifer Aitken<sup>1</sup>; <sup>1</sup>Duquesne University; <sup>2</sup>RJ Lee Group

#### 2:40 PM

Nanoparticle Formation Utilizing the Interaction of Femtosecond Laser Pulses with Interfaces: Ryan Murphy<sup>1</sup>; Michael Abere<sup>1</sup>; Ben Torralva<sup>1</sup>; Steven Yalisove<sup>1</sup>; <sup>1</sup>University of Michigan

#### 3:00 PM

Structural Analysis on the Quantum Dots (CdSe/ZnS) Using Ab-Initio Calculations: Lan Hee Yang<sup>1</sup>; Sangil Hyun<sup>1</sup>; Eunhae Koo<sup>1</sup>; <sup>1</sup>Korea Institute of Ceramic Engineering & Technology

#### 3:20 PM Break

#### 3:40 PM

Synthesis of Fe<sub>3</sub>O<sub>4</sub>/SiO<sub>2</sub> Core-shell Structured Microspheres for Biomedical Applications: Zheng Ren<sup>1</sup>; Puxian Gao<sup>1</sup>; <sup>1</sup>University of Connecticut

#### 4:00 PM

Synthesis and Surface Energetics of Lithium deficient LiNiO<sub>2</sub> Nanoparticles: Ricardo H. R. Castro<sup>1</sup>; Minghui Zhu<sup>1</sup>; Beibei Wang<sup>1</sup>; <sup>1</sup>University of California at Davis

#### 4:20 PM

Effect of Annealing and Transition Metal Doping on Structural, Optical and Magnetic Properties of ZnO Nanomaterial: Navendu Goswami<sup>1</sup>; <sup>1</sup>Jaypee Institute of Information Technology

#### 4:40 PM

Effect of Material Strain on Embedded Quantum Dot Fluorescence with Application to Strain Sensing: Kyle Ford<sup>1</sup>; Michael Collins<sup>1</sup>; Dominick Dowds<sup>1</sup>; Nassim Ajami<sup>1</sup>; Kevin Mantey<sup>2</sup>; Ghassan Al-Chaar<sup>1</sup>; Jonathan Trovillion<sup>1</sup>; Munir Nayfeh<sup>2</sup>; Charles Marsh<sup>1</sup>; <sup>1</sup>ERDC-CERL; <sup>2</sup>University of Illinois

#### 5:00 PM

Synthesis of Nano Cobalt by Using Liquid Phase Reduction Method and Their Characteristics: Jin ho Lee<sup>1</sup>; Se Hwan An<sup>1</sup>; Jin Woo Kim<sup>1</sup>; Young Do Kim<sup>1</sup>; <sup>1</sup>Hanyang University

## Deformation and Transitions at Grain Boundaries: Boundary Characterization Methodology

Program Organizers: Thomas Bieler, Michigan State University; Douglas Spearot, University of Arkansas; Rozaliya Barabash, Oak Ridge National Laboratory; Shen Dillon, University of Illinois at Urbana-Champaign; Jian Luo, Clemson University

Monday PM Room: C121  
October 17, 2011 Location: Columbus Con. Center

Session Chairs: T Ben Britton, University of Oxford; E-Wen Huang, National Central University

#### 2:00 PM Invited

Slip Bands and Grain Boundaries: A High Accuracy EBSD Study: T Ben Britton<sup>1</sup>; Angus Wilkinson<sup>1</sup>; <sup>1</sup>Department of Materials, University of Oxford

#### 2:20 PM

Characterization of Geometrically Necessary Dislocations near Grain Boundaries by 3D-XRD: Leyun Wang<sup>1</sup>; Rozaliya Barabash<sup>2</sup>; Philip Eisenlohr<sup>3</sup>; Martin Crimp<sup>1</sup>; Carl Boehlert<sup>1</sup>; Hongmei Li<sup>1</sup>; Thomas Bieler<sup>1</sup>; <sup>1</sup>Michigan State University; <sup>2</sup>Oak Ridge National Laboratory; <sup>3</sup>Max-Planck-Institut für Eisenforschung



## 2:40 PM Invited

**Measuring Gradients of Orientation and Deformation Using High Energy Synchrotron X-Rays:** Matthew Miller<sup>1</sup>; Ulrich Lienert<sup>2</sup>; Robert Suter<sup>3</sup>; Joel Bernier<sup>4</sup>; Nathan Barton<sup>4</sup>; Michael Mills<sup>5</sup>; *Matthew Brandes*<sup>5</sup>; <sup>1</sup>Cornell University; <sup>2</sup>Advanced Photon Source/ANL; <sup>3</sup>Carnegie Mellon University; <sup>4</sup>Lawrence Livermore National Laboratory; <sup>5</sup>The Ohio State University

## 3:00 PM Invited

**Spatially-Resolved Microdiffraction Studies of Local Grains, Strains and Phase Transitions:** *John Budai*<sup>1</sup>; Jonathan Tischler<sup>1</sup>; Alexander Tselev<sup>1</sup>; Andrei Kolmakov<sup>2</sup>; Sergei Kalinin<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>Southern Illinois University

## 3:20 PM Break

## 3:40 PM

**In-situ Observation of Damage Accumulation in Cu Wire by High Energy X-ray Diffraction Microscopy:** S. F. Li<sup>1</sup>; J. Lind<sup>2</sup>; C. Hefferan<sup>1</sup>; R. Pokharel<sup>3</sup>; A. Rollett<sup>4</sup>; U. Lienert<sup>4</sup>; R. Suter<sup>1</sup>; <sup>1</sup>Carnegie Mellon University, Department of Physics; <sup>2</sup>Carnegie Mellon University; <sup>3</sup>Carnegie Mellon University, Department of Material Science and Engineering; <sup>4</sup>Argonne National Lab, Advanced Photon Source

## 4:00 PM Invited

**Study Boundary Deformation between Matrix Grains and Nano Precipitates with Neutron Diffraction and Molecular Dynamic Simulation:** *E-Wen Huang*<sup>1</sup>; Yu-Chieh Lo<sup>2</sup>; Jer-Yi Liao<sup>1</sup>; Yu-Lih Huang<sup>1</sup>; <sup>1</sup>National Central University; <sup>2</sup>National Sun Yat-Sen University

## 4:20 PM

**Neutron Diffraction and Micromechanical Studies of Fatigue Crack Deformation Behavior and Grain Boundary Damage:** *Yanfei Gao*<sup>1</sup>; Lili Zheng<sup>1</sup>; Sooyeol Lee<sup>1</sup>; Rozaliya Barabash<sup>2</sup>; Peter Liaw<sup>1</sup>; <sup>1</sup>Univ of Tennessee; <sup>2</sup>Oak Ridge National Laboratory

## Emerging Frontiers in Surface Engineering of Biomaterials : Smart Surfaces, Nano Structure and Systems

**Program Organizers:** Kantesh Balani, Indian Institute of Technology Kanpur; Arvind Agarwal, Florida International University; Sandip Harimkar, Oklahoma State University; Winston Soboyejo, Princeton University

Monday PM Room: C226  
October 17, 2011 Location: Columbus Con. Center

**Session Chairs:** Arvind Agarwal, Florida International University; Kantesh Balani, Indian Institute of Technology Kanpur

## 2:00 PM Keynote

**Biomimetics: Lessons from Nature:** *Bharat Bhushan*<sup>1</sup>; <sup>1</sup>The Ohio State University

## 2:40 PM

**Wettability Control of Surfaces Using Roll-to-Roll Nanoimprint Lithography (R2RNIL):** *John Clay*<sup>1</sup>; Jeff Ellis<sup>1</sup>; <sup>1</sup>Battelle Memorial Institute

## 3:00 PM

**Surface Constructions of Nano-Micro Nest-Like Structured CaP Biomaterials and Their Biocompatibility:** *Changjian Lin*<sup>1</sup>; Ren Hu<sup>1</sup>; Liwen Lin<sup>1</sup>; Longxiang Lin<sup>1</sup>; <sup>1</sup>Xiamen University

## 3:20 PM Break

## 3:40 PM Invited

**Hybrid Hydrogel Systems Comprised of Nanoscale Heterostructures as a Multi-Functional Chemical and Biological Platforms:** *Nitin Chopra*<sup>1</sup>; <sup>1</sup>The University of Alabama

## 4:20 PM

**Surface Modification Methods to Hollow Fiber Membranes of Artificial Lung: Layer Wise Heparin-Complex and Albumin-Heparin Coatings:** *Narayana Garimella*<sup>1</sup>; Tao Zhang<sup>1</sup>; Bartley Griffith<sup>1</sup>; Zhongjun Wu<sup>1</sup>; <sup>1</sup>University of Maryland School of Medicine

## 4:40 PM

**Functionally Graded Hydroxyapatite-Alumina-Zirconia:** *Kantesh Balani*<sup>1</sup>; Mohd. Atif Faiz<sup>1</sup>; Pallavi Kesarwani<sup>2</sup>; K. Madhav Reddy<sup>1</sup>; Sushma Kalmodia<sup>1</sup>; Bikramjit Basu<sup>1</sup>; <sup>1</sup>Indian Institute of Technology Kanpur; <sup>2</sup>Visvesvaraya National Institute of Technology Nagpur

## 5:00 PM Cancelled

**In Situ Microvisualization of Shell Growth in Ti6Al4V Substrates:** *Douglas Hansen*<sup>1</sup>; Karolyn Hansen<sup>2</sup>; Luis Garfias-Mesias<sup>3</sup>; <sup>1</sup>University of Dayton Research Institute; <sup>2</sup>University of Dayton; <sup>3</sup>Det Norske Veritas (U.S.A.), Inc.

## 5:20 PM Concluding Comments

## Energy Conversion/Fuel Cells: System, Stack and Component Design

**Program Organizers:** Matthew Seabaugh, NexTech Materials, Ltd.; Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Meilin Liu, Georgia Institute of Technology

Monday PM Room: C224  
October 17, 2011 Location: Columbus Con. Center

**Session Chair:** To Be Announced

## 2:00 PM

**Pressurized Operation of Reversible Solid Oxide Fuel Cells:** *Stephen Gamble*<sup>1</sup>; <sup>1</sup>The University of St Andrews

## 2:20 PM

**CO<sub>2</sub> Conversion into C/CO Using ODF Electrodes with SOEC:** *Bruce Kang*<sup>1</sup>; Huang Guo<sup>1</sup>; Gulfam Iqbal<sup>1</sup>; Ayyakkanna Manivannan<sup>2</sup>; <sup>1</sup>West Virginia University; <sup>2</sup>National Energy Technology Laboratory

## 2:40 PM

**Status of NexTech's Solid Oxide Fuel Cell Technology:** *Michael Day*<sup>1</sup>; Scott Swartz<sup>1</sup>; Gene Arkenberg<sup>1</sup>; Michael Jansen<sup>1</sup>; Chad Sellers<sup>1</sup>; Josh Emerick<sup>1</sup>; <sup>1</sup>NexTech Materials, Ltd.

## 3:20 PM Break

## 3:40 PM

**Flexible Ceramic Ultra-Thin Membranes for Fuel Cells:** *John Olenick*<sup>1</sup>; Kathleen Olenick<sup>1</sup>; Tom Silverblatt<sup>1</sup>; Jeremy Panaanen<sup>1</sup>; Roman Hurny<sup>1</sup>; Chad Melvin<sup>1</sup>; <sup>1</sup>ENrG Incorporated

## 4:00 PM

**Fabrication of LSGMC-Based IT-SOFC Cells Using Aerosol Deposition:** *Joon-Hwan Choi*<sup>1</sup>; Jong-Jin Choi<sup>1</sup>; Dong-Soo Park<sup>1</sup>; Jungho Ryu<sup>1</sup>; Woon-Ha Yoon<sup>1</sup>; Byung-Dong Hahn<sup>1</sup>; Jong-Woo Kim<sup>1</sup>; Cheol-woo Ahn<sup>1</sup>; <sup>1</sup>Korea Institute of Materials Science

## 4:20 PM

**Mechanical Characterization and Modeling of Next-Generation Solid Oxide Fuel Cells and Stacks:** *Ryan Berke*<sup>1</sup>; Mark Walter<sup>1</sup>; <sup>1</sup>The Ohio State University

## 4:40 PM

**Fabrication and Evaluation of Glass-Ceramic Composite Seals for SOFC:** *Yeong-Woo Kim*<sup>1</sup>; <sup>1</sup>RIST

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## Energy Storage: Materials, Systems and Applications: Energy Storage for Transportation Applications I

*Program Organizers:* Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Terry Holesinger, Los Alamos National Laboratory; Xingbo Liu, West Virginia University; Chun Lu, Siemens Energy, Inc.

Monday PM  
October 17, 2011

Room: C223  
Location: Columbus Con. Center

*Session Chair:* Xingbo Liu, West Virginia University

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### 2:00 PM Keynote

**Energy Storage for Advanced Electric Vehicles:** *Christopher Johnson*<sup>1</sup>; David Howell<sup>2</sup>; <sup>1</sup>National Energy Technology Laboratory, Department of Energy; <sup>2</sup>Office of Energy Efficiency and Renewable, Department of Energy

### 2:40 PM Invited

**Integrating SOC Dependent Material Properties into Li-Ion Battery Failure Modeling:** *Yue Qi*<sup>1</sup>; <sup>1</sup>General Motors R&D

### 3:20 PM Break

### 3:40 PM

**A Phase Field Study of Intercalation Dynamics in the Storage Electrode Materials of Li-Ion Battery:** *Saswata Bhattacharya*<sup>1</sup>; Linyun Liang<sup>1</sup>; Gerbrand Ceder<sup>2</sup>; Long-Qing Chen<sup>1</sup>; <sup>1</sup>Pennsylvania State University; <sup>2</sup>Massachusetts Institute of Technology

### 4:00 PM

**Phase Field Model of Li-Plating in Lithium Ion Battery:** *Linyun Liang*<sup>1</sup>; Saswata Bhattacharya<sup>1</sup>; Yue Qi<sup>2</sup>; Stephen J. Harris<sup>2</sup>; Long-Qing Chen<sup>1</sup>; <sup>1</sup>The Pennsylvania State University; <sup>2</sup>General Motors Research and Development Center

### 4:20 PM

**Electrochemical Charge/Discharge Behavior of Li-Mg Alloy Anodes for High Capacity Lithium Batteries:** *Madhusudan Jagannathan*<sup>1</sup>; K. S. Ravi Chandran<sup>1</sup>; <sup>1</sup>University of Utah

### 4:40 PM

**Aligned TiO<sub>2</sub> Nanotubes as Long Durability Anodes for Lithium-Ion Batteries:** *Juchuan Li*<sup>1</sup>; Qingliu Wu<sup>1</sup>; Rutooj Deshpande<sup>1</sup>; Navaladian Subramanian<sup>1</sup>; Stephen Rankin<sup>1</sup>; Fuqian Yang<sup>1</sup>; Yang-Tse Cheng<sup>1</sup>; <sup>1</sup>University of Kentucky

### 5:00 PM

**Understanding Diffusion-Induced-Stresses in Lithium Ion Battery Electrodes:** *Rutooj Deshpande*<sup>1</sup>; Yang Cheng<sup>1</sup>; Mark Verbrugge<sup>2</sup>; <sup>1</sup>University Of Kentucky; <sup>2</sup>General Motors Global R&D Center

### 5:20 PM Cancelled

**Nanostructured Metals and Metal Oxides for High Capacity Anodes of Li-Ion Rechargeable Batteries:** *Ming Au*<sup>1</sup>; Thad Adams<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

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## Environmentally Assisted Cracking of Materials: Session I

*Program Organizers:* Ramgopal Thodla, DNV Columbus; Suresh Divi, TIMET

Monday PM  
October 17, 2011

Room: D233  
Location: Columbus Con. Center

*Session Chair:* Suresh Divi, TIMET

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### 2:00 PM

**Environmental Cracking Resistance of High Nickel Alloys (CRAs) in Hostile Sour Environments:** *Indranil Roy*<sup>1</sup>; Mauricio Mendez<sup>2</sup>; Colin Longfield<sup>1</sup>; Rashmi Bhavsar<sup>1</sup>; Manuel Marya<sup>1</sup>; Farghalli Mohamed<sup>3</sup>; <sup>1</sup>Schlumberger; <sup>2</sup>Exova; <sup>3</sup>University of California

### 2:20 PM

**Modified 13Cr Tubulars in Sour Oil and Gas Service – Known Unknowns:** *John Meng*<sup>1</sup>; Brian Chambers<sup>1</sup>; Mark Yunovich<sup>1</sup>; <sup>1</sup>Honeywell Corrosion Solutions

### 2:40 PM

**Stress Corrosion Cracking Observation in API G-105 Grade Drill Pipe Steel at 125-175 °C in CO<sub>2</sub> Containing Environment:** Arshad Bajvani Gavanluei<sup>1</sup>; *Faisal Al-Abbas*<sup>1</sup>; Brajendra Mishra<sup>1</sup>; David Olson<sup>1</sup>; <sup>1</sup>Colorado School of Mines

### 3:00 PM

**Hydrogen-Assisted Fracture of 21Cr-6Ni-9Mn Stable Austenitic Stainless Steel:** *Chris San Marchi*<sup>1</sup>; Heather Jackson<sup>1</sup>; Jay Foulk<sup>1</sup>; Richard Karnesky<sup>1</sup>; Brian Somerday<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

### 3:20 PM Break

### 3:40 PM

**Hydrogen Dragging and Transportation by Moving Dislocation in 316L and 304 Stainless Steel:** *Megumi Kitamura*<sup>1</sup>; Hiroshi Suzuki<sup>1</sup>; Kenichi Takai<sup>1</sup>; Yukito Hagihara<sup>1</sup>; <sup>1</sup>Sophia University

### 4:00 PM

**Hydrogen Embrittlement and Lattice Defect Formation Enhanced by Hydrogen and Strain of High-strength Low-alloy Steel:** *Tomoyuki Nakamoto*<sup>1</sup>; Hiroshi Suzuki<sup>1</sup>; Kenichi Takai<sup>1</sup>; Yukito Hagihara<sup>1</sup>; Koichi Takasawa<sup>2</sup>; <sup>1</sup>Sophia University; <sup>2</sup>The Japan Steel Works, Ltd., Muroran Research Laboratory

### 4:20 PM

**Hydrogen Hardening Effect in Heavily Deformed Single Crystal  $\alpha$ -Iron:** *wenbo xie*<sup>1</sup>; Weixing Chen<sup>1</sup>; Hao Zhang<sup>1</sup>; <sup>1</sup>University of Alberta

### 4:40 PM

**Hydrogen Interactions with Austenite in Pre-Strained TRIP Steel:** *Joseph Ronevich*<sup>1</sup>; John Speer<sup>1</sup>; George Krauss<sup>1</sup>; David Matlock<sup>1</sup>; <sup>1</sup>Colorado School of Mines

### 5:00 PM

**Interpretation of Crack Initiation and Crack Arrest Fracture Threshold Measurements for Steels in High-Pressure Hydrogen Gas:** *Kevin Nibur*<sup>1</sup>; Brian Somerday<sup>2</sup>; Petros Sofronis<sup>3</sup>; Chris San Marchi<sup>2</sup>; <sup>1</sup>Hy-Peformance Materials Testing, LLC.; <sup>2</sup>Sandia National Laboratory; <sup>3</sup>University of Illinois at Urbana-Champaign

### 5:20 PM

**On Modeling Hydrogen-Induced Intergranular Cracking under Sustained-Load:** *Mohsen Dadfarnia*<sup>1</sup>; Petros Sofronis<sup>1</sup>; Brian Somerday<sup>2</sup>; D. Balch<sup>2</sup>; Philip Schembri<sup>3</sup>; <sup>1</sup>University of Illinois Urbana-Champaign; <sup>2</sup>Sandia National Laboratories; <sup>3</sup>Los Alamos National Laboratory



## Failure Analysis and Prevention: Tools and Techniques

**Program Organizers:** Andrew Spowage, The University of Nottingham, Malaysia Campus; Tom Ackerson, IMR Metallurgical Services; Larry Hanke, Materials Evaluation and Engineering, Inc

Monday PM                      Room: D235  
October 17, 2011              Location: Columbus Con. Center

**Session Chairs:** Craig Clauser, Craig Clauser Engineering Consulting, Inc.; Charles White, Kettering University; Chirag Shah, Exova

**2:00 PM**

**Quantitative Elemental Analysis in the SEM with the Silicon Drift Detector (SDD) at the Precision and Accuracy of Wavelength Dispersive Spectrometry (WDS):** *Dale Newbury*<sup>1</sup>; <sup>1</sup>National Institute of Standards and Technology

**2:40 PM**

**The Use of Micro-X-ray Fluorescence in a Scanning Electron Microscope for Failure Analysis Investigations:** *Daniel DeMiglio*<sup>1</sup>; <sup>1</sup>Stork Herron Testing Laboratories

**3:00 PM**

**The VHX-1000 Digital Microscope:** *Julia Des Chenes*<sup>1</sup>; <sup>1</sup>Keyence Corporation

**3:20 PM Break**

**3:40 PM**

**The Latest Advancements in Industrial 2D Digital X-ray and 3D Computed Tomography:** *Wes Wren*<sup>1</sup>; <sup>1</sup>North Star Imaging, Inc.

**4:20 PM**

**Shedding Light on Failure:** *MacKenzie Sellers*<sup>1</sup>; <sup>1</sup>Rolls-Royce Corporation

**4:40 PM**

**Recent Developments in Fatigue Striation Counting:** *Edward Saunders*<sup>1</sup>; <sup>1</sup>Rolls-Royce plc

**5:00 PM**

**Image Acquisition Techniques in Optical Microscopy for Failure Analysis:** *Tom Calahan*<sup>1</sup>; <sup>1</sup>Carl Zeiss MicroImaging, LLC

## Fatigue and Microstructure: A Symposium on Recent Advances: Damage Accumulation

**Program Organizers:** Amit Shyam, Oak Ridge National Laboratory; Sushant Jha, Air Force Research Laboratory/Universal Technology Corporation; Michael Caton, US Air Force Research Laboratory

Monday PM                      Room: D240/241  
October 17, 2011              Location: Columbus Con. Center

**Session Chairs:** Amit Shyam, Oak Ridge National Laboratory; Hael Mughrabi, University of Erlangen-Nürnberg

**2:00 PM**

**Microstructural Fatigue Mechanisms - A Review of Current Work:** *Hael Mughrabi*<sup>1</sup>; <sup>1</sup>University Erlangen-Nuernberg

**2:40 PM**

**Effects of Microstructure in High Temperature Fatigue:** *Luc REMY*<sup>1</sup>; <sup>1</sup>CNRS, Mines ParisTech

**3:00 PM**

**Three-Dimensional Microstructure of Fatigue Cracked Nickel-Base Superalloys:** *Clayton Stein*<sup>1</sup>; C. Hefferan<sup>1</sup>; Peter Kenesei<sup>2</sup>; S. Li<sup>1</sup>; J. Lind<sup>1</sup>; Reeru Pokharel<sup>1</sup>; Joseph Tucker<sup>1</sup>; Robert Suter<sup>1</sup>; Anthony Rollett<sup>1</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Argonne National Laboratory

**3:20 PM Break**

**3:40 PM**

**Microstructure-Sensitive HCF and VHCF Simulations:** *Craig Pryzybyla*<sup>1</sup>; Nima Salajegheh<sup>2</sup>; William Musinski<sup>2</sup>; *David McDowell*<sup>2</sup>; <sup>1</sup>AFRL/RXLM; <sup>2</sup>Georgia Institute of Technology

**4:20 PM**

**Non-Planar Deformation as a Dominant Deformation Mechanism following Low Cycle Fatigue of a Ni-Based Superalloy:** *Patrick Phillips*<sup>1</sup>; Libor Kovarik<sup>2</sup>; Raymond Unocic<sup>3</sup>; Dave Mourer<sup>4</sup>; Dan Wei<sup>4</sup>; Michael Mills<sup>1</sup>; <sup>1</sup>Ohio State University; <sup>2</sup>PNNL; <sup>3</sup>ORNL; <sup>4</sup>GE Aviation

**4:40 PM**

**Fatigue Weaklink Density and Strength Distribution: Materials Properties:** *Tongguang Zhai*<sup>1</sup>; <sup>1</sup>University of Kentucky

**5:00 PM**

**A Microstructural Based Understanding of Hydrogen-Enhanced Fatigue of Stainless Steels:** *May Martin*<sup>1</sup>; Ian Robertson<sup>1</sup>; Petros Sofronis<sup>1</sup>; Yukitaka Murakami<sup>2</sup>; <sup>1</sup>University of Illinois - Urbana-Champaign; <sup>2</sup>Kyushu University

## Glass and Optical Materials: Cooper Award Session on Glass Relaxation

**Program Organizer:** Pierre Lucas, University of Arizona

Monday PM                      Room: C111  
October 17, 2011              Location: Columbus Con. Center

**Session Chair:** Day Delbert, Missouri University of Science and Technology

**2:00 PM Introductory Comments**

**2:20 PM**

**Cooper Distinguished Lecture: The Physics of Iso-Structural Viscosity:** *Prabhat Gupta*<sup>1</sup>; <sup>1</sup>The Ohio State University

**3:00 PM**

**Impact of [Al<sub>2</sub>O<sub>3</sub>]/[SiO<sub>2</sub>] on the Structure of Boroaluminosilicate Glasses:** *Qiuju Zheng*<sup>1</sup>; Randall E. Youngman<sup>2</sup>; Carrie L. Hogue<sup>2</sup>; John C. Mauro<sup>2</sup>; Marcel Potuzak<sup>2</sup>; Adam J. Ellison<sup>2</sup>; Morten M. Smedskjaer<sup>2</sup>; Yuanzheng Yue<sup>3</sup>; <sup>1</sup>Aalborg University - and - Corning Incorporated; <sup>2</sup>Corning Incorporated; <sup>3</sup>Aalborg University - and - Shandong Polytechnic University

**3:20 PM Break**

**3:40 PM**

**Cooper Scholar Presentation 1: Enthalpy of Mixing of Mixed Alkali Glasses:** *Peter J. Lezzi*<sup>1</sup>; <sup>1</sup>Rensselaer Polytechnic Institute

**4:00 PM**

**Cooper Scholar Presentation 2: and Structure of Na<sub>2</sub>S + P<sub>2</sub>S<sub>5</sub> Amorphous Materials Prepared by Mechanical Milling and Melt-Quenching:** *Seth S. Berbano*<sup>1</sup>; <sup>1</sup>Iowa State University

**4:20 PM**

**Automatic and Robust TNM Model Parameter Estimation from Multi-Rate DSC Data:** *Robert Erdmann*<sup>1</sup>; Ellyn King<sup>1</sup>; Pierre Lucas<sup>1</sup>; <sup>1</sup>University of Arizona

**5:00 PM**

**Investigation of Dynamic Processes in Chalcogenide Glasses by Modulated DSC:** *Pierre Lucas*<sup>1</sup>; Ozgur Gulbilen<sup>1</sup>; <sup>1</sup>University of Arizona

## Green Technologies for Materials Manufacturing and Processing III: Green Manufacturing I

**Program Organizers:** Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST); Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center; Richard Sisson, Worcester Polytechnic Institute, Center for Heat Treating Excellence; Makio Naito, Osaka University

Monday PM  
October 17, 2011  
Room: D232  
Location: Columbus Con. Center

**Session Chairs:** Diana Lados, Worcester Polytechnic Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST)

### 2:00 PM Keynote

**Material Recovery and Recycling - Not an Option, But a Prerequisite for a Sustainable Future:** *Diran Apelian*<sup>1</sup>; <sup>1</sup>Worcester Polytechnic Institute

### 2:40 PM Invited

**Innovative and Integrative Materials and Processing: The Key to an Energy-Efficient and Low-Carbon Future:** *Diana A. Lados*<sup>1</sup>; <sup>1</sup>Worcester Polytechnic Institute

### 3:20 PM Break

### 3:40 PM Invited

**Smart Powder Processing for Green Technologies:** *Makio Naito*<sup>1</sup>; Hiroya Abe<sup>1</sup>; Akira Kondo<sup>1</sup>; <sup>1</sup>Osaka University

### 4:00 PM

**Polyalkylene Carbonate Polymers - A Sustainable Material Alternative to Traditional Petrochemical Based Plastics:** *Peter Ferraro*<sup>1</sup>; Sugianto Hanggodo<sup>1</sup>; <sup>1</sup>Empower Materials

### 4:20 PM

**Advanced Sustainable Polymeric Materials Derived from Non-Edible Agricultural By-Products: Applications and Life Cycle Analysis:** *Enrico Ferri*<sup>1</sup>; <sup>1</sup>Composite Technical Services

### 4:40 PM

**Reuse and Reproduction of Used Refractories:** *YU Yanwen*<sup>1</sup>; <sup>1</sup>BAOSHAN IRON & STEEL CO.LTD. CHINA

### 5:00 PM Cancelled

**The DHS Advanced and High Performance Materials Database: A Potential Partnership between the Materials Community and the Construction and Infrastructure Industries:** *Gary Fischman*<sup>1</sup>; Drew Rouland<sup>1</sup>; <sup>1</sup>Future Strategy Solutions LLC

## Hardness across the Multi-Scales of Structure and Loading Rate: Stress-Strain Relations

**Program Organizers:** Ronald Armstrong, University of Maryland; David Bahr, Washington State University; Naresh Thadhani, Georgia Institute of Technology; Stephen Walley, Physics and Chemistry of Solids Cavendish Laboratory

Monday PM  
October 17, 2011  
Room: C210  
Location: Columbus Con. Center

**Session Chairs:** Hans Conrad, North Carolina State University; David Bahr, Washington State University

### 2:00 PM

**Historical Origins of Indentation Hardness Testing:** *Stephen Walley*<sup>1</sup>; <sup>1</sup>Physics and Chemistry of Solids Cavendish Laboratory

### 2:20 PM Invited

**How to Properly Determine Mechanical Properties Using Indentation Test:** *Xi Chen*<sup>1</sup>; <sup>1</sup>Columbia University

### 2:40 PM Invited

**Spherical Nanoindentation and Their Corresponding Stress-Strain Curves:** *Michel Barsoum*<sup>1</sup>; <sup>1</sup>Drexel University

### 3:00 PM Invited

**A FEM Based Elasto-Plastic Contact Model and Some Aspects On The Indentation Response:** *Minnal Mayuram*<sup>1</sup>; <sup>1</sup>IIT Madras

### 3:20 PM Break

### 3:40 PM Invited

**Scale and Stochastic Effects on Unstable Initiation of Plasticity in Nanoindentation:** *Yanfei Gao*<sup>1</sup>; Tianlei Li<sup>1</sup>; Hongbin Bei<sup>2</sup>; Easo George<sup>2</sup>; <sup>1</sup>Univ of Tennessee; <sup>2</sup>Oak Ridge National Laboratory

### 4:00 PM Invited

**Hardening Rates at Small Contacts:** *William Gerberich*<sup>1</sup>; <sup>1</sup>University of Minnesota

### 4:20 PM

**Hardness Properties across the Multi-Scales of Material Structures:** *Ronald Armstrong*<sup>1</sup>; Wayne Elban<sup>2</sup>; <sup>1</sup>University of Maryland; <sup>2</sup>Loyola University Maryland

### 4:40 PM Invited

**Gradient Theory and Micro/Nano Indentation:** *Elias Aifantis*<sup>1</sup>; <sup>1</sup>Aristotle U. Thessaloniki, Greece

### 5:00 PM Invited

**Nanoindentation Shape and Scaling Laws:** *Nicola Pugno*<sup>1</sup>; <sup>1</sup>Politecnico di Torino

### 5:20 PM

**Nano- and Micro-Indentation Investigations of Room Temperature Dislocation Mobility in Ceramics:** *Ghatu Subhash*<sup>1</sup>; Dipankar Ghosh<sup>1</sup>; <sup>1</sup>University of Florida

### 5:40 PM Invited

**Multiscale Approach of Hardness in Aluminum Alloy - Consideration of Rate Dependent Behavior:** *Costas Charitidis*<sup>1</sup>; <sup>1</sup>NTUA

## Innovative Processing and Synthesis of Ceramics, Glasses and Composites: Advanced Processing and Characterization

**Program Organizers:** J. P. Singh, U.S. Army Research Laboratory; Narottam Bansal, NASA Glenn Research Center; Takashi Goto, Tohoku University

Monday PM  
October 17, 2011  
Room: C110  
Location: Columbus Con. Center

**Session Chair:** John Halloran, University of Michigan

### 2:00 PM Invited

**Direct Digital Manufacturing of Ceramics:** *John Halloran*<sup>1</sup>; Suman Das<sup>2</sup>; Vladislava Tomeckova<sup>1</sup>; Susan Gentry<sup>1</sup>; Ryan Breneman<sup>1</sup>; Raphael Alabi<sup>2</sup>; Dajun Yuan<sup>2</sup>; Paul Cilino<sup>2</sup>; Peng Shao<sup>2</sup>; Andirudh Rundraraju<sup>2</sup>; Tao Wu<sup>2</sup>; Matthew Conrad<sup>2</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>Georgia Institute of Technology

### 2:40 PM

**Transparent Armor via Radio Frequency Lamination:** *Shawn Allan*<sup>1</sup>; Inessa Baranova<sup>1</sup>; Morgana Fall<sup>1</sup>; Holly Shulman<sup>1</sup>; <sup>1</sup>Ceralink Inc.

**3:00 PM**

**Fabrication of Hierarchical Architectures in Metal Matrix Composites:** Yufeng Wu<sup>1</sup>; *Gap-Yong Kim*<sup>1</sup>; Can Zhu<sup>1</sup>; <sup>1</sup>Iowa State University

**3:20 PM**

**Transformation Kinetics and Microstructure Refinement in Reactively Processed Co-Continuous Ceramic Composites:** *John DeFouw*<sup>1</sup>; Jonathan Everts<sup>1</sup>; Glenn Daehn<sup>1</sup>; <sup>1</sup>The Ohio State University

**3:40 PM Break**

**4:00 PM**

**Synthesis of Carbon-Carbon Composite via Infiltration Process of Pitch in Based-Wood Material:** Mohammad Esmacely<sup>1</sup>; *Alireza Mirhabibi*<sup>1</sup>; Masoud Bodaghi<sup>1</sup>; <sup>1</sup>Industrial University Science and Technology

**4:20 PM**

**Production of Alumina Fibers by Vapor-Liquid-Solid Mechanism from Aluminum Powder and Porous Silica Preforms:** *Ranran Liu*<sup>1</sup>; Kaiyang Wang<sup>1</sup>; S.M. Guo<sup>1</sup>; <sup>1</sup>Louisiana State University

**4:40 PM**

**An Investigation into Solid-State Expansion of Ceramic Materials:** *Ariane Erickson*<sup>1</sup>; C. Hank Rawlins<sup>2</sup>; <sup>1</sup>Montana Tech of the University of Montana; <sup>2</sup>Montana Process Research

## **Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches -- Fundamental and Engineering Issues: Bridging the Gap between Continuum and Atomistic Approaches for Interfaces**

**Program Organizers:** Wayne Kaplan, Technion - Israel Institute of Technology; Paul Wynblatt, Carnegie Mellon University; Dominique Chatain, Centre Interdisciplinaire de Nanoscience de Marseille; Mikel Holcomb, West Virginia University

Monday PM

Room: C120

October 17, 2011

Location: Columbus Con. Center

**Session Chairs:** Dominique Chatain, CINaM-CNRS ; Wayne Kaplan, Technion - Israel Institute of Technology

**2:00 PM Keynote**

**Grain Boundary Misorientation Instabilities:** *W. Craig Carter*<sup>1</sup>; <sup>1</sup>MIT

**2:40 PM Keynote**

**Atomistic Modeling of Chemically Heterogeneous Solid-Liquid Interfaces:** Pablo Palafox-Hernandez<sup>1</sup>; David Olmsted<sup>2</sup>; *Mark Asta*<sup>2</sup>; Brian Laird<sup>1</sup>; <sup>1</sup>University of Kansas; <sup>2</sup>University of California, Berkeley

**3:20 PM Break Coffee Break**

**3:40 PM Keynote**

**Controversies and Challenges in Interface Thermodynamics:** *Y. Mishin*<sup>1</sup>; <sup>1</sup>George Mason University

**4:20 PM Keynote**

**Probing the Strength of Grain Boundaries and Interfaces with High Spatial Resolution:** *Gerhard Dehm*<sup>1</sup>; <sup>1</sup>University of Leoben, Materials Physics

**5:00 PM**

**Critical Issues to Bridge the Gap between Continuum and Atomistic Approaches to Interfaces:** *Paul Wynblatt*<sup>1</sup>; Hila Meltzman<sup>2</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Technion - Israel Institute of Technology

## **International Symposium on Advances in Nanostructured Materials and Applications: The 2011 Acta Materialia Gold Medal Symposium: Multidisciplinary Research in Nanomaterials**

**Program Organizers:** Haiyan Wang, Texas A&M University; Nuggehalli Ravindra, New Jersey Institute of Technology; Alan Ardell, National Science Foundation; Yuntian Zhu, North Carolina State University; Xinghang Zhang, Texas A&M University; Rajiv K. Singh, University of Florida; John Prater, Army Research Office

Monday PM

Room: E170

October 17, 2011

Location: Columbus Con. Center

**Session Chairs:** Alan Ardell, National Science Foundation; Haiyan Wang, Texas A&M University

**2:00 PM Introductory Comments**

**2:20 PM Invited**

**In-Situ TEM Studies of the Response of a Material to an External Stimulus:** *Ian Robertson*<sup>1</sup>; Josh Kacher<sup>1</sup>; Grace Liu<sup>1</sup>; Buyang Cao<sup>1</sup>; Ben Eftink<sup>1</sup>; Kelly Nygren<sup>1</sup>; <sup>1</sup>University of Illinois

**3:00 PM Invited**

**The Influential Role of Prof. Jay Narayan on the Evolution of Ion Implantation and Annealing of Silicon and Germanium:** *Kevin Jones*<sup>1</sup>; <sup>1</sup>University of Florida

**3:20 PM Invited**

**Nanostructure-Biomolecule Interactions: Implications for Nanomedicine and New Materials:** *Richard Siegel*<sup>1</sup>; <sup>1</sup>Rensselaer Polytechnic Institute

**3:40 PM Break**

**4:00 PM Invited**

**Control of Defects in Thin Film Heterostructures:** *John Prater*<sup>1</sup>; <sup>1</sup>Army Research Office

**4:20 PM Invited**

**Microstructural and Strength Changes in Highly Nanotwinned Cu Resulting from Various Modes of Deformation:** *Julia Weertman*<sup>1</sup>; <sup>1</sup>Northwestern University

**4:40 PM Invited**

**Enhancing the Thermal Stability of Nanostructured Metals by Solute Additions:** *Carl Koch*<sup>1</sup>; Ronald Scattergood<sup>1</sup>; Brian VanLeeuwen<sup>1</sup>; Kristopher Darling<sup>2</sup>; Mark Atwater<sup>1</sup>; Suhrit Mula<sup>1</sup>; Pengchao Kang<sup>1</sup>; <sup>1</sup>North Carolina State University; <sup>2</sup>Army Research Laboratory

**5:00 PM Invited**

**Core-Shell Nanowires and Their Application in Fuel Cells:** *James Li*<sup>1</sup>; <sup>1</sup>University of Rochester

**5:20 PM Invited**

**Bio-Inspired Structural Materials:** *Robert Ritchie*<sup>1</sup>; Antoni Tomsia<sup>2</sup>; <sup>1</sup>University of California Berkeley; <sup>2</sup>Lawrence Berkeley National Laboratory

**5:40 PM Invited**

**Retardation of Grain Growth in Nanocrystalline Zirconia by an Electric Field:** *Hans Conrad*<sup>1</sup>; <sup>1</sup>NC State University

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## International Symposium on Defects, Transport and Related Phenomena: Defects and Transport in Ceramics I

*Program Organizers:* Sangtae Kim, University of California, Davis; Ruediger Dieckmann, Cornell University; Doreen Edwards, Alfred University; Manfred Martin, RWTH Aachen University; Thomas Mason, Northwestern University

Monday PM                      Room: C122  
October 17, 2011              Location: Columbus Con. Center

*Funding support provided by:* WCU Hybrid Materials Program, Department of Materials Science and Engineering, Seoul National University, Korea

*Session Chairs:* Paul Heitjans, Leibniz University Hannover; Joachim Maier, Max-Planck-Institute

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### 2:00 PM Invited

**Charge Carrier Chemistry in Nanoscopic Materials:** *Joachim Maier*<sup>1</sup>; <sup>1</sup>Max-Planck-Institute

### 2:40 PM Invited

**Fast Li<sup>+</sup> Ion Conductors for Solid State Batteries:** *Stefan Adams*<sup>1</sup>; Rayavarapu Prasada Rao<sup>1</sup>; Mao-hua Chen<sup>1</sup>; <sup>1</sup>National University of Singapore

### 3:20 PM Break

### 3:40 PM Invited

**Ion Dynamics at Interfaces: Nuclear Magnetic Resonance Studies:** *Paul Heitjans*<sup>1</sup>; Martin Wilkening<sup>1</sup>; <sup>1</sup>Leibniz University Hannover

### 4:20 PM

**Self Diffusion in Alpha-Al<sub>2</sub>O<sub>3</sub>:** *Tsubasa nakagawa*<sup>1</sup>; Nobuaki Takahashi<sup>1</sup>; Naoya Shibata<sup>2</sup>; Yuichi Ikuhara<sup>2</sup>; James D McGuffinCawley<sup>1</sup>; Arhur H Heuer<sup>1</sup>; <sup>1</sup>Case Western Reserve University; <sup>2</sup>The University of Tokyo

### 4:40 PM

**Orientation, Oxygen Activity and Temperature Dependencies of the Diffusion of Cobalt in Cobalt Orthosilicate, Co<sub>2</sub>SiO<sub>4</sub>:** *Qi Tang*<sup>1</sup>; Ruediger Dieckmann<sup>1</sup>; <sup>1</sup>Cornell University

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## Joining of Advanced and Specialty Materials (JASM XIII): Solid State Joining

*Program Organizers:* Judith Schneider, Mississippi State University; Norman Zhou, Univ. of Waterloo; Leijun Li, Utah State University; Mathieu Brochu, McGill University; Boian Alexandrov, The Ohio State University; Michael Halbig, U.S. Army Research Laboratory; Akio Hirose, Osaka University; Sammy Tin, Illinois Institute of Technology

Monday PM                      Room: E161B  
October 17, 2011              Location: Columbus Con. Center

*Session Chairs:* Judy Schneider, Mississippi State University; Yuri Hovanski, Pacific Northwest National Laboratory

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### 2:00 PM

**Microstructure and Microhardness of Friction Stir Processed 2219-T6 Al Alloy:** *Xiuli Feng*<sup>1</sup>; Huijie Liu<sup>2</sup>; Sudarsanam Babu<sup>1</sup>; Anil Chaudhary<sup>3</sup>; Matt Keller<sup>3</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Harbin Institute of Technology; <sup>3</sup>Applied Optimization

### 2:20 PM

**Multiple-Pass Friction Stir Welding and Processing of 2014 T6 Aluminium Alloy:** *preetam anbukarasu*<sup>1</sup>; geo harrison wilfred<sup>1</sup>; ganapathy subramanian<sup>1</sup>; <sup>1</sup>anna university

### 2:40 PM

**Microstructure and Corrosion Investigation of Friction Stir Welds of Dissimilar Aluminum Alloys:** *Douglas Larson*<sup>1</sup>; Benjamin Waldera<sup>1</sup>; CJ Sitter<sup>1</sup>; Samar Kalita<sup>1</sup>; <sup>1</sup>University of North Dakota

### 3:00 PM

**Using Linear Discriminate Analysis to Determine FSW Quality:** *Haley Doude*<sup>1</sup>; Ben Ma<sup>1</sup>; Judy Schneider<sup>1</sup>; Jenny Du<sup>1</sup>; <sup>1</sup>Mississippi State University

### 3:20 PM Break

### 3:40 PM

**1D and 2D Friction Stir Welding Heat Generation Models:** *Jose Morfa*<sup>1</sup>; <sup>1</sup>Mississippi State

### 4:00 PM

**Influence of Tool Pin Profile on the Interface Migration of Friction Stir Lap Welds:** *Li Xing*<sup>1</sup>; Liming Ke<sup>1</sup>; <sup>1</sup>Nanchang Hangkong University

### 4:20 PM

**Deposition of Thick Corrosion Resistant Metallic Coatings on HY80 Steel Using Friction Stir Fabrication:** *Jeffrey Schultz*<sup>1</sup>; <sup>1</sup>Schultz-Creehan, LLC

### 4:40 PM

**Effect of Groove Size on Mechanical Property in Friction Stir Welded Aluminum Alloy/Stainless Steel Lap Joint:** *Taichi Nishida*<sup>1</sup>; Tomo Ogura<sup>1</sup>; Hidehito Nishida<sup>2</sup>; Takumi Yoshida<sup>2</sup>; Noriko Ohmichi<sup>2</sup>; Mitsuo Fujimoto<sup>2</sup>; Akio Hirose<sup>1</sup>; <sup>1</sup>Osaka University; <sup>2</sup>Kawasaki Heavy Industries, LTD.

### 5:20 PM

**Optimization of Mechanical Performance of Friction Spot Welded Joints in 2198-T8 Aluminium Alloy Sheets:** *Jorge dos Santos*<sup>1</sup>; Gabriel Pieta<sup>2</sup>; <sup>1</sup>GKSS Forschungszentrum; <sup>2</sup>Helmholz-Zentrum Geesthacht GmbH

### 5:00 PM

**Interfacial Microstructure and Mechanical Property in Friction Stir Welded Aluminum Alloy/Stainless Steel Dissimilar Lap Joint:** *Tomo Ogura*<sup>1</sup>; Yuichi Saito<sup>1</sup>; Hidehito Nishida<sup>2</sup>; Takumi Yoshida<sup>2</sup>; Noriko Ohmichi<sup>2</sup>; Mitsuo Fujimoto<sup>2</sup>; Akio Hirose<sup>1</sup>; <sup>1</sup>Osaka University; <sup>2</sup>Kawasaki Heavy Industries, LTD.

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## Laser Applications in Materials Technology (II): Laser Materials Processing

*Program Organizer:* Stephen Copley, Penn State

Monday PM                      Room: E161A  
October 17, 2011              Location: Columbus Con. Center

*Session Chair:* Stephen Copley, Penn State University/Applied Research Laboratory

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### 2:00 PM

**Solid Free Form or Joining by Gas Phase Laser Oxide Deposition:** *Clayton Weiss*<sup>1</sup>; Harris Marcus<sup>1</sup>; <sup>1</sup>Institute of Materials Science-University of Connecticut

### 2:20 PM

**Microstructural Analysis of Laser Sustained Nitrogen Plasma Interaction with Titanium:** *Amber Black*<sup>1</sup>; Ravindra Akarapu<sup>1</sup>; Stephen Copley<sup>1</sup>; Judith Todd<sup>1</sup>; <sup>1</sup>Penn State

### 2:40 PM

**On CO<sub>2</sub> Laser Nitriding of Titanium:** *Abdalla Nassar*<sup>1</sup>; Ravindra Akarapu<sup>1</sup>; Stephen Copley<sup>1</sup>; Judith Todd<sup>1</sup>; <sup>1</sup>Penn State



## 3:00 PM

**Use of Two Photon Polymerization for Additive Fabrication of Small-Scale Medical Devices:** *Roger Narayan*<sup>1</sup>; Anand Doraiswamy<sup>2</sup>; Shaun Gittard<sup>1</sup>; Aleksandr Ovsianikov<sup>3</sup>; Boris Chichkov<sup>3</sup>; <sup>1</sup>Univ of North Carolina & North Carolina State Univ; <sup>2</sup>Advanced Vision Science, Inc.; <sup>3</sup>Laser Zentrum Hannover

## 3:20 PM Break

## 3:40 PM

**The Effects of Laser Machining on Structure and Mechanical Properties of micro-channel heat exchangers alloys:** *Hossein Lavaf*<sup>1</sup>; David Schwam<sup>1</sup>; John Lewandowski<sup>1</sup>; <sup>1</sup>CWRU

## 4:00 PM

**Plasma/Laser Assisted Template Free Synthesis of ZnO Pillars:** *Raj Siman Ugapathy*<sup>1</sup>; Raghavender Tummala<sup>1</sup>; Ramesh Kumar Guduru<sup>1</sup>; Pravansu Mohanty<sup>1</sup>; <sup>1</sup>Univ of Michigan

## 4:20 PM

**Diode Laser Surface Treatment of Structural Aluminum Alloys 7075, 2024, 5456 and 6061: Microstructure and Corrosion Properties:** *Samar Kalita*<sup>1</sup>; <sup>1</sup>Advanced Engineered Materials Center, University of North Dakota

## 4:40 PM

**Localized Measurements of the Coefficient of Thermal-Expansion at Micron-Scale Spatial Resolution:** *Changdong Wei*<sup>1</sup>; Peng Zhao<sup>1</sup>; Siwei Cao<sup>1</sup>; Xuan Zheng<sup>2</sup>; Ji-Cheng Zhao<sup>1</sup>; <sup>1</sup>the Ohio State University; <sup>2</sup>Seagate Technology

## 5:00 PM

**Composition-Dependent Thermal Conductivity of Several Binary Systems:** *Siwei Cao*<sup>1</sup>; Xuan Zheng<sup>2</sup>; Ji-Cheng Zhao<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Seagate Technology

## 5:20 PM Cancelled

**Property Change during Nanosecond Pulse Laser Annealing of Amorphous NiTi Thin Film:** *noushin yasavol*<sup>1</sup>; *Khatiboleslam Sadrnezhaad*<sup>2</sup>; Mansoureh Ganjali<sup>3</sup>; <sup>1</sup>tarbiat modares univ; <sup>2</sup>Sharif university; <sup>3</sup>Materials and Energy Research Center

## Localized Corrosion -- Measurement, Mechanisms and Mitigation: Light Metals

*Program Organizer:* Gerald Frankel, Ohio State University

Monday PM  
October 17, 2011

Room: D244/245  
Location: Columbus Con. Center

*Session Chair:* Gerald Frankel, The Ohio State University

## 2:00 PM

**Microstructural Aspects That Accompany Localised Corrosion of Sensitised AA5083:** *Nick Birbilis*<sup>1</sup>; <sup>1</sup>Monash University

## 2:20 PM

**Atmospheric Pitting Corrosion of Al Alloys:** *Sean Morton*<sup>1</sup>; Jinfeng Li<sup>2</sup>; Gerald Frankel<sup>1</sup>; <sup>1</sup>Ohio State University; <sup>2</sup>Central South University

## 2:40 PM

**Understanding the Role of Intermetallic Particles in Localized Corrosion: A Multiscale Modeling Approach:** *Jie Xiao*<sup>1</sup>; Hyunwook Kwak<sup>1</sup>; *Santanu Chaudhuri*<sup>1</sup>; <sup>1</sup>Washington State University

## 3:00 PM

**The Effect of Weak Acids on Localized Corrosion Morphologies in High Strength Aluminum Alloys:** *Alexandra Neeley*<sup>1</sup>; Rudy Buchheit<sup>1</sup>; <sup>1</sup>OSU

## 3:20 PM Break

## 3:40 PM

**Fabrication and Characterization of Porous Aluminum Alloys by Chemical Dealloying: Effect of Concentration and Cooling Rate:** *Elvin Estremera*<sup>1</sup>; O. Marcelo Suarez<sup>1</sup>; Arturo Hernandez-Maldonado<sup>1</sup>; <sup>1</sup>University of Puerto Rico

## 4:00 PM

**The Effect of Stress on Localized Corrosion of AA7050:** *Junfeng Chen*<sup>1</sup>; Gerald Frankel<sup>2</sup>; Liang Zhen<sup>1</sup>; Wenzhu Shao<sup>1</sup>; <sup>1</sup>Harbin Institute of Technology; <sup>2</sup>Ohio State University

## 4:20 PM

**First-Principles-Based Analysis on the Role of RE Doping on Mg Alloy Corrosion:** *Hyunwook Kwak*<sup>1</sup>; *Santanu Chaudhuri*<sup>1</sup>; <sup>1</sup>ISP/Applied Sciences Laboratory, Washington State University

## 4:40 PM

**Surface Corrosion Behavior of Electron-Excited Pure Mg:** *Keisuke Funatsu*<sup>1</sup>; Rei Takei<sup>1</sup>; Junko Umeda<sup>2</sup>; Katsuyoshi Kondoh<sup>2</sup>; <sup>1</sup>Graduate school of osaka university; <sup>2</sup>Osaka university

## 5:00 PM

**Aluminum Weld Metal Corrosion:** *Philip Vormelker*<sup>1</sup>; Adrian Mendez-Torres<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

## Materials Science Challenges for Nuclear Applications: Defects in Irradiated Alloys

*Program Organizers:* Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprashad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Monday PM  
October 17, 2011

Room: C225  
Location: Columbus Con. Center

*Session Chairs:* Kumar Sridharan, University of Wisconsin; Ramprashad Prabhakaran, Idaho National Laboratory

## 3:40 PM Invited

**Behavior of Dislocations in Irradiated Metals:** *Ian Robertson*<sup>1</sup>; Josh Kacher<sup>1</sup>; Grace Liu<sup>1</sup>; <sup>1</sup>University of Illinois

## 4:20 PM

**Effect of He and Heavy Ion Irradiation on Grain Boundaries in Nanostructured Ferritic Steels:** *Chad Parish*<sup>1</sup>; Philip Edmondson<sup>1</sup>; Yanwen Zhang<sup>1</sup>; Anders Hallen<sup>2</sup>; Michael Miller<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>Royal Institute of Technology

## 4:40 PM

**Irradiation Studies on Friction Stir Welded ODS Alloys:** *Ramprashad Prabhakaran*<sup>1</sup>; J Wang<sup>2</sup>; Brandon Miller<sup>1</sup>; Indrajit Charit<sup>3</sup>; Rajiv Mishra<sup>2</sup>; <sup>1</sup>Idaho National Laboratory; <sup>2</sup>Missouri University of Science and Technology; <sup>3</sup>University of Idaho

## 5:00 PM

**Phase Field Prediction of Void Behavior in U-Zr Alloys under Radiation:** *Ximiao Pan*<sup>1</sup>; Yunzhi Wang<sup>1</sup>; <sup>1</sup>OSU

## Materials Science Challenges for Nuclear Applications: Ion Irradiation Effects

**Program Organizers:** Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprasad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Monday PM  
October 17, 2011  
Room: C225  
Location: Columbus Con. Center

**Session Chairs:** Ian Robertson, University of Illinois; Kumar Sridharan, University of Wisconsin

### 2:00 PM Invited

**Strategies for Studying High Dose Irradiation Effects in Reactor Components:** Gary Was<sup>1</sup>; Zhijie Jiao<sup>1</sup>; <sup>1</sup>University of Michigan

### 2:40 PM

**The Effect of Self-Ion Irradiation on the Indentation Response of Iron and Tungsten:** Chris Hardie<sup>1</sup>; David Armstrong<sup>1</sup>; T Ben Britton<sup>1</sup>; Angus Wilkinson<sup>1</sup>; Steve Roberts<sup>1</sup>; <sup>1</sup>Department of Materials, University of Oxford

### 3:00 PM

**Grain Size Effect on Radiation Induced Defect Distribution in Iron:** Greg Vetterick<sup>1</sup>; Christopher Barr<sup>1</sup>; Marquis Kirk<sup>2</sup>; Peter Baldo<sup>2</sup>; Mitra Taheri<sup>1</sup>; <sup>1</sup>Drexel University; <sup>2</sup>Argonne National Laboratory

### 3:20 PM Break

## Multi Scale Modeling of Microstructure Deformation in Material Processing: Session I

**Program Organizer:** Lukasz Madej, Akademia Gorniczno Hutnicza

Monday PM  
October 17, 2011  
Room: C211  
Location: Columbus Con. Center

**Session Chairs:** Tonya Stone, Mississippi State University; Javier Llorca, Madrid Institute for Advanced Studies of Materials

### 2:00 PM

**Stereology of Synthetic Microstructures Representing Ni-Based Superalloys:** Joseph Tucker<sup>1</sup>; Clayton Stein<sup>1</sup>; Steve Sintay<sup>2</sup>; Lisa Chan<sup>3</sup>; Tony Rollett<sup>1</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>LANL; <sup>3</sup>EDAX

### 2:20 PM

**Crystal Plasticity Finite Element Modeling and Experimental Characterization of Deformation System Activity in CP-Titanium:** Yiyi Yang<sup>1</sup>; Leyun Wang<sup>1</sup>; Thomas Bieler<sup>1</sup>; Philip Eisenlohr<sup>2</sup>; Martin Crimp<sup>1</sup>; <sup>1</sup>Michigan State University; <sup>2</sup>Max-Planck-Institut für Eisenforschung

### 2:40 PM

**Multiscale Modelling of Microstructure Evolution during Cold Rolling:** Javier LLorca<sup>1</sup>; Javier Segurado<sup>1</sup>; Teresa Pérez-Prado<sup>2</sup>; <sup>1</sup>Polytechnic University of Madrid/IMDEA Materials Institute; <sup>2</sup>IMDEA Materials Institute

### 3:00 PM

**Deformation Modeling of Magnesium Alloys Using Tensor Theory:** Krista Kalac<sup>1</sup>; Rajiv Mishra<sup>1</sup>; <sup>1</sup>Missouri S&T

### 3:20 PM Break

### 3:40 PM

**Variable-Rate Polycrystal Plasticity by Modeling Dislocation Density Rate Behavior:** Benjamin Hansen<sup>1</sup>; Curt Bronkhorst<sup>1</sup>; Irene Beyerlein<sup>1</sup>; Darcie Dennis-Koller<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

### 4:00 PM

**Tools for Generation of Digital Material Representations:** Lukasz Madej<sup>1</sup>; Joanna Szyndler<sup>1</sup>; Kamil Pasternak<sup>1</sup>; Mateusz Przenzak<sup>1</sup>; Lukasz Rauch<sup>1</sup>; <sup>1</sup>Akademia Gorniczno Hutnicza

### 4:20 PM

**Deformation Mechanisms in Nanocrystalline Metals:** Tonya Stone<sup>1</sup>; Olufemi Asafa<sup>1</sup>; Joshua Stone<sup>2</sup>; Youssef Hammi<sup>3</sup>; <sup>1</sup>Mississippi State University; <sup>2</sup>Mississippi School for Math and Science; <sup>3</sup>Center for Advanced Vehicular Systems

### 4:40 PM

**Mechanism of Climb of Dissociated Dislocations in Copper: A Diffusive Molecular Dynamics Study:** Sanket Sarkar<sup>1</sup>; William Cox<sup>1</sup>; Ju Li<sup>2</sup>; Yunzhi Wang<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>University of Pennsylvania

### 5:00 PM

**Molecular Dynamics Study of Frictional Effects on the Compaction of Metal Nanoparticles:** Olufemi Asafa<sup>1</sup>; Tonya Stone<sup>1</sup>; Mark Tschopp<sup>2</sup>; Philip Gullett<sup>1</sup>; Mark Horstemeyer<sup>1</sup>; <sup>1</sup>Mississippi State University; <sup>2</sup>Center for Advance Vehicular Systems

## Multifunctional Oxides: Session I

**Program Organizer:** Xiaoqing Pan, University of Michigan

Monday PM  
October 17, 2011  
Room: E162A  
Location: Columbus Con. Center

**Session Chairs:** Xiaoqing Pan, University of Michigan; quanxi Jia, Los Alamos National Lab

### 2:00 PM Invited

**ABF STEM Imaging of Light Elements in Oxides:** Yuichi Ikuhara<sup>1</sup>; Rong Hunag<sup>2</sup>; Scott Findlay<sup>1</sup>; Teruyasu Mizoguchi<sup>1</sup>; Naoya Shibata<sup>1</sup>; Tsukasa Hirayama<sup>2</sup>; <sup>1</sup>University of Tokyo; <sup>2</sup>Japan Fine Ceramics Center

### 2:40 PM

**Oxide Nanopillars in Co-Doped BaFe<sub>2</sub>As<sub>2</sub> Films for Vortex Pinning:** Yi Zhang<sup>1</sup>; Chris Nelson<sup>1</sup>; Sanghan Lee<sup>2</sup>; Jianyi Jiang<sup>3</sup>; Eric Hellstrom<sup>3</sup>; David Larbalestier<sup>3</sup>; Chang-Beom Eom<sup>2</sup>; Xiaoqing Pan<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>University of Wisconsin; <sup>3</sup>Florida State University

### 3:00 PM

**Insulator-to-Metal Transition Induced by Insulating Layers in A-Site Excess Nonstoichiometric Oxides:** Zhongchang Wang<sup>1</sup>; M Okude<sup>2</sup>; M Saito<sup>1</sup>; S Tsukimoto<sup>1</sup>; A Ohtomo<sup>2</sup>; M Tsukada<sup>1</sup>; M Kawasaki<sup>1</sup>; Yuichi Ikuhara<sup>1</sup>; <sup>1</sup>WPI-AIMR, Tohoku Univ.; <sup>2</sup>IMR, Tohoku Univ.

### 3:20 PM Break

### 3:40 PM Invited

**On the Origin of Reduced Thermal Conductivity in Misfit Layered Thermoelectric (Ca<sub>2</sub>CoO<sub>3</sub>)<sub>0.62</sub>CoO<sub>2</sub>:** Lijun Wu<sup>1</sup>; Qingping Meng<sup>1</sup>; Christian Jooss<sup>2</sup>; Qiang Li<sup>1</sup>; Yimei Zhu<sup>1</sup>; <sup>1</sup>Brookhaven National Laboratory; <sup>2</sup>University of Goettingen

## 4:20 PM Invited

**Interfaces in Nanostructured Functional Oxide Thin Films:** *Haiyan Wang*<sup>1</sup>; Zhenxing Bi<sup>1</sup>; Aiping Chen<sup>1</sup>; Chen-Fong Tsai<sup>1</sup>; Yuanyuan Zhu<sup>1</sup>; Li Chen<sup>1</sup>; Joon Hwan Lee<sup>1</sup>; Sungmee Cho<sup>1</sup>; Qing Su<sup>1</sup>; Michelle Myers<sup>1</sup>; Quanxi Jia<sup>2</sup>; Hao Yang<sup>3</sup>; Judith MacManus-Driscoll<sup>4</sup>; <sup>1</sup>Texas A&M University; <sup>2</sup>Los Alamos National Laboratory; <sup>3</sup>Suzhou University; <sup>4</sup>University of Cambridge

## 5:00 PM

**Strain and Interface Engineering in Self-Assembled Nanocomposite Oxide Films:** *Hao Yang*<sup>1</sup>; Haiyan Wang<sup>2</sup>; Judith L. MacManus-Driscoll<sup>3</sup>; Quanxi Jia<sup>4</sup>; <sup>1</sup>Soochow University; <sup>2</sup>Texas A&M University; <sup>3</sup>University of Cambridge; <sup>4</sup>Los Alamos National Laboratory

## Nano- and Atomic-Scale Fracture: Environmental Effects

*Program Organizers:* Lawrence Friedman, NIST; Stephen Freiman, NIST

Monday PM  
October 17, 2011

Room: C125  
Location: Columbus Con. Center

*Session Chair:* Sheldon Wiederhorn, National Institute of Standards and Technology

## 2:00 PM

**Multi-Scale Models of Crack Propagation and Their Use in Reliability Predictions for Brittle Materials:** *Robert Cook*<sup>1</sup>; <sup>1</sup>National Institute of Standards and Technology

## 2:40 PM

**Nanoscale Investigation of the Condensation and Diffusion of Water at Crack Tips in Glass:** *Laurent Ponson*<sup>1</sup>; Gaël Pallares<sup>2</sup>; Matthieu Georges<sup>2</sup>; Mattéo Ciccotti<sup>3</sup>; Elisabeth Bouchaud<sup>4</sup>; <sup>1</sup>CNRS; <sup>2</sup>Université de Montpellier; <sup>3</sup>ESPCI; <sup>4</sup>CEA

## 3:20 PM Break

## 4:00 PM

**Surface Stress Relaxation as a Cause of Static Fatigue Limit:** *Minoru Tomozawa*<sup>1</sup>; Peter Lezzi<sup>1</sup>; Terry Blanchet<sup>1</sup>; <sup>1</sup>RPI

## 4:40 PM

**Water Penetration at the Crack Tip and Its Effect on Strength and Crack Growth in Silica Glass:** *Sheldon Wiederhorn*<sup>1</sup>; Jean-Pierre Guin<sup>2</sup>; Theo Fett<sup>3</sup>; <sup>1</sup>National Institute of Standards and Technology; <sup>2</sup>University of Rennes 1; <sup>3</sup>Karlsruhe Institute of Technology

## Next Generation Biomaterials: Ceramic Biomaterials

*Program Organizers:* Roger Narayan, Univ of North Carolina & North Carolina State Univ; Kalpana Katti, North Dakota State University; Kajal Mallick, University of Warwick; Vilupanur Ravi, California State Polytechnic University, Pomona; Varshni Singh, Louisiana State University

Monday PM  
October 17, 2011

Room: C215  
Location: Columbus Con. Center

*Session Chairs:* Kalpana Katti, North Dakota State University; Kajal Mallick, University of Warwick

## 2:00 PM Invited

**Directed Bone Regeneration to Prevent Fatigue Failure of Osteoceramic Orthopedic Implants:** *Thomas McGee*<sup>1</sup>; <sup>1</sup>Iowa State University

## 2:20 PM Invited

**Bioactive Glass in Tissue Engineering:** *Mohamed Rahaman*<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology

## 2:40 PM Invited

**Collagen-Hydroxyapatite Mechanics in Human Bone:** *Dinesh Katti*<sup>1</sup>; Shashindra Pradhan<sup>1</sup>; Kalpana Katti<sup>1</sup>; <sup>1</sup>North Dakota State University

## 3:00 PM Invited

**Chain Silicate Glass Ceramics: An Overview of Their Potential for Biomedical Applications:** *Ian Reaney*<sup>1</sup>; <sup>1</sup>University of Sheffield

## 3:20 PM Break

## 3:40 PM Invited

**Accelerated Transformation of Brushite to Octacalcium Phosphate in New Biomineralization Media between 36.5 C and 80 C:** *A. Cuneyt Tas*<sup>1</sup>; Giray Girissen<sup>2</sup>; Neslihan Temizel<sup>2</sup>; <sup>1</sup>University of Oklahoma; <sup>2</sup>Yeditepe University

## 4:00 PM Invited

**Resorbable Calcium Phosphate Scaffolds in Bone Tissue Engineering:** *Susmita Bose*<sup>1</sup>; <sup>1</sup>Washington State University

## 4:20 PM Invited

**Preparation and Characterization of Nanophase Hydroxyapatite via Self-Propagating High Temperature Synthesis and Aqueous Precipitation:** *Sophie Cox*<sup>1</sup>; Kajal Mallick<sup>1</sup>; <sup>1</sup>Warwick University

## 4:40 PM

**Injectable Bone Mineral Cements: Current and Future Trends:** Solène TADIER<sup>1</sup>; Nadine LE BOLAY<sup>2</sup>; Sophie GIROD - FULLANA<sup>3</sup>; Sophie CAZALBOU<sup>3</sup>; Reine BAREILLE<sup>4</sup>; Christian REY<sup>1</sup>; *Christèle COMBES*<sup>1</sup>; <sup>1</sup>INPT - CIRIMAT; <sup>2</sup>INPT-LGC; <sup>3</sup>UPS-CIRIMAT; <sup>4</sup>Inserm U1026 - U of Bordeaux

## 5:00 PM Invited

**In Situ Mineralization of Hydroxyapatite in Intercalated Nanoclays for Bone Tissue Engineering:** *Kalpana Katti*<sup>1</sup>; Avinash Ambre<sup>1</sup>; Dinesh Katti<sup>1</sup>; Anurag Sharma<sup>1</sup>; <sup>1</sup>North Dakota State University

## Novel Sintering Processes and News in Traditional Sintering and Grain Growth: Energetics and Fundamentals of NanoSintering

*Program Organizers:* Ricardo H. R. Castro, University of California at Davis; Douglas Gouvêa, Universidade de São Paulo

Monday PM  
October 17, 2011

Room: C222  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

## 2:00 PM Invited

**Systematics of Surface and Interface Energies in Oxides:** *Alexandra Navrotsky*<sup>1</sup>; <sup>1</sup>UC Davis

## 2:40 PM Invited

**Ordered Complexions: The Structure and Energy of Ni-Al<sub>2</sub>O<sub>3</sub> Interfaces:** Hila Meltzman<sup>1</sup>; *Wayne Kaplan*<sup>1</sup>; <sup>1</sup>Technion - Israel Institute of Technology

## 3:20 PM Break

## 3:40 PM Invited

**What Do We Know About Nano-Effects in Sintering?:** *Jingzhe Pan*<sup>1</sup>; <sup>1</sup>University of Leicester

#### 4:20 PM Invited

**The Effect of Dispersion and Particle Size on the Consolidation Behavior of Nanopowders during Spark Plasma Sintering:** *Olivia Graeve*<sup>1</sup>; <sup>1</sup>Alfred University

#### 5:00 PM

**The Effect of Powder Processing on the Densification Mechanisms of Ultra-High Temperature Ceramic Composites Using Spark Plasma Sintering:** Luke Walker<sup>1</sup>; Will Pinc<sup>1</sup>; *Erica Corral*<sup>1</sup>; <sup>1</sup>The University of Arizona

#### 5:20 PM

**Adhesive Contact Formation between Faceted Nanoparticles and Initial Stages of Their Sintering:** Dan Mordehai<sup>1</sup>; Leonid Klinger<sup>1</sup>; David Srolovitz<sup>2</sup>; *Eugen Rabkin*<sup>1</sup>; <sup>1</sup>Technion; <sup>2</sup>Institute of High Performance Computing

### Pb-Free Solders and Next Generation Interconnects: Next Generation Interconnects

**Program Organizers:** Sehoon Yoo, Korea Institute of Industrial Technology; Andre Lee, Michigan State University; Govindarajan Muralidharan, Oak Ridge National Laboratory; Young-Ho Kim, Hanyang University

Monday PM  
October 17, 2011

Room: E160B  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

#### 2:00 PM Invited

**Low-Temperature Sintering of Nanosilver Paste for Lead-Free Chip Attach:** *Guo-Quan Lu*<sup>1</sup>; <sup>1</sup>Virginia Tech

#### 2:40 PM

**Evaluation of Bondability and Reliability in Metal-to-Metal Bonding Using Ag<sub>2</sub>O Pastes with Polyethylene Glycols:** *Tomohiro Yagishita*<sup>1</sup>; Tomo Ogura<sup>1</sup>; Akio Hirose<sup>1</sup>; <sup>1</sup>Osaka university

#### 3:00 PM

**Overcoming Substrate-Imposed Thermal Limitations on the Processing of Conductive Ink Interconnects:** *David Roberson*<sup>1</sup>; Eric MacDonald<sup>2</sup>; Ryan Wicker<sup>2</sup>; <sup>1</sup>The University of Texas at El Paso; <sup>2</sup>W.M. Keck Center for 3D Innovation

#### 3:20 PM Break

#### 3:40 PM Invited

**Effect of High Temperature Aging on Microstructural Evolution in AuSn Solder Joints:** Rui Zhang<sup>1</sup>; *R. Wayne Johnson*<sup>1</sup>; Govindarajan Muralidharan<sup>2</sup>; Tan Zhang<sup>3</sup>; David Shaddock<sup>3</sup>; <sup>1</sup>Auburn University; <sup>2</sup>Oak Ridge National Laboratory; <sup>3</sup>GE Global Research Center

#### 4:20 PM

**Effect of Flip Chip Bonding Temperature on the Intermetallic Compounds Growth of Au Stud Bumps:** Young-Kyu Lee<sup>1</sup>; *Yong-Ho Ko*<sup>2</sup>; Sehoon Yoo<sup>2</sup>; Chang-Woo Lee<sup>2</sup>; <sup>1</sup>University of Science & Technology; <sup>2</sup>Korea Institute of Industrial Technology

#### 4:40 PM

**Effect of Pad Finish on the Reliability of Cu Bumps Fabricated Using Cu<sub>3</sub>Sn and ENIG Capping Layers for TSV Applications:** *Sung Woo Ma*<sup>1</sup>; Jeong Hwan Lee<sup>1</sup>; Tae Jin Kim<sup>1</sup>; Jin-Young Park<sup>1</sup>; Jin Su Lee<sup>2</sup>; Ki Bum Kim<sup>2</sup>; Jae Myun Kim<sup>2</sup>; Jae Sung Oh<sup>2</sup>; Kwang Yoo Byun<sup>2</sup>; Young-Ho Kim<sup>1</sup>; <sup>1</sup>Hanyang University; <sup>2</sup>Hynix Semiconductor Inc

#### 5:00 PM

**Effect of Cr addition on Mechanical Property and Oxidation Resistance of Pure Zn as SiC Die Bonding Material:** *Sungwon Park*<sup>1</sup>; Keun-Soo Kim<sup>2</sup>; Katsuaki suganuma<sup>3</sup>; <sup>1</sup>Osaka University; <sup>2</sup>Hoseo University; <sup>3</sup>Institute of Scientific and Industrial Research, Osaka University

### Phase Stability, Diffusion, Kinetics and their Applications (PSDK-VI): Phase Stability and Diffusional Processes I

**Program Organizers:** Jeffrey LaCombe, University of Nevada, Reno; Yongho Sohn, University of Central Florida; John Morral, Ohio State University; Ursula Kattner, National Institute of Standards and Technology; Abhijeet Misra, QuesTek Innovations LLC

Monday PM  
October 17, 2011

Room: C214  
Location: Columbus Con. Center

*Session Chairs:* Patrice Turchi, Lawrence Livermore National Laboratory; Abhijeet Misra, QuesTek Innovations LLC

#### 2:00 PM

**Are Correlations Important in Diffusion?:** *Graeme Murch*<sup>1</sup>; Irina Belova<sup>1</sup>; Nagraj Kulkarni<sup>2</sup>; <sup>1</sup>The University of Newcastle; <sup>2</sup>Oak Ridge National Laboratory

#### 2:40 PM

**External Energy Pulse Accelerated Anomalous Mass Transfer (AMT):** *Roman Mezhrinsky*<sup>1</sup>; <sup>1</sup>unemployed

#### 3:00 PM

**Phase Field Simulations of Two Type 4 Boundaries in Quaternary Diffusion Couples:** *Xiaoqin Ke*<sup>1</sup>; Yunzhi Wang<sup>1</sup>; John Morral<sup>1</sup>; <sup>1</sup>Ohio State University

#### 3:20 PM

**Numerical Simulation of Carbon and Nitrogen Profiles Produced by Plasma Carbonitriding:** *Gary Michal*<sup>1</sup>; Xiaoting Gu<sup>1</sup>; Arthur Heuer<sup>1</sup>; Frank Ernst<sup>1</sup>; <sup>1</sup>Case Western Reserve Univ.

#### 3:40 PM Break

#### 4:00 PM

**Prediction of Weld Microstructure Using Thermodynamic and Kinetic Tools:** Xinghua Yu<sup>1</sup>; Tapasvi Lolla<sup>1</sup>; *Sudarsanam Babu*<sup>1</sup>; <sup>1</sup>Ohio State University

#### 4:40 PM

**Thermodynamic Database Validation and the Role Of Ab Initio:** *Patrice Turchi*<sup>1</sup>; Alexander Landa<sup>1</sup>; Per Söderlind<sup>1</sup>; <sup>1</sup>Lawrence Livermore National Laboratory

#### 5:20 PM

**Open Calphad - Software and Databases:** *Ursula Kattner*<sup>1</sup>; Bo Sundman<sup>2</sup>; Mauro Palumbo<sup>3</sup>; Suzana Fries<sup>3</sup>; <sup>1</sup>National Institute of Standards and Technology; <sup>2</sup>INSTN CEA - Saclay; <sup>3</sup>Ruhr University Bochum

#### 5:40 PM

**Development of 40 vol. % and 20 vol. % (AlN+Mg<sub>2</sub>Si)/Mg Matrix Composites:** *Xiao Ma*<sup>1</sup>; Roy Kusuma<sup>1</sup>; Salin Kuplin<sup>1</sup>; David Johnson<sup>1</sup>; Kevin Trumble<sup>1</sup>; <sup>1</sup>Purdue University



## Professor K. K. Chawla Honorary Symposium on Fibers, Foams and Composites: Science and Engineering: Foams I

*Program Organizers:* Nikhilesh Chawla, Arizona State University; Aldo Boccaccini, University of Erlangen-Nuremberg; Gary Gladysz, Trelleborg USA; Pedro D. Portella, Federal Institute of Testing and Materials BAM

Monday PM  
October 17, 2011  
Room: D234  
Location: Columbus Con. Center

*Session Chairs:* Aldo Boccaccini, University of Erlangen-Nuremberg; Kanika Chawla, Cellerant Therapeutics

**2:00 PM Introductory Comments A Brief Overview of Prof. Chawla's Career**

**2:20 PM Keynote**  
**Fibers, Foams, and Composites: Where Do We Stand?:** *Krishan Chawla*<sup>1</sup>;  
<sup>1</sup>University of Alabama at Birmingham

**3:00 PM Invited**  
**Core Courses in Materials Science and Engineering:** *Morris Fine*<sup>1</sup>;  
Kathleen Stair<sup>1</sup>; <sup>1</sup>Northwestern University

**3:20 PM Break**

**3:40 PM Invited**  
**Biomaterials for Tissue Engineering and Regenerative Medicine: Treatment of Musculoskeletal Injury and Disease:** *Kanika Chawla*<sup>1</sup>;  
<sup>1</sup>University of California, Irvine

**4:20 PM Invited**  
**Advances in the Development of Composite Porous Structures for Bone Tissue Engineering:** *Aldo Boccaccini*<sup>1</sup>; <sup>1</sup>University of Erlangen-Nuremberg

**5:00 PM**  
**Processing, Microstructure and Mechanical Properties of Reticulated Titanium Scrolls:** *Eunji Hong*<sup>1</sup>; *Bok Ahn*<sup>2</sup>; *D Shoji*<sup>2</sup>; *Jennifer Lewis*<sup>2</sup>; *David Dunand*<sup>3</sup>; <sup>1</sup> Kookmin University; <sup>2</sup>University of Illinois at Urbana-Champaign; <sup>3</sup>Northwestern University

## Semiconductor Heterostructures: Theory, Growth, Characterization and Device Applications: Session I

*Program Organizer:* John Ayers, University of Connecticut

Monday PM  
October 17, 2011  
Room: C221  
Location: Columbus Con. Center

*Session Chair:* John Ayers, University of Connecticut

**2:00 PM**  
**Effects of Equi-Biaxial In-Plane Strains on GaN Thin Films and InGaN/GaN Superlattices:** *Liang Dong*<sup>1</sup>; *S. Pamir Alpay*<sup>1</sup>; <sup>1</sup>University of Connecticut

**2:20 PM**  
**La<sub>0.7</sub>Ca<sub>0.3</sub>MnO<sub>3</sub>/SiO<sub>2</sub>/n-Si and La<sub>0.7</sub>Sr<sub>0.3</sub>MnO<sub>3</sub>/ SiO<sub>2</sub>/p-Si MOS Like Heterostructures for Spintronics Application:** *Tapan Nath*<sup>1</sup>; *S Chattopadhyay*<sup>1</sup>; *S Giri*<sup>1</sup>; <sup>1</sup>Indian Institute of Technology Kharagpur

**2:40 PM**  
**Dynamical X-ray Diffraction from Semiconductor Heterostructures with Dislocations:** *Paul Rago*<sup>1</sup>; *John Ayers*<sup>1</sup>; <sup>1</sup>University of Connecticut

**3:00 PM**

**Influence of Dimer Tilting on Strain-Dependent Vicinal Ge (1,1,10) Surface Energies from First Principles:** *Daniele Scopece*<sup>1</sup>; *Francesco Montalenti*<sup>1</sup>; *Leo Miglio*<sup>1</sup>; *Matthew Beck*<sup>2</sup>; <sup>1</sup>L-NESS and Dept. of Materials Science, University of Milano-Bicocca; <sup>2</sup>Dept. of Chemical & Materials Engineering, University of Kentucky

**3:20 PM Break**

**3:40 PM**

**Plastic Flow and Threading Dislocations in Semiconductor Heterostructures:** *Tedi Kujofsa*<sup>1</sup>; *Sushma Cheruku*<sup>1</sup>; *Brian Outlaw*<sup>1</sup>; *Sirjan Xhurshi*<sup>1</sup>; *Francis Obst*<sup>1</sup>; *David Sidoti*<sup>1</sup>; *Brandon Bertoli*<sup>1</sup>; *Paul Rago*<sup>1</sup>; *Ernesto Suarez*<sup>2</sup>; *Faquir Jain*<sup>1</sup>; *John Ayers*<sup>1</sup>; *Xiaoguang Zhang*<sup>2</sup>; *Peng Li*<sup>3</sup>; <sup>1</sup>University of Connecticut; <sup>2</sup>Veeco TurboDisc; <sup>3</sup>East Carolina University

**4:00 PM**

**Gas Sensing Concept of Metal Oxide Gas Sensors:** *Amir Masoud Soleimanpour*<sup>1</sup>; <sup>1</sup>Sharif University Of Technology

**4:20 PM**

**Combined Experimental and Phase-Field Simulation Approach to Study Morphology of InGaN Quantum Dots Grown by Selective Area Epitaxy:** *Larry Aagesen*<sup>1</sup>; *Leung Lee*<sup>1</sup>; *Pei-Cheng Ku*<sup>1</sup>; *Katsuyo Thornton*<sup>1</sup>; <sup>1</sup>University of Michigan

**4:40 PM**

**Microstructural Studies of Quantum Dots in a ZnSe/ZnTe Heterostructure:** *Sung Joo Kim*<sup>1</sup>; *Weiming Wang*<sup>2</sup>; *Jake Jokisaari*<sup>1</sup>; *Kui Zhang*<sup>1</sup>; *Jamie Phillips*<sup>2</sup>; *Xiaoqing Pan*<sup>1</sup>; <sup>1</sup>Department of Materials Science and Engineering at University of Michigan; <sup>2</sup>Department of Electrical Engineering and Computer Science at University of Michigan

**5:00 PM**

**Space- and Time-Resolved Cathodoluminescence to Study ZnO Nanobelts:** *Pierre Corfdir*<sup>1</sup>; *Samuel Sonderegger*<sup>2</sup>; *Mohamed Abid*<sup>1</sup>; *Jean-Daniel Ganière*<sup>1</sup>; *Benoit Deveaud-Plédran*<sup>1</sup>; <sup>1</sup>EPFL; <sup>2</sup>Attolight

## Shape Memory Alloys: Advanced Alloys

*Program Organizer:* Mohammad Elahinia, University of Toledo

Monday PM  
October 17, 2011  
Room: D242/243  
Location: Columbus Con. Center

*Session Chair:* Haluk Karaca, University of Kentucky

**2:00 PM**

**Effect of Equal Channel Angular Extrusion (ECAE) Processing on Transition Temperature of Ti-20Ni-30Pd Shape Memory Alloy:** *Rabindra Mahapatra*<sup>1</sup>; *Chrls Lei*<sup>1</sup>; <sup>1</sup>NAVAIR

**2:20 PM**

**High Temperature Shape Memory Behavior of NiTiHf Poly and Single Crystals:** *Haluk Karaca*<sup>1</sup>; *Burak Basaran*<sup>1</sup>; *Sayed Saghaian*<sup>1</sup>; *Ronald Noebe*<sup>2</sup>; *Hans Maier*<sup>3</sup>; <sup>1</sup>UNIVERSITY OF KENTUCKY; <sup>2</sup>NASA; <sup>3</sup>University of Paderborn

**2:40 PM**

**Precipitate Phases in Several High Temperature Shape Memory Alloys:** *Fan Yang*<sup>1</sup>; *Libor Kovarik*<sup>2</sup>; *Limei Yang*<sup>1</sup>; *Ronald Noebe*<sup>3</sup>; *Michael Mills*<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Pacific Northwest National Laboratory; <sup>3</sup>NASA Glenn Research Center

**3:00 PM**

**Stoichiometry and Aging Effects on the Microstructure and Properties of Nickel Rich NiTiHf Shape Memory Alloys:** *Daniel Coughlin*<sup>1</sup>; Ronald Noebe<sup>2</sup>; Glen Bigelow<sup>2</sup>; Anita Garg<sup>2</sup>; Michael Mills<sup>1</sup>; <sup>1</sup>Ohio State University; <sup>2</sup>NASA Glenn Research Center

**3:20 PM Break****3:40 PM**

**Understanding Precipitate Effects on the Performance of Shape Memory Alloys:** *Xiang Chen*<sup>1</sup>; Daniel Coughlin<sup>1</sup>; Glen Bigelow<sup>2</sup>; Ronald Noebe<sup>2</sup>; Fan Yang<sup>1</sup>; Michael Mills<sup>1</sup>; Peter Anderson<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>NASA Glenn Research Center

**4:00 PM**

**The Magnetocaloric Effect in Ni-Co-Mn-Ga Heusler Alloys:** *Mikhail Drobosyuk*<sup>1</sup>; Vasily Buchelnikov<sup>1</sup>; Sergey Taskaev<sup>1</sup>; <sup>1</sup>Chelyabinsk State University

**4:20 PM**

**Characterization of Defects Generated during the Martensitic Transformation in Pseudoelastically-Deformed NiTi Microcrystals:** *Matthew Bowers*<sup>1</sup>; Michael Mills<sup>1</sup>; Sivom Manchiraju<sup>1</sup>; Peter Anderson<sup>1</sup>; Michael Uchic<sup>2</sup>; Peter Sarosi<sup>3</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Air Force Research Labs RXLM; <sup>3</sup>General Motors

**4:40 PM**

**Shape Memory Behavior of Heat Treated Ni60Ti40 (wt%):** Haluk Karaca<sup>1</sup>; Burak Basaran<sup>1</sup>; *Irhan Kaya*<sup>1</sup>; <sup>1</sup>UNIVERSITY OF KENTUCKY

**5:00 PM**

**Effect of Atomic Ordering on the Magnetic Behavior of Co<sub>2</sub>NiGa Alloys:** *Navdeep Singh*<sup>1</sup>; Raymundo Arroyave<sup>1</sup>; <sup>1</sup>Texas A&M University

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## **Steel Product Metallurgy and Applications: Advanced High Strength Steels I**

*Program Organizer:* Bhaskar Yalamanchili, Gerdau Ameristeel.com

Monday PM  
October 17, 2011

Room: D132  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

**2:00 PM**

**Austenite Stability in Multi-Phase Ultrafine-Grained 6 pct Mn Transformation-Induced Plasticity Steel:** *Seok-Jae Lee*<sup>1</sup>; Seawoong Lee<sup>1</sup>; Bruno De Cooman<sup>1</sup>; <sup>1</sup>Pohang University of Science and Technology

**2:20 PM**

**Effect of Annealing Conditions on Microstructure and Tensile Properties of Low Carbon, Niobium-Added High Manganese TRIP-Aided Steel Sheet:** *Chang-Seok Oh*<sup>1</sup>; Chan Hee Park<sup>1</sup>; Seong-Jun Park<sup>1</sup>; <sup>1</sup>Korea Institute of Materials Science

**2:40 PM**

**Alloy Design for Fundamental Study of Quenched and Partitioned Steels:** *Grant Thomas*<sup>1</sup>; John Speer<sup>1</sup>; David Matlock<sup>1</sup>; Emmanuel De Moor<sup>1</sup>; Luis Garza<sup>2</sup>; <sup>1</sup>Colorado School of Mines; <sup>2</sup>AK Steel Corporation

**3:00 PM**

**Development of Lightweight Duplex Steels for Autobody:** *Jai-hyun Kwak*<sup>1</sup>; <sup>1</sup>POSCO

**3:20 PM Break****3:40 PM**

**Increased Austenite Content in AHSS through Dual-Stabilization Thermal Processing:** *Gary Michal*<sup>1</sup>; Hao Qu<sup>1</sup>; Arthur Heuer<sup>1</sup>; <sup>1</sup>Case Western Reserve Univ.

**4:00 PM**

**Effect of Retained Austenite on Tensile Behavior of AHSS Revisited:** *Emmanuel De Moor*<sup>1</sup>; John Speer<sup>1</sup>; David Matlock<sup>1</sup>; David Hanlon<sup>2</sup>; <sup>1</sup>ASPPRC Colorado School of Mines; <sup>2</sup>Tata Steel Research Development & Technology

**4:20 PM**

**Effect of the Strain Rate on the Deformation Mechanism in a 12 pct Mn Austenitic Steel:** *Sang Won Lee*<sup>1</sup>; Seok-Jae Lee<sup>1</sup>; Bruno C. De Cooman<sup>1</sup>; <sup>1</sup>GIFT. POSTECH

**4:40 PM**

**New Strategies to Control Deformation Response and Flow Behavior of Twinning Induced Plasticity (TWIP) Steels:** *Alireza Saeed-Akbari*<sup>1</sup>; Wolfgang Bleck<sup>1</sup>; <sup>1</sup>RWTH Aachen University

**5:00 PM**

**Effect of Initial Microstructure and Parameters of Annealing of 4% and 6.7% Mn steels on the Evolution of Microstructure and Mechanical Properties:** *Hyun Jo Jun*<sup>1</sup>; Oleg Yakubovsky<sup>1</sup>; Nina Fonstein<sup>1</sup>; <sup>1</sup>ArcelorMittal Global R&D - East Chicago

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## **Student Career Development: Session I**

*Program Organizers:* Jaime George, Missouri University of Science and Technology; David Shahin, Missouri University of Science and Technology

Monday PM  
October 17, 2011

Room: C213  
Location: Columbus Con. Center

*Session Chair:* Kevin Strong, University of Washington

**2:00 PM Invited**

**Leadership Skills for Engineering Graduates:** *Doreen Edwards*<sup>1</sup>; <sup>1</sup>Alfred University

**2:20 PM**

**Career Opportunities in the Forging Industry:** *Carola Sekreter*<sup>1</sup>; <sup>1</sup>Forging Industry Association

**2:40 PM Invited**

**The Importance of Self and Global Awareness in Professional Development:** *Robert Schwartz*<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology

**3:00 PM Invited**

**Life as a Professor – The Greatest Job in the World:** *Wayne Huebner*<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology

**3:20 PM Break****3:40 PM**

**Transitioning from Student to Professional:** *Seth Berbano*<sup>1</sup>; <sup>1</sup>The Pennsylvania State University

**4:00 PM**

**Career Panel Discussion:** Jaime George<sup>1</sup>; *Dan Buck*<sup>2</sup>; <sup>1</sup>Missouri University of Science and Technology; <sup>2</sup>University of Washington

## Surface Properties of Biomaterials: Drug Delivery

*Program Organizers:* Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Thomas Webster, Brown University; Sharmila Mukhopadhyay, Wright State University; Paul Calvert, University of Massachusetts; Mukesh Kumar, Biomet Inc

Monday PM  
October 17, 2011

Room: C216  
Location: Columbus Con. Center

*Session Chairs:* Susmita Bose, Washington State University; Ryan Roeder, University of Notre Dame

### 2:00 PM Invited

**Surface Functionalized Nanoparticles for Targeted Delivery and Enhanced X-Ray Contrast:** Ryan Ross<sup>1</sup>; Matthew Meagher<sup>1</sup>; Lisa Cole<sup>1</sup>; Ryan Roeder<sup>1</sup>; <sup>1</sup>University of Notre Dame

### 2:40 PM

**Plasma Surface Modification of Electrospun Fibers for Adhesion-Based Cancer Cell Sorting:** Britani Blackstone<sup>1</sup>; James Willard<sup>1</sup>; Tyler Nelson<sup>1</sup>; Carol Lee<sup>1</sup>; John Lannutti<sup>1</sup>; Heather Powell<sup>1</sup>; <sup>1</sup>The Ohio State University

### 3:00 PM

**Calcium Phosphate System in Drug and Protein Delivery for Bone Tissue Engineering:** Susmita Bose<sup>1</sup>; Solaiman Tarafder<sup>1</sup>; Joe Edgington<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; <sup>1</sup>Washington State University

### 3:20 PM Break

### 3:40 PM Invited

**Protonated Nanoparticle Surface in Cellular Targeting:** S Seal<sup>1</sup>; A Vincent<sup>2</sup>; W Self<sup>1</sup>; C Reilly<sup>3</sup>; S Das<sup>1</sup>; <sup>1</sup>UCF; <sup>2</sup>U Alberta; <sup>3</sup>Virginia Tech

### 4:20 PM

**Biological Response of 3D Printed SiO<sub>2</sub> and ZnO Doped 946-TCP Scaffolds:** Gary Fielding<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; Susmita Bose<sup>1</sup>; <sup>1</sup>Washington State University

### 4:40 PM Invited

**The Multiple Uses of Carbon Nanotubes in Regenerative Medicine:** Thomas Webster<sup>1</sup>; <sup>1</sup>Brown University

## Surface Protection for Enhanced Materials Performance: Science and Technology: Wear-Resistant and Tribological Coatings

*Program Organizers:* Rodney Trice, Purdue University; Dongming Zhu, NASA Glenn Research Center; Daniel Mumm, University of California-Irvine; Hua-Tay Lin, Oak Ridge National Laboratory; Pravansu Mohanty, University of Michigan; Yutaka Kagawa, The University of Tokyo; Kang Lee, Rolls Royce; Charles Kay, ASB Industries, Inc.; Luc Pouliot, TECNAR Automation Ltd.

Monday PM  
October 17, 2011

Room: D230  
Location: Columbus Con. Center

*Session Chairs:* Rodney Trice, Purdue University; Douglas Wolfe, Penn State

### 2:00 PM Invited

**Erosion Resistant Coatings for the Suppression of Leading Edge Burr: Modeling and Testing:** Douglas Wolfe<sup>1</sup>; <sup>1</sup>The Penn State University

### 2:40 PM

**Slurry Erosion Resistance of Overlays Containing Boride Crystals Oriented Perpendicularly to the Wearing Surface:** SERGE DALLAIRE<sup>1</sup>; <sup>1</sup>SYNTHESARC INC.

### 3:00 PM

**Mechanical and Physical Properties of Carbon S-Phase on Stainless Steel, Produced by Carbon Supersaturation:** Ralph Hunger<sup>1</sup>; <sup>1</sup>Bodycote Hardiff GmbH

### 3:20 PM Break

### 3:40 PM Invited

**Wear Resistant Hard Facing and Cutting Assistant Hard Coating in Oil and Gas Drilling Applications:** Jing Xu<sup>1</sup>; Hendrik John<sup>1</sup>; Denis Kopecki<sup>1</sup>; <sup>1</sup>Baker Hughes

### 4:20 PM

**Development of Economical Multifunctional Composite Coating for Energy Efficient Sliding Systems:** Sudeep Ingole<sup>1</sup>; Masatoshi Kuniyoshi<sup>1</sup>; Rajeshwari Paluri<sup>1</sup>; <sup>1</sup>Texas A&M University

### 4:40 PM

**Diamond Coated Mechanical Seals in Working Conditions: Wear Performance Evaluation:** José Santos<sup>1</sup>; Victor Neto<sup>1</sup>; David Ruch<sup>2</sup>; José Grácio<sup>1</sup>; <sup>1</sup>Department of Mechanical Engineering, Centre for Mechanical Technology & Automation, University of Aveiro; <sup>2</sup>Department of Advanced Materials and Structures, Centre de Recherche Public Henri Tudor

### 5:00 PM

**Performance of Nanocrystalline Diamond Coated Micromolding Tools:** Victor Neto<sup>1</sup>; Mónica Oliveira<sup>1</sup>; José Grácio<sup>1</sup>; <sup>1</sup>University of Aveiro

### 5:20 PM

**Sliding Wear Behavior of Ni-Al Coatings Processed In-Situ by Plasma Transferred Arc:** Cristiano Brunetti<sup>1</sup>; Felipe Mendes<sup>2</sup>; Giuseppe Pintaude<sup>2</sup>; Ana Sofia D'Oliveira<sup>1</sup>; <sup>1</sup>UFPR - Federal University of Paraná; <sup>2</sup>UTFPR - Technological University of Paraná

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## ACerS Arthur L. Friedberg Memorial Lecture

Tuesday AM  
October 18, 2011

Room: C113/114  
Location: Columbus Con. Center

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### 8:00 AM

**Processing Dielectric Oxides—New Opportunities and Challenges:** *Clive Randall*<sup>1</sup>; <sup>1</sup>Penn State University

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## Additive Manufacturing of Metals: Electron Beam Melting (EBM) I

*Program Organizers:* Ian D. Harris, EWI; Ulf Ackelid, Arcam AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, Ohio State University; Brent Stucker, University of Louisville

Tuesday AM  
October 18, 2011

Room: D130  
Location: Columbus Con. Center

*Session Chair:* Ulf Ackelid, Arcam AB

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### 8:00 AM

**Additive Layer Manufacture of Titanium Components – From Lab to Production:** *Iain Todd*<sup>1</sup>; <sup>1</sup>University of Sheffield

### 8:40 AM

**Characterization and Comparison of Electron Beam Melting (EBM) Produced Ti-6Al-4V Parts Using Two Different Powder Fractions:** *Joakim Karlsson*<sup>1</sup>; Sanna Fager Franzen<sup>2</sup>; Anders Snis<sup>2</sup>; Erik Unosson<sup>3</sup>; Håkan Engqvist<sup>3</sup>; Jukka Lausmaa<sup>1</sup>; <sup>1</sup>SP Technical Research Institute of Sweden; <sup>2</sup>Arcam AB; <sup>3</sup>Uppsala University

### 9:00 AM

**Characterization of Ti6Al4V 3D Auxetic Structures Fabricated via the Electron Beam Melting Process:** *Li Yang*<sup>1</sup>; Ola Harrysson<sup>1</sup>; Harvey West<sup>1</sup>; Denis Cormier<sup>2</sup>; <sup>1</sup>North Carolina State University; <sup>2</sup>Rochester Institute of Technology

### 9:20 AM Break

### 9:40 AM

**Design and Customization of a Golf Club Using Electron Beam Melting:** *Phillip Ray*<sup>1</sup>; Gilbert Chahine<sup>1</sup>; Radovan Kovacevic<sup>1</sup>; Pauline Smith<sup>2</sup>; <sup>1</sup>Southern Methodist University RCAM; <sup>2</sup>Army Research Laboratory

### 10:00 AM

**TiAl Manufacturing Using an Arcam A2 Electron Beam Melting System:** *Medina Francisco*<sup>1</sup>; Jennifer Hernandez<sup>1</sup>; Larry Murr<sup>1</sup>; Ryan Wicker<sup>1</sup>; <sup>1</sup>UTEP

### 10:20 AM

**Thermal, Residual Stress and Process Control Simulation of Additive Manufacturing Processes:** *Anil Chaudhary*<sup>1</sup>; *Matt Keller*<sup>1</sup>; <sup>1</sup>Applied Optimization, Inc.

### 10:40 AM

**Digital Manufacturing of Gamma-TiAl by Electron Beam Melting:** *John Porter*<sup>1</sup>; John Wooten<sup>2</sup>; Ola Harrysson<sup>3</sup>; Kyle Knowlson<sup>3</sup>; <sup>1</sup>University of California Santa Barbara; <sup>2</sup>CalRAM Inc.; <sup>3</sup>North Carolina State University

### 11:00 AM

**Metallic Part Fabrication Using Selective Inhibition Sintering (SIS):** *Berok Khoshnevis*<sup>1</sup>; Mahdi Yoozbashizadeh<sup>1</sup>; Yong Chen<sup>1</sup>; <sup>1</sup>USC

### 11:20 AM

**Microstructure and Mechanical Properties Evolution of Biomedical Co-Cr-Mo Alloys Produced by EBM Method during Novel Heat Treatment:** *Shingo Kurosu*<sup>1</sup>; Hiroaki Matsumoto<sup>1</sup>; Yunping Li<sup>1</sup>; Yuichiro Koizumi<sup>1</sup>; *Akihiko Chiba*<sup>1</sup>; <sup>1</sup>Tohoku University

### 11:40 AM Panel Discussion

### 12:00 PM Cancelled

**An Experimentally Validated Constitutive Model for EBM Gamma-TiAl:** *Lorenzo Valdevit*<sup>1</sup>; Scott Godfrey<sup>1</sup>; John Porter<sup>2</sup>; John Wooten<sup>3</sup>; <sup>1</sup>University of California, Irvine; <sup>2</sup>University of California, Santa Barbara; <sup>3</sup>CalRAM Inc.

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## Advanced Protective Coatings for Refractory Metals and Alloys: Recent Development in Oxidation Resistant Refractory Metal Alloys, Composites and Protective Coating Materials II

*Program Organizers:* Ridwan Sakidja, University of Wisconsin-Madison; Brian Cockeram, Bechtel-Bettis

Tuesday AM  
October 18, 2011

Room: D231  
Location: Columbus Con. Center

*Funding support provided by:* WARF (Wisconsin Alumni Research Foundation)

*Session Chair:* John Perepezko, University of Wisconsin-Madison

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### 8:00 AM Invited

**The Potential of Nb-Si Alloys for Advanced Turbine Applications:** *B. P. Bewlay*<sup>1</sup>; <sup>1</sup>GE Global Research

### 8:40 AM Invited

**Phase Stability in the Metal (Me) Rich Region of Me-Si-B Systems (Me = Transition Metal of IVA, VA, VIA Groups):** *Carlos Angelo Nunes*<sup>1</sup>; Gilberto Carvalho Coelho<sup>2</sup>; Paulo Atsushi Suzuki<sup>1</sup>; <sup>1</sup>Universidade de São Paulo (USP); <sup>2</sup>Universidade de São Paulo (USP) - and - UniFoa – Centro Universitário de Volta Redonda

### 9:20 AM

**Effect of Al on the Oxidation Resistance of Alloys from Nb-Si-Cr System:** *Nydia Esparza*<sup>1</sup>; Shailendra Varma<sup>1</sup>; <sup>1</sup>The University of Texas at El Paso

### 9:40 AM Break

### 10:00 AM Invited

**Phase Formation and Oxidation Resistance of Mo-Si-B Alloys:** *Kyosuke Yoshimi*<sup>1</sup>; Seong-Ho Ha<sup>1</sup>; Kouichi Maruyama<sup>1</sup>; Naoyuki Nomura<sup>2</sup>; Shuji Hanada<sup>1</sup>; <sup>1</sup>Tohoku University; <sup>2</sup>Tokyo Medical and Dental University

### 10:40 AM Invited

**Water Vapor Effects on the Volatility of Borides, Silicides and Aluminides for Refractory Alloy Coatings:** *Elizabeth Opila*<sup>1</sup>; <sup>1</sup>University of Virginia

### 11:20 AM

**Development of Bond Coatings for Titanium Aluminide Intermetallics:** *Kai Tan*<sup>1</sup>; Viola Acoff<sup>1</sup>; <sup>1</sup>The University of Alabama

### 11:40 AM

**Interaction between CMAS and Mo-Si-B Coatings:** *Irena Downs*<sup>1</sup>; Ridwan Sakidja<sup>1</sup>; Travis Sossaman<sup>1</sup>; John Perepezko<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

## Advances in Dielectric Materials and Electronic Devices: Materials Preparation and Properties

Program Organizer: K. M. Nair, E.I.duPont de Nemours & Co, Inc

Tuesday AM  
October 18, 2011

Room: C220  
Location: Columbus Con. Center

Session Chairs: D Suvorov, Josef Stefan Institute; A Bhalla, University of Texas @ San Antonio

### 8:00 AM

**Influence of Preparation Conditions on Distinctive Contributions to Dielectric Behavior of  $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$  Thin Films:** Andreja Eršte<sup>1</sup>; Barbara Malic<sup>1</sup>; Brigita Kužnik<sup>1</sup>; Marija Kosec<sup>1</sup>; Vid Bobnar<sup>1</sup>; Jozef Stefan Institute

### 8:20 AM

**Mechanochemical Behavior of  $\text{BaNd}_2\text{Ti}_4\text{O}_{12}$  Powder in Ball Milling for Microwave Applications:** Yi Tong Shi<sup>1</sup>; Jin E Mu<sup>1</sup>; Feng Yuan<sup>1</sup>; <sup>1</sup>Tianjin Polytechnic University

### 8:40 AM Invited

**Mn Doping Effect on Electrical Properties of Lead-Free  $\text{K}0.5\text{Na}0.5\text{NbO}_3$  Thin Films:** Wataru Sakamoto<sup>1</sup>; Takumi Matsuda<sup>1</sup>; Yoshifumi Nakashima<sup>1</sup>; Bong-Yeon Lee<sup>2</sup>; Takashi Iijima<sup>2</sup>; Makoto Moriya<sup>1</sup>; Toshinobu Yogo<sup>1</sup>; <sup>1</sup>Nagoya University; <sup>2</sup>AIST

### 9:00 AM Invited

**Phase Evolution and Microwave Dielectric Properties of  $\text{MgO-B}_2\text{O}_3\text{-SiO}_2$  Based Glass-Ceramics:** Danilo Suvorov<sup>1</sup>; Urban Dosler<sup>1</sup>; Marjeta Macek Krzmann<sup>1</sup>; <sup>1</sup>Jozef Stefan Institute

### 9:20 AM Invited

**Sodium Bismuth Titanate Ceramics Prepared by Magnetic Field and Subsequent Reaction Sintering:** Satoshi Tanaka<sup>1</sup>; Yutaka Doshida<sup>2</sup>; Hiroyuki Shimizu<sup>2</sup>; Keizo Uematsu<sup>1</sup>; <sup>1</sup>Nagaoka University of Technology; <sup>2</sup>Taiyo Yuden Co. Ltd.

### 9:40 AM Break

### 10:00 AM

**Study of the Surface-Modifying Techniques for Localized Erbium Doping into Various Cuts of Lithium Niobate:** Pavla Nekvindova<sup>1</sup>; Blanka Svecova<sup>1</sup>; Jakub Cajzl<sup>1</sup>; Anna Mackova<sup>2</sup>; Petr Malinsky<sup>2</sup>; Jiri Vacik<sup>2</sup>; Jiri Oswald<sup>3</sup>; Andreas Kolitsch<sup>4</sup>; Jarmila Spirkova<sup>1</sup>; <sup>1</sup>Institute of Chemical Technology in Prague; <sup>2</sup>Nuclear Physic Institute, Academy of Sciences of the Czech Republic, v.v.i.; <sup>3</sup>Institute of Physics, Czech Academy of Sciences; <sup>4</sup>Institute of Ion Beam Physics and Materials Research, Forschungszentrum Rossendorf

### 10:20 AM

**Crystal Structure Ordering and Quality Factor on Microwave Dielectrics:** Hitoshi Ohsato<sup>1</sup>; <sup>1</sup>Hoseo University, Nagoya Research Institute and Nagoya Institute of Technology

### 10:40 AM

**Comparison of Donor and Acceptor Doping Effects on the Strain Enhancement of Bi-Perovskite Lead-Free Ceramics:** Jae-Shin Lee<sup>1</sup>; Hyoun-Su Han<sup>1</sup>; Vu Diem Ngoc Tran<sup>1</sup>; Han-Bok Lee<sup>1</sup>; Nam-Binh Do<sup>1</sup>; <sup>1</sup>University of Ulsan

### 11:00 AM Invited

**Crystal Structure and Dielectric Properties of Filled Tungsten Bronze Ceramics:** Xiaoli Zhu<sup>1</sup>; Xiaoqiang Liu<sup>1</sup>; Xiangming Chen<sup>1</sup>; <sup>1</sup>Zhejiang University

### 11:20 AM

**Effect of Internal Stresses on the Dielectric Properties of Core/Shell-Grained  $\text{BaTiO}_3$ :** Sang-Chae Jeon<sup>1</sup>; Chul-Seung Lee<sup>2</sup>; Suk-Joong L. Kang<sup>1</sup>; <sup>1</sup>Korea Advanced Institute of Science and Technology; <sup>2</sup>Samsung Electro-Mechanics

### 11:40 AM

**Preparation and Microstructural, Dielectric and Electro-Optical Properties of (1-x)PLMN-xPT Transparent Ceramics:** Ducinei Garcia<sup>1</sup>; José Eiras<sup>1</sup>; Fernando Badillo<sup>1</sup>; <sup>1</sup>Federal University of São Carlos

### 12:00 PM

**The Effect of Spark Plasma Sintering on the Dielectric Behavior of Nanostructured Barium Titanate:** Sundararajan Thirumalai<sup>1</sup>; Manisha Vidyavathy S<sup>1</sup>; Balasivanandha Prabu S<sup>2</sup>; Jothamani S<sup>2</sup>; Arvind Joshua Jayadev S<sup>2</sup>; <sup>1</sup>Alagappa Chettiar College of Technology; <sup>2</sup>College of Engineering Guindy

## Advances in Manufacturing Technologies: Forming, Shaping and Issues

Program Organizer: Muammer Koc, Istanbul Sehir University

Tuesday AM  
October 18, 2011

Room: D144/145  
Location: Columbus Con. Center

Session Chair: Omer Cora, VCU / KTU

### 8:00 AM

**Applications for Applying High Axial Compression Stress to Moving Wires:** Alfred Austen<sup>1</sup>; Innovare, Inc.

### 8:20 AM Cancelled

**Experimental Hot Stamping of 4140 Steel Sheet:** Mohammad Habibi Parsa<sup>1</sup>; Pedram Samadian<sup>1</sup>; Amid Shakeri<sup>2</sup>; <sup>1</sup>University of Tehran

### 8:40 AM

**Formability of LZ Magnesium-Alloy Sheets:** Fuh-Kuo Chen<sup>1</sup>; Chi-Jay Liao<sup>1</sup>; <sup>1</sup>National Taiwan University

### 9:00 AM

**High Strain Rate Shaping of Lightweight Materials Using Die Impact-Geometry Assisted Forming:** Timothy Windholtz<sup>1</sup>; Glenn Daehn<sup>1</sup>; <sup>1</sup>The Ohio State University

### 9:20 AM Break

### 9:40 AM

**Investigation on Bulge Forming of Friction Stir Welded Aluminum 7075-O at Elevated Temperatures:** Mehmet KARALI<sup>1</sup>; Ömer Cora<sup>2</sup>; Muammer KOÇ<sup>2</sup>; Vien Nguyen<sup>3</sup>; Dwight Burford<sup>4</sup>; <sup>1</sup>Karabük University; <sup>2</sup>Virginia Commonwealth University; <sup>3</sup>National Institute for Aviation Research, Wichita State University; <sup>4</sup>National Institute for Aviation Research, Wichita State University

### 10:00 AM

**Performance Evaluation of Stamping Die Coatings via Ring-on-Flat Type Wear Tester:** Ömer Cora<sup>1</sup>; Ali Agcayazi<sup>2</sup>; Donald Adamski<sup>3</sup>; Jody Hall<sup>3</sup>; Muammer Koc<sup>1</sup>; <sup>1</sup>Virginia Commonwealth University; <sup>2</sup>Karadeniz Technical University; <sup>3</sup>General Motors

### 10:20 AM

**Selective Superplastic Forming of Friction Stir Processed 2014 Al Alloy:** preetam anbukarasu<sup>1</sup>; <sup>1</sup>College of Engineering Guindy



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## Ceramic Matrix Composites: Environmental Effects/Coatings

*Program Organizers:* Narottam Bansal, NASA Glenn Research Center; J. P. Singh, U.S. Army Research Laboratory; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Tuesday AM                      Room: C112  
October 18, 2011              Location: Columbus Con. Center

*Session Chair:* Marina Ruggles-Wrenn, Air Force Institute of Technology

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### 8:00 AM Invited

**Effects of Environment on Mechanical Behavior of an Oxide-Oxide Ceramic Matrix Composite at Elevated Temperature:** *Marina Ruggles-Wrenn*<sup>1</sup>; <sup>1</sup>Air Force Institute of Technology

### 8:40 AM Invited

**Probing Ceramic Composites under Extreme Environments:** *Frank Zok*<sup>1</sup>; <sup>1</sup>University of California, Santa Barbara

### 9:20 AM

**Effects of CMAS Exposure on Ceramic Matrix Composites at Elevated Temperatures:** *Sung Choi*<sup>1</sup>; David Faucett<sup>1</sup>; <sup>1</sup>Naval Air Systems Command

### 9:40 AM Break

### 10:00 AM Invited

**Stressed-Oxidation of SiC/SiC Ceramic Matrix Composites:** *Gregory Morscher*<sup>1</sup>; <sup>1</sup>University of Akron

### 10:40 AM

**High Temperature Oxidation Behavior of Carbide Based Cermet Composites: Effect of Sintering Temperature and Porosity:** Ali OZER<sup>1</sup>; Yahya TÜR<sup>1</sup>; Waltraud KRIVEN<sup>2</sup>; <sup>1</sup>Gebze Institute of Technology; <sup>2</sup>University of Illinois at U-C

### 11:00 AM

**Environmental Barrier Coating (EBC) Durability Modeling; An Overview and Preliminary Analysis:** *Ali Aziz*<sup>1</sup>; <sup>1</sup>NASA Glenn Research Center/CSU

### 11:20 AM

**High-Temperature Oxidation of Spark Plasma Sintered Ti2AlN Ceramics:** *Bai Cui*<sup>1</sup>; Daniel Jayaseelan<sup>1</sup>; Michael Reece<sup>2</sup>; William Lee<sup>1</sup>; <sup>1</sup>Imperial College London; <sup>2</sup>Queen Mary, University of London

### 11:40 AM

**Effect of wt % Boron on the Formation of In-Situ Phases and Mechanical and Surface Properties of Alumina Composites for Energy Efficient Sliding Systems:** *Rajeshwari Paluri*<sup>1</sup>; *Sudeep Ingole*<sup>1</sup>; <sup>1</sup>Texas A&M University

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## Characterization and Modeling of the Performance of Advanced Alloys for the Transportation Industry -- Bridging the Data Gap II: Assessing the Technical Challenges with Advanced Lightweight Alloys

*Program Organizers:* Mark Stoudt, National Institute of Standards and Technology; Adam Creuziger, National Institute of Standards and Technology; John Carsley, General Motors; Michael Miles, BYU; Kip Findley, Colorado School of Mines

Tuesday AM                      Room: D131  
October 18, 2011              Location: Columbus Con. Center

*Session Chair:* Mark Stoudt, NIST

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### 8:00 AM Keynote

**The Impact of Microstructurally Based Materials Modeling on the Design and Manufacturing of Structural Automotive Components:** *David Wilkinson*<sup>1</sup>; Raj Mishra<sup>2</sup>; <sup>1</sup>McMaster University; <sup>2</sup>General Motors Research and Development Center

### 8:40 AM Invited

**Materials Development for Vehicle Weight Reduction and the Impacts on Energy Efficiency:** *William Joost*<sup>1</sup>; <sup>1</sup>U.S. Department of Energy

### 9:20 AM Question and Answer Period

### 9:40 AM Break

### 10:00 AM Invited

**Bridging the Design-Manufacturing-Materials Data Gap: Materials Properties for Optimum Design and Manufacturing Performance in Light Steel-Intensive Vehicles:** *Blake Zuidema*<sup>1</sup>; <sup>1</sup>ArcelorMittal

### 10:40 AM Invited

**From Atoms to Autos: Bridging the Length Scale Gap in Materials Modeling:** *Louis Hector Jr*<sup>1</sup>; Paul Krajewski<sup>2</sup>; <sup>1</sup>GM R&D Center; <sup>2</sup>General Motors

### 11:20 AM Invited

**From Hot to Warm Forming of Light Alloys: How Can We Predict Performance?:** *Eric Taleff*<sup>1</sup>; <sup>1</sup>The University of Texas at Austin

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## Continuous Improvement of Academic Programs (and Satisfying ABET Along the Way): The Elizabeth Judson Memorial Symposium: Best Practice in Program Improvement

*Program Organizer:* Jeffrey Fergus, Auburn University

Tuesday AM                      Room: E160A  
October 18, 2011              Location: Columbus Con. Center

*Session Chairs:* William Hammetter, Sandia National Laboratory; Ronald Gibala, University of Michigan

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### 8:00 AM Invited

**Avoiding Pitfalls Regarding Criteria 2 and 3 in an ABET Visit:** *Thomas Bieler*<sup>1</sup>; <sup>1</sup>Michigan State University

### 8:40 AM

**Continuous Improvement as an Integral Part of a Department's Work:** *Amy Moll*<sup>1</sup>; <sup>1</sup>Boise State University

**9:00 AM**

**Restructuring a Curriculum in the Spirit of Continuous Improvement:** R. Allen Kimel<sup>1</sup>; Gary L. Messing<sup>1</sup>; Christopher Muhlstein<sup>1</sup>; David J. Green<sup>1</sup>; Venkatraman Gopalan<sup>1</sup>; James Runt<sup>1</sup>; Zi-Kui Liu<sup>1</sup>; <sup>1</sup>Penn State University

**9:20 AM**

**Student Input about the Strength of Ceramic Curriculums at Universities Nationwide: Examining Educational Strengths and Weaknesses in Materials Science and Engineering:** Erica Marden<sup>1</sup>; <sup>1</sup>American Ceramic Society's President's Council of Student Advisors

**9:40 AM Break**

**10:00 AM**

**ABET: Good or Evil? Your Chance to Bite Back!** Steve Yalisove<sup>1</sup>; <sup>1</sup>University of Michigan

**10:40 AM Panel Discussion** Individuals involved in the accreditation process, including ABET staff and representatives from the materials community, will discuss current practices for program improvement in materials-related academic programs.

## Controlled Synthesis, Processing and Applications of Structural and Functional Nanomaterials: One Dimensional Nanomaterials I

**Program Organizers:** Kathy Lu, Virginia Tech; Xudong Wang, University of Wisconsin - Madison; Eugene Olevsky, San Diego State University; Gurpreet Singh, Kansas State University; Nitin Chopra, The University of Alabama; Pu-Xian Gao, University of Connecticut; Jianyu Liang, Worcester Polytechnic Institute

Tuesday AM  
October 18, 2011

Room: C123  
Location: Columbus Con. Center

**Session Chair:** Gurpreet Singh, Kansas State University

**8:00 AM Invited**

**One-Dimensional ZnO Nanostructures for Photonic and Optoelectronic Applications:** Min Gao<sup>1</sup>; <sup>1</sup>Peking University/Kent State University

**8:40 AM**

**One-Dimensional Nanostructures of Transition Metal Oxides with Large Aspect Ratios:** Haitao Zhang<sup>1</sup>; Padmanabha Chavvakula<sup>1</sup>; <sup>1</sup>UNC Charlotte

**9:00 AM**

**Low Temperature Synthesis of Boron Carbide Nanowires with Multiple Twinning:** Zhe Guan<sup>1</sup>; Timothy Gutu<sup>1</sup>; Terry Xu<sup>1</sup>; <sup>1</sup>University of North Carolina at Charlotte

**9:20 AM**

**Experimental and Theoretical Analysis of Spark-Plasma Sintering Mechanisms:** Eugene Olevsky<sup>1</sup>; William Bradbury<sup>1</sup>; Wei Li<sup>1</sup>; Cristina Garcia<sup>1</sup>; Randall German<sup>1</sup>; <sup>1</sup>San Diego State University

**9:40 AM Break**

**10:00 AM Invited**

**Carbon Nanotube Coatings Laser Power and Energy Measurements:** John Lehman<sup>1</sup>; <sup>1</sup>National Institute of Standards and Technology

**10:40 AM Invited**

**Development of Nanostructured Composite Electrodes for All Solid-State Lithium Ion Batteries:** Conrad Stoldt<sup>1</sup>; SeHee Lee<sup>1</sup>; James Trevey<sup>1</sup>; Hector MacPherson<sup>1</sup>; Brian Francisco<sup>1</sup>; <sup>1</sup>University of Colorado

**11:20 AM**

**Functional Metal Oxide Nanowires and Nano-Heterostructures:** Sanjay Mathur<sup>1</sup>; Hao Shen<sup>1</sup>; Thomas Fischer<sup>1</sup>; Robin Hagen<sup>1</sup>; Ralf Müller<sup>1</sup>; Jun Pan<sup>1</sup>; <sup>1</sup>University of Cologne

**11:40 AM**

**Synthesis and Spectroscopic Characterization of Si(B)CN Composite Nanowires:** Romil Bhandavat<sup>1</sup>; Gurpreet Singh<sup>1</sup>; <sup>1</sup>Kansas State University

## Deformation and Transitions at Grain Boundaries: Deformation Twins and Dislocations Interactions with Grain Boundaries

**Program Organizers:** Thomas Bieler, Michigan State University; Douglas Spearot, University of Arkansas; Rozaliya Barabash, Oak Ridge National Laboratory; Shen Dillon, University of Illinois at Urbana-Champaign; Jian Luo, Clemson University

Tuesday AM  
October 18, 2011

Room: C121  
Location: Columbus Con. Center

**Session Chairs:** Haitham El Kadiri, Mississippi State University; Jian Wang, Los Alamos National Laboratory

**8:00 AM Invited**

**Effect of Applied Stresses on Thermodynamics of Grain Boundaries:** T. Frolov<sup>1</sup>; Y. Mishin<sup>1</sup>; <sup>1</sup>George Mason University

**8:20 AM**

**Neighbor Grain and Grain Boundary Effects on Deformation Twinning:** Rodney McCabe<sup>1</sup>; Stephen Niezgoda<sup>1</sup>; Carlos Tome<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

**8:40 AM**

**Slip Transfer across the a/b Interface in Equiaxed Ti-5Al-2.5Sn:** James Seal<sup>1</sup>; Martin Crimp<sup>1</sup>; Thomas Bieler<sup>1</sup>; Carl Boehlert<sup>1</sup>; <sup>1</sup>Michigan State University

**9:00 AM Invited**

**Deformation Twinning Mechanisms in FCC and HCP Metals:** Jian Wang<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

**9:20 AM**

**Accumulation of the Geometrically Necessary Dislocations in Bicrystals of Magnesium Alloys with LPSO Structure:** Tsuyoshi Mayama<sup>1</sup>; Tetsuya Ohashi<sup>2</sup>; <sup>1</sup>Kumamoto university; <sup>2</sup>Kitami Institute of Technology

**9:40 AM Break**

**10:00 AM**

**Interfaces in Size-Dependent Crystal Plasticity:** Sinisa Mesarovic<sup>1</sup>; Raghuraman Baskaran<sup>1</sup>; <sup>1</sup>Washington State University

**10:20 AM Invited**

**Interactions of Dislocations and Twin Boundaries in Titanium with First-Principles:** Dallas Trinkle<sup>1</sup>; Maryam Ghazisaeidi<sup>1</sup>; <sup>1</sup>University of Illinois, Urbana-Champaign

**10:40 AM**

**The Effect of Twin Spacing and Grain Size on the Plastic Deformation of Nanocrystalline Copper:** Arina Marchenko<sup>1</sup>; Hao Zhang<sup>1</sup>; <sup>1</sup>University of Alberta

**11:00 AM Invited**

**Microstructure Evolution during Simple Shear Deformation and Dislocation Patterning Induced by Special Grain Boundaries:** Pascal Bellon<sup>1</sup>; Wenjun Cai<sup>2</sup>; Fuzeng Ren<sup>1</sup>; Armand Beaudoin<sup>1</sup>; Mohsen Pouryazdan<sup>3</sup>; Horst Hahn<sup>3</sup>; <sup>1</sup>University of Illinois; <sup>2</sup>MIT; <sup>3</sup>Karlsruhe Institute of Technology

**11:20 AM Invited**

**In Situ Spatially Resolved Strain Measurements within a Twinned Grain during Loading of Magnesium:** Donald Brown<sup>1</sup>; Levente Balogh<sup>1</sup>; Stephen Niezgoda<sup>1</sup>; Bjorn Clausen<sup>1</sup>; Carlos Tome<sup>1</sup>; Wenjun Liu<sup>1</sup>; <sup>1</sup>Los Alamos National Lab



11:40 AM Invited

**Twin nucleation, Twin Propagation, Twin-Slip Interactions, Pseudo-Elasticity, Strain-Rate Sensitivity and Non-Schmid's Effects of {10-1 2} Twinning in Magnesium via In-Situ EBSD:** *Haitham El Kadiri*<sup>1</sup>;

<sup>1</sup>Mississippi State University

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## Emerging Frontiers in Surface Engineering of Biomaterials : Biocoatings and Surface Engineering

*Program Organizers:* Kantesh Balani, Indian Institute of Technology Kanpur; Arvind Agarwal, Florida International University; Sandip Harimkar, Oklahoma State University; Winston Soboyejo, Princeton University

Tuesday AM  
October 18, 2011

Room: C226  
Location: Columbus Con. Center

*Session Chairs:* Sandip Harimkar, Oklahoma State University; Kantesh Balani, Indian Institute of Technology Kanpur

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8:00 AM

**Surface Engineering of Biomaterials by Colossal Supersaturation with Interstitial Solutes:** *Frank Ernst*<sup>1</sup>; Gary Michal<sup>1</sup>; Arthur Heuer<sup>1</sup>; <sup>1</sup>CWRU

8:20 AM

**In-Vivo Modification of Elastic Modulus Gradient at Implant-Bone Interface:** *Debrupa Lahiri*<sup>1</sup>; Sybille Facca<sup>2</sup>; Nadia Benkirane-Jessel<sup>2</sup>; Arvind Agarwal<sup>1</sup>; <sup>1</sup>Florida International University; <sup>2</sup>Institut National de la Santé et de la Recherche Médicale (INSERM), Unité 977

8:40 AM

**Laser Deposited Coatings of CoCrMo-Alloy Onto Ti-6Al-4V and SS316 Substrates for Biomedical Application:** Nolan Jones<sup>1</sup>; Jin Li<sup>1</sup>; *Yung Shin*<sup>1</sup>; <sup>1</sup>Purdue University

9:00 AM

**Electrochemical Deposition of Strontium-Doped Hydroxyapatite Coatings:** *Ling Li*<sup>1</sup>; Christopher Weyant<sup>1</sup>; <sup>1</sup>Stony Brook University

9:20 AM

**Synthesis of ZnO Coatings on Titanium by High-Energy Ball Milling:** Monica Mohan<sup>1</sup>; Anantha Subramanian<sup>1</sup>; Ramaswamy Narayanan<sup>1</sup>; *Peter Angelo*<sup>1</sup>; <sup>1</sup>PSG College of Technology

9:40 AM Break

10:00 AM

**The Influence of Topographic Features Produced by Laser Micromachining and Surface Diffusion Techniques on Bone Cell Behavior:** *Jorge Sobral*<sup>1</sup>; William O'Neill<sup>2</sup>; Trevor Clyne<sup>1</sup>; <sup>1</sup>University of Cambridge, Department of Materials Science and Metallurgy; <sup>2</sup>University of Cambridge, Department of Engineering

10:20 AM

**The New and Advanced Coatings for Bio-Compatible Implant Alloys Which Can Be Used in Dentistry Human Body:** Amir Masoud Soleimanpour<sup>1</sup>; *Solmaz Soleimanpour*<sup>2</sup>; <sup>1</sup>Sharif University Of Technology; <sup>2</sup>Tehran Azad University

10:40 AM

**Vascular Wall Engineering via Femtosecond Laser Processing:** *Carol Lee*<sup>1</sup>; Yong Lim<sup>1</sup>; David Farson<sup>1</sup>; Heather Powell<sup>1</sup>; John Lannutti<sup>1</sup>; <sup>1</sup>The Ohio State University

11:00 AM

**Processing and Evaluation of Durable Corrosion Inhibiting Polyimide-Silicone Coatings:** *Jimmy Longun*<sup>1</sup>; Jude Iroh<sup>1</sup>; <sup>1</sup>University of Cincinnati

11:20 AM Concluding Comments

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## Energy Conversion/Fuel Cells: Heterogeneous Functional Materials for Energy Systems

*Program Organizers:* Matthew Seabaugh, NexTech Materials, Ltd.; Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Meilin Liu, Georgia Institute of Technology

Tuesday AM  
October 18, 2011

Room: C224  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

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8:00 AM

**HeteroFoaM: New Concepts and Tools for Heterogeneous Functional Material Design in SOFCs:** *Ken Reifsnider*<sup>1</sup>; Fazle Rabbi<sup>1</sup>; Rassel Raihan<sup>1</sup>; Prasun Majumdar<sup>1</sup>; <sup>1</sup>University of South Carolina

8:40 AM

**A Hybrid Unit Based on Solid Oxide Fuel Cells for Electricity and Fuel-Assisted Hydrogen Generation:** *Anil Virkar*<sup>1</sup>; Greg Tao<sup>2</sup>; <sup>1</sup>University of Utah; <sup>2</sup>Materials and Systems Research, Inc.

9:20 AM

**Understanding the Surface of Heterogeneous Porous Electrodes: Modeling, Simulation, and In Situ Characterization**  
: *Meilin Liu*<sup>1</sup>; <sup>1</sup>Georgia Institute of Technology

9:40 AM Break

10:00 AM

**Novel SOFC Processing Techniques Employing Printed Materials:** *Denis Cormier*<sup>1</sup>; <sup>1</sup>Rochester Institute of Technology

10:40 AM

**A Novel Electrode Material for Symmetrical Solid Oxide Fuel Cells:** Qiang Liu<sup>1</sup>; Guoliang Xiao<sup>1</sup>; Daniel Bugaris<sup>1</sup>; Hans-Conrad zur Loye<sup>1</sup>; *Fanglin (Frank) Chen*<sup>1</sup>; <sup>1</sup>University of South Carolina

11:20 AM

**Quantum Mechanics Evaluation of Solid Oxide Fuel Cell Cathode Materials:** *Emily Carter*<sup>1</sup>; <sup>1</sup>Princeton University

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## Energy Storage: Materials, Systems and Applications: Energy Storage for Transportation Applications II

*Program Organizers:* Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Terry Holesinger, Los Alamos National Laboratory; Xingbo Liu, West Virginia University; Chun Lu, Siemens Energy, Inc.

Tuesday AM  
October 18, 2011

Room: C223  
Location: Columbus Con. Center

*Session Chairs:* Christopher Johnson, National Energy Technology Lab; Jian Luo, Clemson University

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8:00 AM

**Ultrathin Alumina Coated Carbon Nanotubes as Anodes for High Capacity Li-Ion Battery:** *Indranil Lahiri*<sup>1</sup>; Wonbong Choi<sup>1</sup>; <sup>1</sup>Florida International University

8:20 AM

**Properties of Self-Assembled Polymer Derived C/SiCN Nanocomposites as the Anode in Lithium Ion Batteries:** *cheng li*<sup>1</sup>; Linan An<sup>1</sup>; <sup>1</sup>university of central florida

Tuesday AM

8:40 AM

**Binder-Free LiFePO<sub>4</sub> Coated with Nanocarbon Cathodes for Efficient Lithium-Ion Intercalation:** *Nan Zhou*<sup>1</sup>; Jiangang Li<sup>1</sup>; Yanyi Liu<sup>1</sup>; Guozhong Cao<sup>1</sup>; <sup>1</sup>University of Washington

9:00 AM

**Design and Control of Nanostructures and Crystallinity of LiFePO<sub>4</sub> for Excellent Lithium-Ion Intercalation:** *Yanyi Liu*<sup>1</sup>; Guozhong Cao<sup>1</sup>; <sup>1</sup>University of Washington

9:20 AM

**Design of LiFePO<sub>4</sub>/Carbon Hybrid Structure for Improving Electrochemical Performance as Li-Battery Cathode Materials:** *Yuki Matsuda*<sup>1</sup>; Masahiko Miyahara<sup>1</sup>; Hirokazu Sasaki<sup>1</sup>; Atsushi Nemoto<sup>1</sup>; Maki Moriya<sup>1</sup>; Hiroshi Okamura<sup>1</sup>; Shingo Katayama<sup>1</sup>; Yuji Akimoto<sup>1</sup>; Shin-ich Hirano<sup>2</sup>; <sup>1</sup>SHOEI CHEMICAL INC.; <sup>2</sup>National Institution for Academic Degrees and University Evaluation

9:40 AM Break

10:00 AM Invited

**Utilizing Nanoscale Interfacial Films to Tailor Battery and Other Ionic Materials:** *Jian Luo*<sup>1</sup>; Archana Kayyar<sup>1</sup>; Haijun Qian<sup>1</sup>; Jiajia Huang<sup>1</sup>; <sup>1</sup>Clemson University

10:40 AM

**Reliability Considerations for Second Life Applications for Used EV Batteries:** *Davion Hill*<sup>1</sup>; Arun Agarwal<sup>2</sup>; Francois Ayello<sup>2</sup>; <sup>1</sup>Det Norske Veritas; <sup>2</sup>Det Norske Veritas

11:00 AM

**Smoothed Boundary Simulation of Electrochemical Processes in Complex Cathode Microstructure in Li-Ion Batteries:** *Hui-Chia Yu*<sup>1</sup>; Bernardo Orvananos<sup>1</sup>; Scott Cronin<sup>2</sup>; Scott Barnett<sup>2</sup>; Katsuyo Thornton<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>Northwestern University

11:20 AM

**Electronic Conductivity Enhancement of CNT Dispersed LiMnPO<sub>4</sub> as a Cathode Electrode for Lithium Rechargeable Battery:** *Chek Hai Lim*<sup>1</sup>; Hyun-Wook Lee<sup>1</sup>; San Moon<sup>1</sup>; Dong Jun Kim<sup>1</sup>; Do Kyung Kim<sup>1</sup>; <sup>1</sup>KAIST

11:40 AM Cancelled

**Effect of Lithium Phosphate Coating on Lithium Iron Orthosilicate for Cathode Applications in Li-Ion Batteries:** *Archana Kayyar*<sup>1</sup>; <sup>1</sup>Clemson University

## Environmentally Assisted Cracking of Materials: Session II

**Program Organizers:** Ramgopal Thodla, DNV Columbus; Suresh Divi, TIMET

Tuesday AM  
October 18, 2011

Room: D233  
Location: Columbus Con. Center

**Session Chair:** Ramgopal Thodla, DNV Columbus

### 8:00 AM Introductory Comments

8:20 AM

**A Study on the Stress Corrosion Cracking Mechanism of Carbon Steel in Fuel Grade Ethanol:** *Feng Gui*<sup>1</sup>; Narasi Sridhar<sup>1</sup>; John Beavers<sup>1</sup>; <sup>1</sup>DNV

8:40 AM

**An Environmentally Assisted Cracking Investigation of Wrought Ni-Al and Si-Al Bronze in Seawater and Ammonia Solutions:** *Michelle Koul*<sup>1</sup>; Jennifer Gaies<sup>2</sup>; <sup>1</sup>USNA; <sup>2</sup>NSWC Carderock Division

9:00 AM

**Corrosion and Cracking of Carbon Steel in Fuel Grade Ethanol – Using Supporting Electrolyte to Study Cracking Mechanism:** *Liu Cao*<sup>1</sup>; Gerald Frankel<sup>1</sup>; Narasi Sridhar<sup>2</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>DNV Research & Innovation USA

9:20 AM

**Coupled Hydrogen Transport and Deformation of 21Cr-6Ni-9Mn Austenitic Stainless Steel:** *James Foulk*<sup>1</sup>; Brian Somerday<sup>1</sup>; Chris San Marchi<sup>1</sup>; Yuki Ohashi<sup>1</sup>; Dorian Balch<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

9:40 AM Break

10:00 AM

**Effect of Boron on the Microstructure and Hydrogen Resistance Performance in Fe-Ni Based Alloys:** *Zifeng Guo*<sup>1</sup>; Mingjiu Zhao<sup>1</sup>; Lijian Rong<sup>1</sup>; Yiyi Li<sup>1</sup>; <sup>1</sup>Institute of Metal Research, Chinese Academy of Sciences, China

10:20 AM

**Effects of a Low pH Environment on the Creep Behavior of AA1100:** *Quanhe Wan*<sup>1</sup>; David Quesnel<sup>1</sup>; <sup>1</sup>University of Rochester

10:40 AM

**Effects of Gaseous Hydrogen Exposure and Temperature on Fracture of Austenitic Stainless Steels:** *Heather Jackson*<sup>1</sup>; Brian Somerday<sup>1</sup>; Chris San Marchi<sup>1</sup>; Dorian Balch<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

11:00 AM

**Enhanced Corrosion Fatigue Resistance of SUS304 Bellows Expansion by Modifying the Bellows Shape:** *Takafumi Ono*<sup>1</sup>; Tomomi Fujikawa<sup>1</sup>; Hiroyuki Miyamoto<sup>1</sup>; Toshiyuki Uenoya<sup>1</sup>; Masatoshi Matsumura<sup>2</sup>; <sup>1</sup>Doshisha University; <sup>2</sup>Nippon Shinshyukukan Co., LTD.

11:20 AM

**Enhanced Lattice Defect Formation Associated with Hydrogen and Hydrogen Embrittlement under Elastic Stress of High-Strength Steel:** *Tomoki Doshida*<sup>1</sup>; Hiroshi Suzuki<sup>1</sup>; Yukito Hagihara<sup>1</sup>; Kenichi Takai<sup>1</sup>; <sup>1</sup>Sophia University

## Failure Analysis and Prevention: Welding, Joining and General Interest

**Program Organizers:** Andrew Spowage, The University of Nottingham, Malaysia Campus; Tom Ackerson, IMR Metallurgical Services; Larry Hanke, Materials Evaluation and Engineering, Inc

Tuesday AM  
October 18, 2011

Room: D235  
Location: Columbus Con. Center

**Session Chairs:** Paul Redmond, Southwest Research Institute; Dennis McGarry, SEA Limited; Lindsay Malloy, Riley Power, Inc.

8:00 AM

**Mechanical Properties and Microstructure Evolutions of Ultrafine-Grained Al during Recovery via Annealing:** *Yonghao Zhao*<sup>1</sup>; T.D. Topping<sup>1</sup>; J.F. Bingert<sup>2</sup>; Y. Li<sup>1</sup>; P.L. Sun<sup>3</sup>; E.J. Lavernia<sup>1</sup>; <sup>1</sup>University of California Davis; <sup>2</sup>Los Alamos National Laboratory; <sup>3</sup>Feng Chia University, Taiwan

8:20 AM

**Failure Investigation of an Automotive Component:** *Sudhakar Vadiraja*<sup>1</sup>; <sup>1</sup>Montana Tech

8:40 AM

**Assessing High Temperature Failures in Components under Constraint:** *Darren Barborak*<sup>1</sup>; George Lai<sup>1</sup>; Bingtao Li<sup>1</sup>; <sup>1</sup>Aquilex WSI

**9:00 AM**

**An Investigation on L605 Cracking during Wire Manufacturing:** Song Cai<sup>1</sup>; Larry Kay<sup>1</sup>; <sup>1</sup>Fort Wayne Metals Research Products Corp.

**9:20 AM**

**SEM/EDS Microstructural and Spectroscopic Analysis of Ethylene Furnace Steel Alloy Tubes:** Cleophas Loto<sup>1</sup>; <sup>1</sup>Tshwane University of Technology

**9:40 AM Break****10:00 AM**

**Failure Analysis of Duplex Stainless Steel Wet Flue Gas Desulfurization Absorber Vessels:** Brett Tossey<sup>1</sup>; <sup>1</sup>DNV USA, Inc.

**10:20 AM**

**A Case Study of Four Fractured Tack-Welded Tied-Rods Supporting an Expansion Joint Bellows:** Paul Redmond<sup>1</sup>; Daniel Hopkins<sup>1</sup>; <sup>1</sup>Southwest Research Institute

**10:40 AM**

**Thickness Effects on the Quantification of Thin Film Cohesive and Adhesive Failure Mechanisms during Nano Scratch Testing:** Bo Zhou<sup>1</sup>; Nicholas Randall<sup>1</sup>; Barton Prorok<sup>2</sup>; <sup>1</sup>CSM Instruments; <sup>2</sup>Auburn University

**11:00 AM**

**An Accident Resulting from a False Lock Configuration on a Rear Fly Extension Ladder:** Alan Johnson<sup>1</sup>; Randall Storey<sup>2</sup>; <sup>1</sup>Metals Research Inc.; <sup>2</sup>University of Louisville

**11:20 AM**

**Ford Probe Seat Collapse:** Richard McSwain<sup>1</sup>; Eric Van Iderstine<sup>1</sup>; William Carden<sup>1</sup>; Mark Hood<sup>1</sup>; <sup>1</sup>McSwain Engineering, Inc.

**11:40 AM**

**Need to Sweat the Small Stuff:** Wayne Reitz<sup>1</sup>; <sup>1</sup>Reitz Consulting, Ltd.

## Fatigue and Microstructure: A Symposium on Recent Advances: Crack Initiation

*Program Organizers:* Amit Shyam, Oak Ridge National Laboratory; Sushant Jha, Air Force Research Laboratory/Universal Technology Corporation; Michael Caton, US Air Force Research Laboratory

Tuesday AM  
October 18, 2011

Room: D240/241  
Location: Columbus Con. Center

*Session Chairs:* Michael Sangid, University of Illinois at Urbana-Champaign; Luc Remy, Mines ParisTech

**8:00 AM**

**Mitigation of Fatigue Crack Initiation and Growth by Microstructure-Induced Residual Stresses:** Kwai Chan<sup>1</sup>; <sup>1</sup>Southwest Research Institute

**8:40 AM**

**A Physically-Based Fatigue Model for Prediction of Crack Initiation from Persistent Slip Bands in Polycrystals:** Michael Sangid<sup>1</sup>; Huseyin Sehitoglu<sup>1</sup>; <sup>1</sup>University of Illinois, Urbana-Champaign

**9:00 AM**

**Quantitative Evaluation of Fatigue Life of Aluminium Alloys by Non-Destructive Testing and Parameter Model:** Yakub Tijani<sup>1</sup>; Andre Heinrietz<sup>2</sup>; Thomas Bruder<sup>2</sup>; Holger Hanselka<sup>1</sup>; <sup>1</sup>Technical University Darmstadt; <sup>2</sup>Fraunhofer Institute for Structural Durability and System Reliability, LBF

**9:20 AM**

**Fatigue and Corrosion Properties of Mg-Al-Mn Alloy by Super Vacuum Die Cast:** Wei Wen<sup>1</sup>; Alan A. Luo<sup>2</sup>; Tongguang Zhai<sup>1</sup>; <sup>1</sup>University of Kentucky; <sup>2</sup>General Motors Corporation

**9:40 AM Break****10:00 AM**

**An Atomistic Energy-Based Model for Fatigue Accounting for Grain Boundary Characters:** Huseyin Sehitoglu<sup>1</sup>; Michael Sangid<sup>1</sup>; Hans Maier<sup>2</sup>; <sup>1</sup>University of Illinois; <sup>2</sup>University of Paderborn, Germany

**10:40 AM**

**Strip-Yield Modeling of Creep-Fatigue Crack Nucleation and Growth in Heat-Resistant Steels:** Gabriel Potirniche<sup>1</sup>; <sup>1</sup>University of Idaho

**11:00 AM**

**Four-Point Fatigue of High Strength Low Carbon Bainitic Steel:** Linghui Du<sup>1</sup>; Xiucheng Li<sup>1</sup>; Wei Wen<sup>1</sup>; Chengjia Shang<sup>1</sup>; Tongguang Zhai<sup>1</sup>; <sup>1</sup>University of Science and Technology Beijing

**11:20 AM**

**Factors Controlling Fatigue Crack Initiation at Particles in High Strength Al Alloys:** Xinliang Zang<sup>1</sup>; Wei Wen<sup>2</sup>; Alfonso Ngan<sup>3</sup>; Tongguang Zhai<sup>2</sup>; <sup>1</sup>Yanshan University; <sup>2</sup>University of Kentucky; <sup>3</sup>University of Hong Kong

**11:40 AM**

**Cryogenic S-N Fatigue Behavior of Cast 304 and 316 Stainless Steels:** Jaeki Kwon<sup>1</sup>; Kyungjin Cha<sup>2</sup>; Youngju Kim<sup>1</sup>; Sokeul Chung<sup>1</sup>; Sangshik Kim<sup>2</sup>; <sup>1</sup>Korea Institute of Geoscience & Mineral Resources(KIGAM); <sup>2</sup>Gyeongsang National University/Department of Metallurgical and Materials Engineering

## Glass and Optical Materials: Optical Materials I

*Program Organizer:* Pierre Lucas, University of Arizona

Tuesday AM  
October 18, 2011

Room: C111  
Location: Columbus Con. Center

*Session Chair:* Armani Andrea, University of Southern California

**8:00 AM**

**Glass-Clad Semiconductor Core Optical Fibers:** John Ballato<sup>1</sup>; Stephanie Morris<sup>1</sup>; Wade Hawkins<sup>1</sup>; Paul Foy<sup>1</sup>; Colin McMillen<sup>1</sup>; Roger Stolen<sup>1</sup>; Steve Martin<sup>2</sup>; Robert Rice<sup>3</sup>; <sup>1</sup>Clemson University; <sup>2</sup>Iowa State University; <sup>3</sup>Northrop Grumman Space Technology

**8:40 AM**

**Solidification of Silicon Optical Fibers:** Brian Scott<sup>1</sup>; Gary Pickrell<sup>1</sup>; <sup>1</sup>Virginia Tech

**9:00 AM**

**Characterizations of a Hot-Pressed Polycrystalline Spinel:Ce Scintillator:** Ching-Fong Chen<sup>1</sup>; F. Doty<sup>2</sup>; R. Houk<sup>2</sup>; P. Yang<sup>2</sup>; H. Volz<sup>1</sup>; R. Loutfy<sup>3</sup>; <sup>1</sup>LANL; <sup>2</sup>SNLs; <sup>3</sup>MER Corporation

**9:20 AM**

**Development and Characterization of Polymer Nanocomposites with High-UV Shielding Efficiency:** Mulayam Gaur<sup>1</sup>; Pramod Singh<sup>1</sup>; <sup>1</sup>Hindustan College of Science and Technology

**9:40 AM Break**

## Glass and Optical Materials: Optical Materials II

Program Organizer: Pierre Lucas, University of Arizona

Tuesday AM  
October 18, 2011

Room: C111  
Location: Columbus Con. Center

Session Chair: John Ballato, Clemson University

### 10:00 AM

**Tailoring Glasses for Lasers and Optical Biosensors:** *Andrea Armani*<sup>1</sup>; Heather Hunt<sup>1</sup>; Brian Rose<sup>1</sup>; Simin Mehrabani<sup>1</sup>; Ashley Maker<sup>1</sup>; Kelvin Kuo<sup>1</sup>; Rasheeda Hawk<sup>1</sup>; <sup>1</sup>University of Southern California

### 10:40 AM

**Association of Defects with Antimony Luminescence Centers in Calcium Fluorapatite Phosphors:** *Eric Kreidler*<sup>1</sup>; <sup>1</sup>American Ceramic Society

### 11:00 AM

**Chalcogenide Glasses and Glass-Ceramics for Novel Infrared Technologies:** *Jean-Luc Adam*<sup>1</sup>; Xiang-Hua Zhang<sup>1</sup>; Johann Trolès<sup>1</sup>; Laurent Brilland<sup>2</sup>; Virginie Nazabal<sup>1</sup>; <sup>1</sup>Université de Rennes 1 - CNRS; <sup>2</sup>PERFOS

### 11:40 AM Cancelled

**Optical Properties of Samarium-Doped Oxyfluoride Glasses Containing CaF<sub>2</sub> Nanocrystallites:** *Marcel Dyrba*<sup>1</sup>; Paul-Tiberiu Miclea<sup>2</sup>; Mihail Secu<sup>3</sup>; Jacqueline Johnson<sup>4</sup>; Stefan Schweizer<sup>1</sup>; <sup>1</sup>Martin Luther University of Halle-Wittenberg; <sup>2</sup>Fraunhofer Center for Silicon Photovoltaics; <sup>3</sup>National Institute of Materials Physics; <sup>4</sup>University of Tennessee

## Green Technologies for Materials Manufacturing and Processing III: Green Materials Processing I

Program Organizers: Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST); Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center; Richard Sisson, Worcester Polytechnic Institute, Center for Heat Treating Excellence; Makio Naito, Osaka University

Tuesday AM  
October 18, 2011

Room: D232  
Location: Columbus Con. Center

Session Chairs: Morgana Fall, Ceralink Inc; Soshu Kirihaara, Osaka University

### 8:00 AM Invited

**Manufacturing Impact: Energy Reduction through Microwave Assist Technology Calcining of Limestone:** *Morgana Fall*<sup>1</sup>; Shawn Allan<sup>1</sup>; Holly Shulman<sup>1</sup>; <sup>1</sup>Ceralink Inc

### 8:40 AM

**Energy Efficient Sintered Reaction-Bonding Process of Silicon Nitride Ceramics:** Hideki Hyuga<sup>1</sup>; You Zhou<sup>1</sup>; Hideki Kita<sup>1</sup>; Kiyoshi Hirao<sup>1</sup>; *Tatsuki Ohji*<sup>1</sup>; <sup>1</sup>National Institute of Advanced Industrial Science and Technology (AIST)

### 9:00 AM

**Enhanced Mechanical Property of Hot-Pressed RBSN Ceramics with Lu<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub>/La<sub>2</sub>O<sub>3</sub>-MgO additives:** *Jae-Woong Ko*<sup>1</sup>; Sea-Hoon Lee<sup>1</sup>; Hai-Doo Kim<sup>1</sup>; <sup>1</sup>Korea Institute of Materials Science

### 9:20 AM

**Fabrication of Advanced Ceramics Using Nanocomposite Particles Prepared by A Dry Mechanical Treatment:** *Junichi Tatami*<sup>1</sup>; Hiromi Nakano<sup>2</sup>; Toru Wakihara<sup>1</sup>; Katsutoshi Komeya<sup>1</sup>; <sup>1</sup>Yokohama National University; <sup>2</sup>Toyohashi University of Technology

### 9:40 AM Break

### 10:00 AM Invited

**Particle Motion Directly Observed under Shear Stress Field in Plastic Ceramic Paste:** *Keizo Uematsu*<sup>1</sup>; Yuki takahashi<sup>1</sup>; Satoshi Tanaka<sup>1</sup>; <sup>1</sup>Nagaoka University of Technology

### 10:20 AM

**Novomer's Green Binders Reduce Energy Content of Advanced Ceramics:** *Jason Anderson*<sup>1</sup>; <sup>1</sup>Novomer, Inc.

### 10:40 AM

**Effects of Magnetic Flux Density on Structure of Green and Sintered Bodies in SrxBa1-xNb2O6 System Prepared in a Magnetic Field:** *Takuma Takahashi*<sup>1</sup>; Satoshi TANAKA<sup>1</sup>; Keizo UEMATSU<sup>1</sup>; <sup>1</sup>Nagaoka University of Technology

### 11:00 AM

**Drying-Induced Forming Coupled with Vibration for Fabrication of Ceramics with Reduced Defects:** *Sho Masuda*<sup>1</sup>; Satoshi Tanaka<sup>1</sup>; Keizo Uematsu<sup>1</sup>; <sup>1</sup>Nagaoka University of Technology

### 11:20 AM

**Production of Apatites and Calcium Phosphate from Fish By-Products:** *Clara Piccirillo*<sup>1</sup>; Isabel Braga da Cruz<sup>2</sup>; Rubens Jorge<sup>2</sup>; Robert Pullar<sup>3</sup>; Maria Manuela Pintado<sup>1</sup>; Paula Castro<sup>1</sup>; <sup>1</sup>Escola Superior Biotecnologia; <sup>2</sup>WeDoTech; <sup>3</sup>CICECO, Universidade de Aveiro

### 11:40 AM

**Study on the Corrosion Mechanism of Refinery Slag to MgO-CaO Refractories:** *YU Yanwen*<sup>1</sup>; <sup>1</sup>BAOSHAN IRON & STEEL CO.LTD. CHINA

## Hardness across the Multi-Scales of Structure and Loading Rate: Structural Aspects I

Program Organizers: Ronald Armstrong, University of Maryland; David Bahr, Washington State University; Naresh Thadhani, Georgia Institute of Technology; Stephen Walley, Physics and Chemistry of Solids Cavendish Laboratory

Tuesday AM  
October 18, 2011

Room: C210  
Location: Columbus Con. Center

Session Chairs: David Bahr, Washington State University; William Gerberich, University of Minnesota

### 8:00 AM Invited

**Exploiting Interactions between Indentation Size and Structure Size Effects: Theory, Experiment and Some Practical Implications:** *Xiaodong Hou*<sup>1</sup>; Nigel Jennett<sup>1</sup>; <sup>1</sup>National Physical Lab, UK

### 8:20 AM Invited

**On the Origin of High Hardness in Iron Alloys:** *Donald Lesuer*<sup>1</sup>; Chol Syn<sup>1</sup>; Oleg Sherby<sup>2</sup>; Jeffrey Wadsworth<sup>3</sup>; <sup>1</sup>Lawrence Livermore National Laboratory; <sup>2</sup>Stanford University; <sup>3</sup>Battelle

### 8:40 AM Invited

**Probing the Plastic Deformation Mechanisms of Ultrafine Grained and Nanocrystalline Metals Using Instrumented Indentation:** *Qiuming Wei*<sup>1</sup>; <sup>1</sup>University of North Carolina at Charlotte

### 9:00 AM Invited

**Size-Dependence of Rate Controlling Deformation Mechanism in Nanotwinned Copper:** *Lei Lu*<sup>1</sup>; <sup>1</sup>Institute of Metal Research, CAS

### 9:20 AM

**Effects of Differently Oriented Twin Boundaries on Mechanical Properties in Nanotwinned Ag Films:** *Daniel Bufford*<sup>1</sup>; Haiyan Wang<sup>1</sup>; Xinghang Zhang<sup>1</sup>; <sup>1</sup>Texas A&M University



#### 9:40 AM Break

##### 10:00 AM Invited

**Microhardness and Nanohardness Characterization of Advanced Multiphase Steels:** *Xiaoxu Huang*<sup>1</sup>; Masafumi Azuma<sup>1</sup>; Xiaodan Zhang<sup>1</sup>; Grethe Winther<sup>1</sup>; Niels Hansen<sup>1</sup>; <sup>1</sup>Risø National Laboratory for Sustainable Energy, Technical University of Denmark

##### 10:20 AM Invited

**Understanding and Controlling Nanostructure Formation and Development in Nano Steels:** *Daniel Branagan*<sup>1</sup>; Alla Sergueeva<sup>1</sup>; Jason Walliser<sup>1</sup>; Brian Meacham<sup>1</sup>; <sup>1</sup>The Nanosteel Co

##### 10:40 AM Invited

**Effect of Solute Atoms on Nanoindentation Behavior in Fine-Grained Magnesium Alloys:** *Hidetoshi Somekawa*<sup>1</sup>; *Christopher Schuh*<sup>1</sup>; <sup>1</sup>MIT

##### 11:00 AM Invited

**Capturing the Hardness of Nanomaterials through Gradient Plasticity:** *Katerina Aifantis*<sup>1</sup>; <sup>1</sup>Aristotle University

##### 11:20 AM

**Spherical Nanoindentation and Kinking Non-Linear Elasticity of LiTaO<sub>3</sub> Single Crystals:** *Babak Anasori*<sup>1</sup>; Kurt Sickafus<sup>2</sup>; Igor Usov<sup>2</sup>; Michel Barsoum<sup>1</sup>; <sup>1</sup>Drexel University; <sup>2</sup>Los Alamos National Laboratory

##### 11:40 AM

**Spherical Nanoindentation Stress-Strain Curves, Kinking Nonlinear Elastic Solids and Low Dimensionality Solids:** *Michel Barsoum*<sup>1</sup>; <sup>1</sup>Drexel University

### Innovative Processing and Synthesis of Ceramics, Glasses and Composites: Novel Synthesis and Processing

*Program Organizers:* J. P. Singh, U.S. Army Research Laboratory; Narottam Bansal, NASA Glenn Research Center; Takashi Goto, Tohoku University

Tuesday AM  
October 18, 2011

Room: C110  
Location: Columbus Con. Center

*Session Chairs:* Michael Hoffmann, Karlsruhe Institute of Technology; Do Kyung Kim, Korea Advanced Institute of Science and Technology

##### 8:00 AM Invited

**Evaluation of Ice-Templated Structure Formation from Particle Suspensions by Unidirectional Freezing:** *Michael J. Hoffmann*<sup>1</sup>; Thomas Waschki<sup>1</sup>; Guenter Schell<sup>1</sup>; Rainer Oberacker<sup>1</sup>; <sup>1</sup>Karlsruhe Institute of Technology (KIT)

##### 8:40 AM

**Ice-Templated Porous Ceramic Structures with Unidirectionally Aligned Channels:** *Dong Seok Kim*<sup>1</sup>; Seung Jun Lee<sup>1</sup>; Young Hoon Seong<sup>1</sup>; Do Kyung Kim<sup>1</sup>; <sup>1</sup>Korea Advanced Institute of Science and Technology

##### 9:00 AM

**Fabrication of Porous Si-B-C-N Ceramics through a Template Free Method:** *Jianhua Zou*<sup>1</sup>; Linan An<sup>1</sup>; <sup>1</sup>University of Central Florida

##### 9:20 AM

**Preparation and Characterization of a Zirconia-Spinel Nanoceramic Composite Prepared by a Current-Activated Method:** *Mahmood Shirooyeh*<sup>1</sup>; Terence Langdon<sup>1</sup>; <sup>1</sup>University of Southern California

#### 9:40 AM Break

##### 10:00 AM

**SHS Die-Casting (SHS-DC) of Magnesium Metal Matrix Composites (MMCs):** *Ilguk Jo*<sup>1</sup>; Jacob Nuechterlein<sup>1</sup>; William Garrett<sup>1</sup>; Munitz Abraham<sup>1</sup>; Michael Kaufman<sup>1</sup>; John Moore<sup>1</sup>; Ken Young<sup>2</sup>; Chris Rice<sup>2</sup>; Makhlof Makhlof<sup>3</sup>; Diran Apelian<sup>3</sup>; Alex Monroe<sup>4</sup>; <sup>1</sup>Colorado School of Mines; <sup>2</sup>VForge Inc.; <sup>3</sup>Worcester Polytechnic Institute; <sup>4</sup>North American Die Casting Association

##### 10:20 AM

**Die Castable SHS Derived Aluminum-Titanium Carbide Metal Matrix Composites:** *William Garrett*<sup>1</sup>; Ilguk Jo<sup>1</sup>; Jacob Nuechterlein<sup>1</sup>; Michael Kaufman<sup>1</sup>; John Moore<sup>1</sup>; <sup>1</sup>Colorado School of Mines

##### 10:40 AM Invited

**Facile Synthesis and Electrochemical Characterization of Oxide Nanostructures for Energy Device Applications:** *Do Kyung Kim*<sup>1</sup>; <sup>1</sup>KAIST

##### 11:20 AM

**Low Temperature Synthesis of Carbon-Free Si<sub>3</sub>N<sub>4</sub>/SiC Nanopowders Using Silica Fume:** *Jyothi Suri*<sup>1</sup>; Leon Shaw<sup>1</sup>; <sup>1</sup>University of Connecticut

##### 11:40 AM

**Properties of shock-synthesized rocksalt-aluminium nitride:** *Kevin Keller*<sup>1</sup>; Thomas Schlothauer<sup>1</sup>; Marcus Schwarz<sup>1</sup>; Erica Brendler<sup>1</sup>; Kristin Galonska<sup>1</sup>; Gerhard Heide<sup>1</sup>; Edwin Kroke<sup>1</sup>; <sup>1</sup>TU Mining Academy Freiberg

### Integrated Computational Materials Engineering: Modeling and Simulation Applied to Metals Processing: Materials Modeling Fundamentals and Applications to Phase Transformation and Microstructure Evolution

*Program Organizer:* David Furrer, Pratt & Whitney

Tuesday AM  
October 18, 2011

Room: C213  
Location: Columbus Con. Center

*Session Chairs:* Awadh Pandey, Pratt & Whitney Rocketdyne; Will Marsden, Granta

##### 8:00 AM

**Commercial Alloy Phase Diagrams and Their Industrial Applications:** *Fan Zhang*<sup>1</sup>; Weisheng Cao<sup>1</sup>; Shuanglin Chen<sup>1</sup>; Chuan Zhang<sup>1</sup>; Y. Austin Chang<sup>2</sup>; <sup>1</sup>CompuTherm, LLC; <sup>2</sup>University of Wisconsin-Madison

##### 8:20 AM

**Diffusivity and Mobility Data: Building Blocks for ICME:** *Carelyn Campbell*<sup>1</sup>; <sup>1</sup>National Institute of Standards and Technology

##### 8:40 AM

**Modeling Diffusion in Binary and Multicomponent Alloys:** *John Morral*<sup>1</sup>; Fred Meisenkothen<sup>2</sup>; <sup>1</sup>Ohio State University; <sup>2</sup>UES/Air Force Materials Lab

##### 9:00 AM

**Simulation of Diffusion in Surface and Interface Reactions and Examples of Industrial Applications:** *Paul Mason*<sup>1</sup>; Anders Engstrom<sup>2</sup>; John Ågren<sup>3</sup>; Samuel Hallström<sup>2</sup>; Thermo-Calc Software Inc; <sup>2</sup>Thermo-Calc Software AB; <sup>3</sup>Royal Institute of Technology, Stockholm

##### 9:20 AM

**Modeling the Carbonitriding Process – Diffusional Interactions between Carbon and Nitrogen:** *Yuan Xu*<sup>1</sup>; *Liang He*<sup>1</sup>; Richard Sisson<sup>1</sup>; <sup>1</sup>Worcester Polytechnic Institute, Center for Heat Treating Excellence

## 9:40 AM Break

### 10:00 AM

**Computer Simulation of Induction Heating of Ferrous and Non-Ferrous Alloys Prior to Coating, Hot and Warm Forming:** *Valery Rudnev<sup>1</sup>*; <sup>1</sup>Inductoheat Inc.

### 10:20 AM

**Multi-Scale Modeling of Austenite-Ferrite Transformation in Steels:** *Matthias Militzer<sup>1</sup>*; Jeffrey Hoyt<sup>2</sup>; Nikolas Provatas<sup>2</sup>; Joerg Rottler<sup>1</sup>; Chad Sinclair<sup>1</sup>; Hatem Zurob<sup>2</sup>; <sup>1</sup>The University of British Columbia; <sup>2</sup>McMaster University

### 10:40 AM

**Phase Field Modelling of Recrystallization during Annealing of a Dual-Phase Steel:** *Benqiang Zhu<sup>1</sup>*; Matthias Militzer<sup>1</sup>; <sup>1</sup>University of British Columbia

### 11:00 AM

**Vertex-Model Simulations of Abnormal Grain Growth in Electrical Steels:** *Luis Barrales-Mora<sup>1</sup>*; Manuel Krott<sup>1</sup>; Günter Gottstein<sup>1</sup>; <sup>1</sup>Institut fuer Metallkunde und Metallphysik

### 11:20 AM

**Modeling the Volume Fraction and Size Distribution of  $\gamma'$  Precipitates in Waspaloy as a Function of Thermal Processing:** *Michael Chapman<sup>1</sup>*; G. B. Viswanathan<sup>2</sup>; Sara Knox<sup>1</sup>; Triplicane Parthasarathy<sup>2</sup>; Rollie Dutton<sup>3</sup>; Jay Tiley<sup>3</sup>; <sup>1</sup>Wright State University, Dayton OH 45435; <sup>2</sup>UES, Inc., Dayton, OH 45432; <sup>3</sup>Air Force Materials Research Laboratory, Wright Patterson AFB, OH 45433

### 11:40 AM Cancelled

**Effect of Solidification Velocity and Hydrogen Content on Pore Formation in A356 Alloy Based XIDS and X-Ray Detection:** *Hengcheng Liao<sup>1</sup>*; Qigui Wang<sup>2</sup>; Wan Song<sup>1</sup>; <sup>1</sup>Southeast University; <sup>2</sup>GM Powertrain

## Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches -- Fundamental and Engineering Issues: Interface Dynamics

**Program Organizers:** Wayne Kaplan, Technion - Israel Institute of Technology; Paul Wynblatt, Carnegie Mellon University; Dominique Chatain, Centre Interdisciplinaire de Nanoscience de Marseille; Mikel Holcomb, West Virginia University

Tuesday AM  
October 18, 2011

Room: C120  
Location: Columbus Con. Center

**Session Chairs:** Mark Asta, University of California, Berkeley; Gerhard Dehm, University of Leoben

### 8:00 AM Keynote

**Key Stages in Reactive Spreading:** *Eduardo Saiz<sup>1</sup>*; Antoni Tomsia<sup>2</sup>; <sup>1</sup>Imperial College; <sup>2</sup>Lawrence Berkeley National Laboratory

### 8:40 AM Invited

**The Ubiquitous Interfacial Free Energy in Phase Transformations:** *David Seidman<sup>1</sup>*; <sup>1</sup>Northwestern University

### 9:00 AM Invited

**In-Situ TEM Investigation of Interfacial Processes in Aqueous and Environmental Systems:** *Shen Dillon<sup>1</sup>*; <sup>1</sup>University of Illinois at Urbana-Champaign

### 9:20 AM Invited

**Silver Layer Instability in a SnO<sub>2</sub>/Silver/SnO<sub>2</sub> Trilayer on Silicon:** *Carol Handwerker<sup>1</sup>*; Suk Jun Kim<sup>1</sup>; Eric Stach<sup>1</sup>; <sup>1</sup>Purdue University

## 9:40 AM Break

### 10:00 AM Invited

**The Effect of NiO on Microstructure and Densification in Several Oxides:** *Ivar Reimanis<sup>1</sup>*; Joshua White<sup>1</sup>; Amy Morrissey<sup>1</sup>; Jianhua Tong<sup>1</sup>; James O'Brien<sup>2</sup>; <sup>1</sup>Colorado School of Mines; <sup>2</sup>Quantum Design

### 10:20 AM

**Effect of Layer Thickness on the Heterophase Interface Character Distribution (HICD) of Accumulative Roll-Bonded Cu-Nb Composites:** *Jonathan LeDonne<sup>1</sup>*; Sukbin Lee<sup>1</sup>; Samuel Lim<sup>2</sup>; Xuan Liu<sup>1</sup>; Amith Darbal<sup>1</sup>; Noel Nuhfer<sup>1</sup>; Nathan Mara<sup>3</sup>; Irene Beyerlein<sup>3</sup>; Katy Barmak<sup>1</sup>; Anthony Rollett<sup>1</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Singapore Institute of Manufacturing Technology; <sup>3</sup>Los Alamos National Laboratory

### 10:40 AM

**Abnormal Grain Growth and Grain Boundaries in Strontium and Barium Titanate:** *Michael Baeurer<sup>1</sup>*; Michael Hoffmann<sup>1</sup>; <sup>1</sup>Karlsruhe Institute of Technology

### 11:00 AM

**An Interface Field Model for Motion of Anisotropic Grain Boundaries:** *Debashis Kar<sup>1</sup>*; Seth Wilson<sup>1</sup>; Jason Gruber<sup>1</sup>; Gregory Rohrer<sup>1</sup>; Anthony Rollett<sup>1</sup>; <sup>1</sup>CARNEGIE MELLON U

### 11:20 AM

**Anisotropic Hole Growth during Solid-State Dewetting of Single Crystal Fe-Au Thin Films:** *Dor Amram<sup>1</sup>*; Leonid Klinger<sup>1</sup>; Eugen Rabkin<sup>1</sup>; Technion

### 11:40 AM

**Solid State Oxidation of Aluminum at the Aluminum-Sapphire Interface: Oxygen Transport Mechanism:** *Sreya Dutta<sup>1</sup>*; Helen Chan<sup>1</sup>; Richard Vinci<sup>1</sup>; <sup>1</sup>Lehigh University

## International Symposium on Advances in Nanostructured Materials and Applications: The 2011 Acta Materialia Gold Medal Symposium: Nanoceramics I: Oxides and Thin Film Interfaces

**Program Organizers:** Haiyan Wang, Texas A&M University; Nuggehalli Ravindra, New Jersey Institute of Technology; Alan Ardell, National Science Foundation; Yuntian Zhu, North Carolina State University; Xinghang Zhang, Texas A&M University; Rajiv K. Singh, University of Florida; John Prater, Army Research Office

Tuesday AM  
October 18, 2011

Room: E170  
Location: Columbus Con. Center

**Session Chairs:** Kevin Jones, University of Florida; Nuggehalli Ravindra, New Jersey Institute of Technology

### 8:00 AM Invited

**Atomic-Scale Characterization of Electronic and Optical Materials:** *Stephen Pennycook<sup>1</sup>*; Honghui Zhou<sup>2</sup>; Matthew Chisholm<sup>1</sup>; Wu Zhou<sup>3</sup>; Juan-Carlos Idrobo<sup>1</sup>; Jaekwang Lee<sup>3</sup>; Pu Yu<sup>4</sup>; Donovan Leonard<sup>1</sup>; Anas Mouti<sup>5</sup>; Beth Guiton<sup>5</sup>; Mark Oxley<sup>1</sup>; Albina Borisevich<sup>1</sup>; Sokrates Pantelides<sup>3</sup>; Ramamorthy Ramesh<sup>4</sup>; Jagdish Narayan<sup>2</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>North Carolina State University; <sup>3</sup>Vanderbilt University; <sup>4</sup>UC Berkeley; <sup>5</sup>University of Kentucky

### 8:20 AM Invited

**Ferroelectric Domain Scaling and Electronic Properties in Ultrathin BiFeO<sub>3</sub> Films on Vicinal Substrates:** *Arunava Gupta<sup>1</sup>*; Vilas Shelke<sup>1</sup>; Dipanjan Mazumdar<sup>1</sup>; Sergey Faleev<sup>1</sup>; Oleg Mryasov<sup>1</sup>; Stephen Jesse<sup>2</sup>; Sergei Kalinin<sup>2</sup>; Arthur Baddorf<sup>2</sup>; <sup>1</sup>University of Alabama; <sup>2</sup>Oak Ridge National Laboratory



**8:40 AM Invited**

**Investigations on Nanostructured Magnetoelectric Multiferroics:** *Ram Katiyar*<sup>1</sup>; Ashok Kumar<sup>1</sup>; Manoj Singh<sup>1</sup>; Nora Ortega<sup>1</sup>; Sandra Dussan<sup>1</sup>; James Scott<sup>2</sup>; <sup>1</sup>University of Puerto Rico; <sup>2</sup>University of Cambridge

**9:00 AM Invited**

**Quantum-Confined Metal Oxide Heterostructures:** *Lionel Vayssieres*<sup>1</sup>; <sup>1</sup>International Center for Materials NanoArchitectonics, National Institute for Materials Science

**9:20 AM**

**Vertically Aligned Nanocomposite Thin Films: From Strain Tuning to Novel Nanostructures:** Zhenxing Bi<sup>1</sup>; Aiping Chen<sup>1</sup>; Judith MacManus-Driscoll<sup>2</sup>; Quanxi Jia<sup>3</sup>; *Haiyan Wang*<sup>1</sup>; <sup>1</sup>Texas A&M University; <sup>2</sup>University of Cambridge; <sup>3</sup>Los Alamos National Laboratory

**9:40 AM Break****10:00 AM Invited**

**Self Assembly in Cerium Oxide Nanoparticles: Effect of Environment:** *S Seal*<sup>1</sup>; A Karakoti<sup>2</sup>; S Kuchibatla<sup>2</sup>; <sup>1</sup>UCF; <sup>2</sup>PNNL

**10:20 AM Invited**

**Fascinating World of Oxides:** *Ashutosh Tiwari*<sup>1</sup>; <sup>1</sup>University of Utah

**10:40 AM Invited**

**Ferromagnetism in Chemically Synthesized Nanoparticles of Antiferromagnetic Sm<sub>0.5</sub>Ca<sub>0.5</sub>MnO<sub>3</sub> and Nd<sub>0.4</sub>Sr<sub>0.6</sub>MnO<sub>3</sub> Charge Ordered Manganites:** *Tapan Nath*<sup>1</sup>; <sup>1</sup>Indian Institute of Technology Kharagpur

**11:00 AM**

**Structure-Property Correlations in Rare Earth Based Manganite Thin Films and Heterostructures:** *Sudhakar Nori*<sup>1</sup>; John Prater<sup>2</sup>; Jagdish Narayan<sup>1</sup>; <sup>1</sup>North Carolina State University; <sup>2</sup>Army Research Office

**11:20 AM Invited**

**Tailoring a Two-Dimensional Electron Gas at the LaAlO<sub>3</sub>/SrTiO<sub>3</sub> Interface by Polarization:** *Chang-Beom Eom*<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

**11:40 AM Invited**

**Growth Mechanisms and Electrochemical Properties of MnO<sub>2</sub> Nanowires with Unusual Twisted Structure:** Jay G. Simmons Jr.<sup>1</sup>; Yue Cai<sup>1</sup>; Jie Liu<sup>1</sup>; *Pani (Chakrapani) Varanasi*<sup>2</sup>; <sup>1</sup>Duke University; <sup>2</sup>U.S. Army Research Office

## International Symposium on Defects, Transport and Related Phenomena: Defects and Transport in Ceramics II

**Program Organizers:** Sangtae Kim, University of California, Davis; Ruediger Dieckmann, Cornell University; Doreen Edwards, Alfred University; Manfred Martin, RWTH Aachen University; Thomas Mason, Northwestern University

Tuesday AM  
October 18, 2011

Room: C122  
Location: Columbus Con. Center

**Funding support provided by:** WCU Hybrid Materials Program, Department of Materials Science and Engineering, Seoul National University, Korea

**Session Chairs:** Doreen Edwards, Alfred University; Shu Yamaguchi, The University of Tokyo

**8:00 AM Invited**

**Confinement Effects for Ionic Carriers in SrTiO<sub>3</sub> Ultrathin Films** *Eugene Kotomin*<sup>1</sup>; Denis Gryaznov<sup>2</sup>; Eugene Blokhin<sup>2</sup>; Robert Evarestov<sup>3</sup>; Vitaly Alexandrov<sup>4</sup>; Joachim Maier<sup>2</sup>; <sup>1</sup>Max Planck Institute; <sup>2</sup>Max Planck Institute; <sup>3</sup>St.Petersburg University; <sup>4</sup>University of California

**8:40 AM**

**Redox Kinetics and Diffusion in Lithium Niobate by Optical In Situ Spectroscopy:** *Jianmin Shi*<sup>1</sup>; Klaus-Dieter Becker<sup>1</sup>; <sup>1</sup>Technische Universität Braunschweig

**9:00 AM Invited**

**Direct Observation of Electrochemical Polarization in Oxide Thin Film Electrolyte under Intense Applied Field:** *Shu Yamaguchi*<sup>1</sup>; <sup>1</sup>The University of Tokyo

**9:40 AM Break****10:00 AM Invited**

**Point Defects and Their Impact in Dielectric and Piezoelectric Ceramics:** *Clive Randall*<sup>1</sup>; Soonil Lee<sup>1</sup>; Roni Levi<sup>1</sup>; Russell Maier<sup>1</sup>; Weiguo Qu<sup>1</sup>; Keisuke Kobayashi<sup>1</sup>; Noriyuki Inoue<sup>1</sup>; <sup>1</sup>Penn State University

**10:40 AM**

**Conduction Mechanisms in p-Type Rh<sub>2</sub>ZnO<sub>4</sub> and Co<sub>2</sub>ZnO<sub>4</sub> Spinel:** *Arpun Nagaraja*<sup>1</sup>; Nicola Perry<sup>1</sup>; Thomas Mason<sup>1</sup>; Yang Tang<sup>1</sup>; Matthew Grayson<sup>1</sup>; Tula Paudel<sup>2</sup>; Stephan Lany<sup>2</sup>; Alex Zunger<sup>2</sup>; <sup>1</sup>Northwestern University; <sup>2</sup>National Renewable Energy Laboratory

**11:00 AM Invited**

**Resolving Bulk and Grain Boundary Transport Properties of TiO<sub>2</sub> Thin Films Enabled by Laser-Induced Anisotropic Morphology:** *Avner Rothschild*<sup>1</sup>; Guy Ankonina<sup>1</sup>; Ui-Jin Chung<sup>2</sup>; Adrian Chitu<sup>2</sup>; Yigal Komem<sup>1</sup>; <sup>1</sup>Technion - Israel Inst. Tech.; <sup>2</sup>Columbia University

**11:40 AM**

**Beta Gallia Rutile Intergrowths as Thermoelectric Oxides:** *Doreen Edwards*<sup>1</sup>; Kyle Scott<sup>1</sup>; <sup>1</sup>Alfred University

## Joining of Advanced and Specialty Materials (JASM XIII): Welding Consumables

**Program Organizers:** Judith Schneider, Mississippi State University; Norman Zhou, Univ. of Waterloo; Leijun Li, Utah State University; Mathieu Brochu, McGill University; Boian Alexandrov, The Ohio State University; Michael Halbig, U.S. Army Research Laboratory; Akio Hirose, Osaka University; Sammy Tin, Illinois Institute of Technology

Tuesday AM  
October 18, 2011

Room: E161B  
Location: Columbus Con. Center

**Session Chairs:** Boian Alexandrov, The Ohio State University; Leijun Li, Utah State University

**8:00 AM Keynote**

**Emerging Materials Joining Challenges and Technology Needs: An Industry Perspective:** *Henry J. Cialone*<sup>1</sup>; <sup>1</sup>Edison Welding Institute

**8:40 AM**

**Solidification Cracking Study of High Chromium Nickel-Base Filler Metals Developed for Nuclear Power Applications**

: *Steven L. McCracken*<sup>1</sup>; Boian T. Alexandrov<sup>2</sup>; John C. Lippold<sup>2</sup>; Adam T. Hope<sup>2</sup>; Benjamin J. Sutton<sup>2</sup>; <sup>1</sup>Electric Power Research Institute; <sup>2</sup>The Ohio State University

**9:00 AM**

**Development of a Cracking Resistant, High-Chromium Nickel-Base Filler Metal for Nuclear Power Plant Construction and Repair Applications:** *Adam Hope*<sup>1</sup>; Eric Fusner<sup>1</sup>; John Lippold<sup>1</sup>; <sup>1</sup>The Ohio State University

**9:20 AM**

**The Effect of Flux Coating Modification of ENiCrMo-4 and ENiMo-10 Shielded Metal Arc Welding Consumables:** *Brian Gaal*<sup>1</sup>; <sup>1</sup>Electrode Engineering

## 9:40 AM Break

### 10:00 AM

#### Introduction and Validation of Cr-Free Consumables

**for Welding Stainless Steels:** *Boian Alexandrov*<sup>1</sup>; Matthew Gonser<sup>2</sup>; Brian Gaal<sup>3</sup>; John Lippold<sup>4</sup>; Kathleen Paulson<sup>4</sup>; Franklin Turner<sup>3</sup>; William Newell<sup>5</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Consultant; <sup>3</sup>Electrode Engineering Inc.; <sup>4</sup>NAVFAC Engineering Service Center; <sup>5</sup>Euroweld Ltd

### 10:20 AM

#### Characterization of the Heat-Affected Zone in Flux-Cored Arc Welded Heavy Section P91:

Andrew Deceuster<sup>1</sup>; Benjamin Griffiths<sup>1</sup>; *Leijun Li*<sup>1</sup>;

<sup>1</sup>Utah State University

### 10:40 AM

#### Optimization of an SMAW Consumable for Grade 91 Creep Strength Enhanced Ferritic Steel in Power Generation Applications:

*Daniel Saltzmann*<sup>1</sup>; Boian Alexandrov<sup>1</sup>; John Lippold<sup>1</sup>; <sup>1</sup>The Ohio State University

### 11:00 AM

#### Post-Weld Heat Treatment of Heavy Section P91 Welds:

Benjamin Griffiths<sup>1</sup>; Andrew Deceuster<sup>1</sup>; Bishal Silwal<sup>1</sup>; *Leijun Li*<sup>1</sup>; <sup>1</sup>Utah State University

### 11:20 AM

#### The Benefits of Using Flux in the Development of New Weld Metals for Use on P91 Steels:

*Brian Gaal*<sup>1</sup>; <sup>1</sup>Electrode Engineering

### 11:40 AM

#### Investigation of PWHT Response and Phase Transformation Behavior of F22 Steel:

*Eric Fusner*<sup>1</sup>; John Lippold<sup>1</sup>; <sup>1</sup>OSU Welding and Joining Metallurgy Group

## Laser Applications in Materials Technology (II): Mechanical Properties of Additive Manufactured Materials and Components

*Program Organizer:* Stephen Copley, Penn State

Tuesday AM  
October 18, 2011

Room: E161A  
Location: Columbus Con. Center

*Session Chairs:* Michael Rigdon, Institute for Defense Analyses; William Frazier, Naval Air Systems Command

### 8:00 AM Keynote

#### Transitioning Titanium Metal Additive Manufacturing Products to Aerospace Systems:

Ricky Martin<sup>1</sup>; *Kevin Slattery*<sup>1</sup>; David Dietrich<sup>1</sup>; <sup>1</sup>Boeing

### 8:40 AM Invited

#### Overview of Structure and Properties of Metals and Alloys Fabricated by Direct Metal Deposition:

*Jyotirmoy Mazumder*<sup>1</sup>; Sudip Bhattacharyya<sup>1</sup>; Bhaskar Dutta<sup>1</sup>; <sup>1</sup>University of Michigan

### 9:00 AM Invited

#### Mechanical Property Design Using Laser Engineered Net Shaping (\8482LENS\8482):

*John Smugeresky*<sup>1</sup>; David Keicher<sup>2</sup>; Richard Grylls<sup>2</sup>; <sup>1</sup>Sandia National Laboratories, CA; <sup>2</sup>Optomec Design company

### 9:20 AM Invited

#### Mechanical Properties of Laser Deposited Ti-6Al-4V for Repair Applications:

*Shawn Kelly*<sup>1</sup>; <sup>1</sup>Applied Research Laboratory, Penn State University

## 9:40 AM Break

### 10:00 AM Invited

#### Mechanical Properties of Lased-Based Additive Manufactured Materials and Parts:

*David Bourell*<sup>1</sup>; <sup>1</sup>University of Texas

### 10:20 AM Invited

#### Laser-Based Material Deposition, Consolidation, & Removal Technologies: Road to Adoption:

*Constance Philips*<sup>1</sup>; <sup>1</sup>NCMS

### 10:40 AM Invited

#### Material Property Characterization of Parts Made with a Metal-Based Additive Manufacturing Process:

*April Cooke*<sup>1</sup>; John Slotwinski<sup>2</sup>; <sup>1</sup>National Institute of Standards and Technology/University of Maryland at College Park; <sup>2</sup>National Institute for Standards and Technology

### 11:00 AM Invited

#### Mechanical Properties of Laser Deposited Ti-6Al-4V Using Recycled Powder:

*Shawn Kelly*<sup>1</sup>; Michael Policelli<sup>1</sup>; Kenneth Meinert<sup>1</sup>; Binky Sargent<sup>2</sup>; Paul Prichard<sup>2</sup>; <sup>1</sup>Applied Research Laboratory, Penn State University; <sup>2</sup>Kennametal, Inc.

### 11:20 AM Invited

#### Fabrication and Certification of EBF3 Aluminum Components for International Space Station Support:

*Craig Brice*<sup>1</sup>; Karen Taminger<sup>1</sup>; Rob Hafley<sup>1</sup>; Mike Waid<sup>1</sup>; Daila Gonzalez<sup>1</sup>; <sup>1</sup>NASA Langley Research Center

### 11:40 AM Invited

#### On Making Additive Manufacturing a Production Technology:

*Khershed Cooper*<sup>1</sup>; Ralph Wachter<sup>2</sup>; <sup>1</sup>Naval Research Laboratory; <sup>2</sup>Office of Naval Research

### 12:00 PM Invited

#### Laser and Electron Beam Sintering of ZrB<sub>2</sub>-Based Cermets:

*Mool Gupta*<sup>1</sup>; Tyson Baldridge<sup>1</sup>; Chen-Nan Sun<sup>1</sup>; <sup>1</sup>UVA

## Localized Corrosion -- Measurement, Mechanisms and Mitigation: Assorted Effects

*Program Organizer:* Gerald Frankel, Ohio State University

Tuesday AM  
October 18, 2011

Room: D244/245  
Location: Columbus Con. Center

*Session Chair:* Gerald Frankel, The Ohio State University

### 8:00 AM

#### Study of Carbon Steel Corrosion at the Liquid-Air Interface in Simulated Nuclear Waste Solutions:

*Xiaoji Li*<sup>1</sup>; Feng Gui<sup>2</sup>; Sean Brossia<sup>2</sup>; Gerald Frankel<sup>1</sup>; <sup>1</sup>the Ohio State University; <sup>2</sup>DNV Columbus, Inc.

### 8:20 AM

#### Mitigation of Microbiologically Influenced Corrosion Using High Frequency Ultrasonic Techniques:

*Hussain Almahamedh*<sup>1</sup>; Douglas Meegan<sup>1</sup>; Brajendra Mishra<sup>1</sup>; David Olson<sup>1</sup>; <sup>1</sup>Colorado School of Mines

### 8:40 AM

#### Pitting Corrosion of Cu in Various Atmospheric Environments with Ozone and UV Radiation:

*Huang Lin*<sup>1</sup>; Gerald Frankel<sup>1</sup>; Mark Jaworowski<sup>2</sup>; <sup>1</sup>Fontana Corrosion Center, The Ohio State University; <sup>2</sup>United Technologies Research Center

### 9:00 AM

#### Electropolishing of Niobium to Obtain Defect Free Surface:

*Ashwini Chandra*<sup>1</sup>; Gerald Frankel<sup>1</sup>; Michael Sumption<sup>1</sup>; <sup>1</sup>The Ohio State University

9:20 AM

**The Influence of Sulfate Reducing Bacteria Metabolic Reactions on the Corrosion Behaviour of API-5L X65 Carbon Steel Pipeline:** *Faisal Al-Abbas*<sup>1</sup>; Arshad Bajvani Gavanluei<sup>2</sup>; David Olson<sup>2</sup>; Brajendra Mishra<sup>2</sup>; Antony Kakpovbia<sup>1</sup>; John Spear<sup>2</sup>; Tariq Al-Ghamdi<sup>2</sup>; <sup>1</sup>Saudi Aramco; <sup>2</sup>Colorado School of Mines

9:40 AM Break

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## Localized Corrosion -- Measurement, Mechanisms and Mitigation: High Temperature Corrosion

*Program Organizer:* Gerald Frankel, Ohio State University

Tuesday AM  
October 18, 2011

Room: D244/245  
Location: Columbus Con. Center

*Session Chair:* Gerald Frankel, The Ohio State University

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10:00 AM

**A Review of Experiences with AL-6XN® and ZERON® 100 Alloys in Air Pollution Control Systems:** *Devin Wachowiak*<sup>1</sup>; <sup>1</sup>Rolled Alloys

10:20 AM

**Effect of Applied Stress, Crystal Orientation, and Phase on Hot Corrosion of CMSX-4 by Sodium Sulfate:** *Pongpat Lortrakul*<sup>1</sup>; Rodney Trice<sup>1</sup>; Kevin Trumble<sup>1</sup>; <sup>1</sup>Purdue University

10:40 AM

**Localized Attack in FGD Air Pollution Control Vessels:** *Debajyoti Maitra*<sup>1</sup>; Lewis Shoemaker<sup>1</sup>; Jim Crum<sup>1</sup>; <sup>1</sup>Special Metals Corporation

11:00 AM

**An Atomistic Study of Oxidation Initiation on Different Kinds of FCC Fe-Cr Binary Alloy Surfaces:** *Nishith Das*<sup>1</sup>; Tetsuo Shoji<sup>1</sup>; <sup>1</sup>Tohoku University

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## Magnetoelectric Multiferroic Thin Films and Multilayers: Multiferroic Materials

*Program Organizer:* Shashank Priya, Virginia Tech

Tuesday AM  
October 18, 2011

Room: C221  
Location: Columbus Con. Center

*Session Chair:* Ashok Kumar, University of Puerto Rico

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8:00 AM

**A Firm Foundation for Sr<sub>2</sub>FeMoO<sub>6</sub>: Design and Synthesis of Double Perovskite Substrate Materials:** *Alexanne Holcombe*<sup>1</sup>; Patricia Morris<sup>1</sup>; <sup>1</sup>The Ohio State University

8:20 AM

**BaTiO<sub>3</sub> Based Two-Phase Nanorods:** *Yaodong Yang*<sup>1</sup>; Yanxi Li<sup>1</sup>; Jie-Fang Li<sup>1</sup>; D Viehland<sup>1</sup>; <sup>1</sup>Virginia Tech

8:40 AM Invited

**Converse Magneto-Electric Coupling in Magnetoelectric Hexaferrite:** *Ashok Kumar*<sup>1</sup>; Ram Katiyar<sup>1</sup>; <sup>1</sup>University of Puerto Rico

9:00 AM

**Effect of Magnetic Field Annealing on Magnetic and Magnetoelectric Properties of Sol-Gel Derived NiFe<sub>2</sub>O<sub>4</sub> and Pb(Zr<sub>0.52</sub>Ti<sub>0.48</sub>)O<sub>3</sub> Thin Film Multilayer Composites:** *Safoura Seifkar*<sup>1</sup>; Xiaotao Liu<sup>1</sup>; Frank Hunte<sup>1</sup>; Yaser Bastani<sup>2</sup>; Nazanin Bassiri Gharb<sup>2</sup>; Justin Schwartz<sup>1</sup>; <sup>1</sup>North Carolina State University; <sup>2</sup>Georgia Institute of technology

9:20 AM Break

9:40 AM

**Increased Octahedral In-Phase Tilting in Na<sub>1/2</sub>Bi<sub>1/2</sub>TiO<sub>3</sub> Single Crystals with BaTiO<sub>3</sub>: A TEM Study:** *Jianjun Yao*<sup>1</sup>; Yaodong Yang<sup>1</sup>; Niven Monsegue<sup>1</sup>; Yanxi Li<sup>1</sup>; Jiefang Li<sup>1</sup>; Qinhui Zhang<sup>2</sup>; Haosu Luo<sup>2</sup>; Wenwei Ge<sup>1</sup>; Dwight Viehland<sup>1</sup>; <sup>1</sup>Virginia Tech; <sup>2</sup>Shanghai Institute of Ceramics, Chinese Academy of Sciences

10:00 AM

**New Solid And Soft Magnetoelectrics:** *Zdravko Kutnjak*<sup>1</sup>; Brigita Rozic<sup>1</sup>; Marko Jagodic<sup>2</sup>; Saso Gyergyek<sup>1</sup>; Miha Drofenik<sup>1</sup>; Denis Arcon<sup>1</sup>; <sup>1</sup>Jozef Stefan Institute; <sup>2</sup>Institute of Mathematics, Physics and Mechanics

10:20 AM

**Magnetic and Ferroelectric Properties of Sol-Gel Derived NiFe<sub>2</sub>O<sub>4</sub> and Pb(Zr<sub>0.52</sub>Ti<sub>0.48</sub>)O<sub>3</sub> Thin Film Multilayer Composites on Silicon Substrates (100):** *Safoura Seifkar*<sup>1</sup>; Xiatao Liu<sup>1</sup>; Frank Hunte<sup>1</sup>; Yaser Bastani<sup>2</sup>; Christopher Quintero<sup>2</sup>; Nazanin Bassiri Gharb<sup>2</sup>; Justin Schwartz<sup>1</sup>; <sup>1</sup>North Carolina State University; <sup>2</sup>Georgia Institute of technology

10:40 AM

**Periodicity-Dependence of the Magnetic Properties in BFO/LSMO Superlattices by LMBE:** *Jie Xiong*<sup>1</sup>; Bowan Tao<sup>2</sup>; Quanxi Jia<sup>1</sup>; Yanrong Li<sup>2</sup>; <sup>1</sup>Los Alamos National Laboratory; <sup>2</sup>University of Electronic Science and Technology of China

11:00 AM

**Thickness Effects in LSMO/PZT Thin Films:** *Mikel Holcomb*<sup>1</sup>; Srinivas Polisetty<sup>1</sup>; Jinling Zhou<sup>1</sup>; Disheng Chen<sup>1</sup>; Evan Wolfe<sup>1</sup>; Charles Frye<sup>1</sup>; Catherine Jenkins<sup>2</sup>; Andreas Scholl<sup>2</sup>; Ying-Hao Chu<sup>3</sup>; Lane Martin<sup>4</sup>; <sup>1</sup>West Virginia University; <sup>2</sup>Advanced Light Source (LBNL); <sup>3</sup>National Chiao Tung University; <sup>4</sup>University of Illinois at Urbana-Champaign

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## Materials Science Challenges for Nuclear Applications: Defects and Diffusion in Materials

*Program Organizers:* Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprashad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Tuesday AM  
October 18, 2011

Room: C225  
Location: Columbus Con. Center

*Session Chairs:* Paul Millett, Idaho National Laboratory; Ram Devanathan, Pacific Northwest National Laboratory

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10:00 AM Invited

**Defects and Transport Processes in Beryllium:** Simon Middleburg<sup>1</sup>; Robin Grimes<sup>1</sup>; <sup>1</sup>Imperial College London

10:40 AM

**Insights on Ag and Cs Diffusion in SiC:** *Tyler Gerczak*<sup>1</sup>; Todd Allen<sup>1</sup>; Noriko Kita<sup>1</sup>; Zihua Zhu<sup>2</sup>; <sup>1</sup>University of Wisconsin-Madison; <sup>2</sup>Pacific Northwest National Laboratory

11:00 AM

**Reaction Diffusion between Uranium and Iron:** *Ke Huang*<sup>1</sup>; Youngjoo Park<sup>1</sup>; Ashley Ewh<sup>1</sup>; Bulent Sencer<sup>2</sup>; J. Kennedy<sup>2</sup>; Yongho Sohn<sup>1</sup>; <sup>1</sup>University of Central Florida; <sup>2</sup>Idaho National Laboratory

11:20 AM

**Phase-Field Modeling of Void Migration in Nuclear Fuels Due to a Temperature Gradient:** *Liangzhe Zhang*<sup>1</sup>; Michael Tonks<sup>1</sup>; Paul Millett<sup>1</sup>; Bulent Biner<sup>1</sup>; Yongfeng Zhang<sup>1</sup>; Karthikeyan Chockalingam<sup>1</sup>; <sup>1</sup>Idaho National Laboratory

11:40 AM

**Effects of Impurities on the Grain Boundary Penetration of Nickel by Liquid Bismuth:** *Kaveh Meshinchi Asl*<sup>1</sup>; Jian Luo<sup>1</sup>; <sup>1</sup>Clemson University

## Materials Science Challenges for Nuclear Applications: Simulation of Reactor Materials

**Program Organizers:** Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprasad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Tuesday AM  
October 18, 2011

Room: C225  
Location: Columbus Con. Center

**Session Chairs:** Ram Devanathan, Pacific Northwest National Laboratory; Samrat Choudhury, Los Alamos National Laboratory

8:00 AM Invited

**CASL: The Consortium for Advanced Simulation of Light Water Reactors: A U.S. Department of Energy Innovation Hub:** Douglas B. Kothe<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory

8:40 AM

**First Principles Calculations of Y<sub>2</sub>O<sub>3</sub> Interface with Ferritic Matrix:** *Samrat Choudhury*<sup>1</sup>; Christopher Stanek<sup>1</sup>; Blas Uberuaga<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

9:00 AM

**Constitutive Model for Irradiation Creep of HT9 to High Doses:** *Micah Hackett*<sup>1</sup>; Gary Povirk<sup>1</sup>; <sup>1</sup>TerraPower, LLC

9:20 AM

**Multi-Scale Examination of the Effect of S3<sup>n</sup> Grain Boundaries on Irradiation-Induced Defects:** *Christopher Barr*<sup>1</sup>; Greg Vetterick<sup>1</sup>; Marquis Kirk<sup>2</sup>; Khalid Hatter<sup>3</sup>; Mitra Taheri<sup>1</sup>; <sup>1</sup>Drexel University; <sup>2</sup>Argonne National Laboratory; <sup>3</sup>Sandia National Laboratory

9:40 AM Break

## Multi Scale Modeling of Microstructure Deformation in Material Processing: Session II

**Program Organizer:** Lukasz Madej, Akademia Gornicza Hutnicza

Tuesday AM  
October 18, 2011

Room: C211  
Location: Columbus Con. Center

**Session Chair:** Mark Tschopp, Center for Advanced Vehicular Systems Mississippi State University

8:00 AM

**Simulation of Dynamic Recrystallization for Ultrahigh Strength Steel Using Cellular Automation:** *Huang quan*<sup>1</sup>; Yi ping<sup>1</sup>; <sup>1</sup>School of Mechanical and Electrical Engineering, Central South University

8:20 AM

**Statistical Approaches Applied to Failure of Isotropic Materials with Random Cracks:** *Ozgur Keles*<sup>1</sup>; Edwin Garcia<sup>1</sup>; Keith Bowman<sup>1</sup>; <sup>1</sup>Purdue University

8:40 AM

**Development of finite element procedures to model the behavior of ultra fine-grained and nanocrystalline grain structures during Equal-Channel Angular Press (ECAP) processing of metals:** Kazeem Sanusi<sup>1</sup>; Gert Oosthuizen<sup>1</sup>; Pieter Eksteen<sup>1</sup>; <sup>1</sup>University of Stellenbosch

9:00 AM

**Multiscale Modeling of the Deformation Inhomogeneity in the Angular Accumulative Drawing Process:** *Krzysztof Muszka*<sup>1</sup>; J. Majta<sup>1</sup>; K. Doniec<sup>1</sup>; D. Dziedzic<sup>1</sup>; <sup>1</sup>AGH Univeristy of Science and Technology

9:20 AM

**Three-Phase Regions with the Reaction Type Changing:** *Vasily Lutsyk*<sup>1</sup>; Vladimir Savinov<sup>2</sup>; <sup>1</sup>Buryat State University; <sup>2</sup>Institute of Physical Materials Science

## Multifunctional Oxides: Session II

**Program Organizer:** Xiaoqing Pan, University of Michigan

Tuesday AM  
October 18, 2011

Room: E162A  
Location: Columbus Con. Center

**Session Chairs:** Chonglin Chen, University of Texas at San Antonio; Chris Nelson, University of Michigan

8:00 AM Invited

**Formation and Switching of Improper Ferroelectric Domains in Epitaxial Polar Ferrimagnetic Oxide Thin Films:** Ji Hye Lee<sup>1</sup>; William Jo<sup>1</sup>; <sup>1</sup>Ewha Womans University

8:40 AM

**Ferroelectric Domains in Textured Polycrystalline Bismuth Sodium Titanate Piezoelectric Ceramics:** *Jake Jokisaari*<sup>1</sup>; M.B. Katz<sup>1</sup>; T. Tani<sup>2</sup>; X.Q. Pan<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>Toyota Technological Institute

9:00 AM Invited

**In-Situ Ferroelectric Switching of Multiferroic BiFeO<sub>3</sub> Thin Films for Magnetoelectric Applications:** *Christopher Nelson*<sup>1</sup>; Benjamin Winchester<sup>2</sup>; Yi Zhang<sup>1</sup>; Sung-Joo Kim<sup>1</sup>; Jake Jokisaari<sup>1</sup>; Alexander Melville<sup>3</sup>; Carolina Adamo<sup>3</sup>; Chad Folkman<sup>4</sup>; Seung-Hyub Baek<sup>4</sup>; Chang-Beom Eom<sup>4</sup>; Seung-Hyub Baek; Darrell Schlom<sup>3</sup>; Long-Qing Chen<sup>2</sup>; Xiaoqing Pan<sup>1</sup>; <sup>1</sup>University of Wisconsin; <sup>2</sup>Penn State University; <sup>3</sup>Cornell University; <sup>4</sup>University of Wisconsin

9:40 AM Break

10:00 AM

**Study of Domain Structures of Lead-Free Na<sub>1/2</sub>Bi<sub>1/2</sub>TiO<sub>3</sub>-BaTiO<sub>3</sub> Crystals:** *Jianjun Yao*<sup>1</sup>; LI YAN<sup>1</sup>; Wenwei GE<sup>1</sup>; Jiefang Li<sup>1</sup>; Dwight Viehland<sup>1</sup>; Qinhui Zhang<sup>2</sup>; Haosu Luo<sup>2</sup>; <sup>1</sup>Virginia Tech; <sup>2</sup>Shanghai Institute of Ceramics, Chinese Academy of Sciences,

10:20 AM

**Real-Time Switching of Multiferroic Lead Zirconate Titanate Thin Films:** *Peng Gao*<sup>1</sup>; Chris Nelson<sup>1</sup>; Jake Jokisaari<sup>1</sup>; Seung-Hyub Baek<sup>2</sup>; Chang-Beom Eom<sup>2</sup>; Enge Wang<sup>3</sup>; Xiaoqing Pan<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>University of Wisconsin-Madison; <sup>3</sup>Peking University

10:40 AM

**Mapping and Statistics of BiFeO<sub>3</sub> Domain Boundary Angles and Types:** Joseph Desmarais<sup>1</sup>; Alejandro Llubes<sup>1</sup>; Linghan Ye<sup>1</sup>; Jon Ihlefeld<sup>2</sup>; Bryan Huey<sup>1</sup>; <sup>1</sup>University of Connecticut; <sup>2</sup>Sandia National Laboratories



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## Nano- and Atomic-Scale Fracture: Atomistics of Fracture

*Program Organizers:* Lawrence Friedman, NIST; Stephen Freiman, NIST

Tuesday AM                      Room: C125  
October 18, 2011              Location: Columbus Con. Center

*Session Chair:* Steve Freiman, Freiman Consulting

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### 8:00 AM

**Atomic-Scale Fracture of Brittle Solids:** *Michael Marder*<sup>1</sup>; <sup>1</sup>UT Austin

### 8:40 AM

**Consistent Embedding: A Multi-Scale Approach to Brittle Fracture:** *Keith Runge*<sup>1</sup>; Krishna Muralidharan<sup>2</sup>; Pierre Deymier<sup>2</sup>; <sup>1</sup>University of Florida; <sup>2</sup>University of Arizona

### 9:20 AM

**Crack Tip Processes: Does Size Matter?:** *John Mecholsky*<sup>1</sup>; Stephen Freiman<sup>2</sup>; <sup>1</sup>University of Florida; <sup>2</sup>Freiman Consulting

### 9:40 AM Break

### 10:00 AM

**In-Situ TEM on Nano-Crack Nucleation in Dislocation Free Zone:** *Scott Mao*<sup>1</sup>; <sup>1</sup>University of Pittsburgh

### 10:20 AM

**Tough Glass:** *Robert Ritchie*<sup>1</sup>; Marios Demetriou<sup>2</sup>; Douglas Hofmann<sup>2</sup>; Maximilian Launey<sup>3</sup>; William Johnson<sup>2</sup>; <sup>1</sup>University of California Berkeley; <sup>2</sup>California Institute of Technology; <sup>3</sup>Cordis Corp.

### 11:00 AM

**Fracture in Hybrid Molecular Films: Experiments and Computational Models:** *Reinhold Dauskardt*<sup>1</sup>; <sup>1</sup>Stanford University

### 11:40 AM

**In-Situ Observation of Crack Propagation Behavior of Silicon Nitride Ceramics by Scanning Probe Microscopy:** *Junichi Tatami*<sup>1</sup>; Masahiro Ohnishi<sup>1</sup>; Toru Wakihara<sup>1</sup>; Katsutoshi Komeya<sup>1</sup>; Takeshi Meguro<sup>1</sup>; <sup>1</sup>Yokohama National University

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## Next Generation Biomaterials: Tissue Engineering

*Program Organizers:* Roger Narayan, Univ of North Carolina & North Carolina State Univ; Kalpana Katti, North Dakota State University; Kajal Mallick, University of Warwick; Vilupanur Ravi, California State Polytechnic University, Pomona; Varshni Singh, Louisiana State University

Tuesday AM                      Room: C215  
October 18, 2011              Location: Columbus Con. Center

*Session Chairs:* Ulrike Wegst, Dartmouth College; Otto Wilson, Catholic University of America

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### 8:00 AM Invited

**Materials Development for Biomimetic Engineered Skin Mechanics:** *Heather Powell*<sup>1</sup>; <sup>1</sup>The Ohio State University

### 8:20 AM Invited

**Fabrication Approaches and Characterization of Porous 3D Bioscaffolds for Hard Tissue Augmentation:** *Kajal Mallick*<sup>1</sup>; James Winnett<sup>1</sup>; Gwendolen Reilly<sup>2</sup>; William van Grunsven<sup>3</sup>; James Lapworth<sup>3</sup>; <sup>1</sup>University of Warwick; <sup>2</sup>University of Sheffield; <sup>3</sup>University of Sheffield

### 8:40 AM Invited

**Degradation of Tailored Amorphous Multi Porous (TAMP) Bioscaffolds:** Di Zhang<sup>1</sup>; Shojie Wang<sup>1</sup>; Leena Hupa<sup>2</sup>; Himanshu Jain<sup>1</sup>; <sup>1</sup>Lehigh University; <sup>2</sup>Abo Akademi

### 9:00 AM Invited

**Biologically Inspired Origami (BIO) Paper for Tissue Engineering Scaffolds:** *Otto Wilson*<sup>1</sup>; Mallory Vogel<sup>1</sup>; Patrick Mehl<sup>1</sup>; Olumide Ojeifo<sup>1</sup>; <sup>1</sup>Catholic University of America

### 9:20 AM Invited

**Hybrid Biomaterials:** *Ulrike Wegst*<sup>1</sup>; <sup>1</sup>Drexel University

### 9:40 AM Break

### 10:00 AM

**Synthesis and Characterization of Gel Casting and Freeze Casting Derived Porous Bioceramic Scaffolds:** *Anouska Nithyanandan*<sup>1</sup>; Kajal Mallick<sup>1</sup>; <sup>1</sup>University of Warwick

### 10:20 AM Invited

**Influence of Scaffold Hydration on Fiber Geometry and Extension:** Greg Ebersole<sup>1</sup>; Jackie Ohmura<sup>1</sup>; Peter Anderson<sup>1</sup>; *Heather Powell*<sup>1</sup>; <sup>1</sup>The Ohio State University

### 10:40 AM

**Multi-Scale Porosity in Artificial Bone Scaffolds by Robocasting:** *Yang Shi*<sup>1</sup>; James Smay<sup>1</sup>; <sup>1</sup>Oklahoma State University

### 11:00 AM

**Mechanical and Microstructural Characterization of 45S5 Bioglass® Scaffolds for Tissue Engineering:** *Ena Athenea Aguilar-Reyes*<sup>1</sup>; Louis-Philippe Lefebvre<sup>2</sup>; Carlos Alberto León-Patiño<sup>1</sup>; Benito Jacinto-Díaz<sup>1</sup>; Erasmo Perdomo-Cervantes<sup>1</sup>; <sup>1</sup>Universidad Michoacana de San Nicolás de Hidalgo; <sup>2</sup>National Research Council Canada, Industrial Materials Institute

### 11:20 AM

**Post-Electrospinning Modification of Chitosan Fibers:** *Marjorie Austero*<sup>1</sup>; Amanda Toth<sup>1</sup>; Caroline Schauer<sup>1</sup>; <sup>1</sup>Drexel University

### 11:40 AM

**Biodegradable Polymer-Hydroxyapatite Composite Scaffolds: Fabrication and Properties:** ARSALAN AHMED<sup>1</sup>; *Mohammad Mujahid*<sup>1</sup>; <sup>1</sup>National University of Science and Technology

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## Novel Sintering Processes and News in Traditional Sintering and Grain Growth: Field Assisted and NanoSintering I

*Program Organizers:* Ricardo H. R. Castro, University of California at Davis; Douglas Gouvêa, Universidade de São Paulo

Tuesday AM                      Room: C222  
October 18, 2011              Location: Columbus Con. Center

*Session Chair:* To Be Announced

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### 8:00 AM

**Thermal Stability of Cryomilled Al Alloy during Spark Plasma Sintering:** *Yuhong Xiong*<sup>1</sup>; Dongming Liu<sup>1</sup>; Ying Li<sup>1</sup>; Chris Haines<sup>2</sup>; Joseph Paras<sup>2</sup>; Darold Martin<sup>2</sup>; Deepak Kapoor<sup>2</sup>; Enrique Lavernia<sup>1</sup>; Julie Schoenung<sup>1</sup>; <sup>1</sup>University of California; <sup>2</sup>US Army

### 8:20 AM

**Synthesis of Nanostructured (Bi,Sb)<sub>2</sub>Te<sub>3</sub> Alloys by Spark Plasma Sintering:** *Zhihui Zhang*<sup>1</sup>; Yizhang Zhou<sup>1</sup>; Enrique Lavernia<sup>1</sup>; Nancy Yang<sup>2</sup>; Ryan Nishimoto<sup>2</sup>; Peter Sharma<sup>2</sup>; <sup>1</sup>UC Davis; <sup>2</sup>Sandia National Laboratories

## 8:40 AM

**Thermal Stability of Al 5356 Processed by Cryomilling and Spark Plasma Sintering:** *Bamidele Akinrinlola<sup>1</sup>; Mathieu Brochu<sup>1</sup>; Raynald Gauvin<sup>1</sup>; <sup>1</sup>McGill University*

## 9:00 AM Invited

**Field Assisted Sintering of Oxide Ceramics: New Mechanisms:** *Sebastian Schwarz<sup>1</sup>; Raschid Baraki<sup>1</sup>; Andrew Thorn<sup>2</sup>; Klaus van Benthem<sup>2</sup>; Olivier Guillon<sup>1</sup>; <sup>1</sup>Technische Universität Darmstadt; <sup>2</sup>UC Davis*

## 9:40 AM Break

## 10:00 AM Invited

**New Insights on SPS Sintering Mechanisms:** *Vincent Garnier<sup>1</sup>; Yann Aman<sup>2</sup>; Elisabeth Djurado<sup>3</sup>; <sup>1</sup>Université de Lyon - Insa de Lyon; <sup>2</sup>Insa de Lyon; <sup>3</sup>INP Grenoble*

## 10:40 AM Invited

**Densification and Preservation of the Ceramic Nanocrystalline Character by Spark Plasma Sintering:** *Rachman Chaim<sup>1</sup>; Rachel Marder<sup>1</sup>; Claude Estournes<sup>2</sup>; Zhijian Shen<sup>3</sup>; <sup>1</sup>Technion - Israel Institute of Technology; <sup>2</sup>CNRS, Institut Carnot Cirimat; <sup>3</sup>Stockholm University*

## 11:20 AM

**On the Effects of Local Joule Heating during the Electric Field Assisted Sintering of Ionic Ceramics:** *Troy Holland<sup>1</sup>; Umberto Anselmi-Tamburini<sup>2</sup>; Dat Quach<sup>1</sup>; Tien Tran<sup>1</sup>; Joanna Groza<sup>1</sup>; Amiya Mukherjee<sup>1</sup>; <sup>1</sup>University of California, Davis; <sup>2</sup>University of Pavia*

## 11:40 AM

**On the Local Field Strengths during Early Stage Electric Field Assisted Sintering of Ionic Ceramics:** *Troy Holland<sup>1</sup>; Umberto Anselmi-Tamburini<sup>2</sup>; Dat Quach<sup>1</sup>; Tien Tran<sup>1</sup>; Joanna Groza<sup>1</sup>; Amiya Mukherjee<sup>1</sup>; <sup>1</sup>University of California, Davis; <sup>2</sup>University of Pavia*

## Pb-Free Solders and Next Generation Interconnects: Electromigration and Reliability Issues of Pb-Free Solders

*Program Organizers:* Sehoon Yoo, Korea Institute of Industrial Technology; Andre Lee, Michigan State University; Govindarajan Muralidharan, Oak Ridge National Laboratory; Young-Ho Kim, Hanyang University

Tuesday AM  
October 18, 2011

Room: E160B  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

## 8:00 AM

**Evaluation of Lead-free Solder Reliability on Vibration Environment:** *Yong-Ho Ko<sup>1</sup>; Young-Kyu Lee<sup>2</sup>; Sehoon Yoo<sup>1</sup>; Chang-Woo Lee<sup>1</sup>; <sup>1</sup>Micro-Joining Center, Korea Institute of Industrial Technology, Incheon, 406-840, Korea; <sup>2</sup>Dept. of Electronic Packaging Engineering, University of Science & Technology, Daejeon, 305-333, Korea*

## 8:20 AM

**Factors Affecting the Dynamic Bending Reliability of Pb-Free Solder Joints in Board Level BGA and Bare Si-Die Flip Chip Packages:** *Jae-Won Jang<sup>1</sup>; A-Mi Yu<sup>1</sup>; Jong-Hyun Lee<sup>2</sup>; Mok-Soon Kim<sup>3</sup>; Jun-Ki Kim<sup>1</sup>; <sup>1</sup>Korea Institute of Industrial Technology; <sup>2</sup>Seoul National University of Science & Technology; <sup>3</sup>Inha University*

## 8:40 AM Invited

**Application of Cu-Zn Alloy Solder Wetting Layer for Pb-Free Solders:** *Young Min Kim<sup>1</sup>; Young-Ho Kim<sup>1</sup>; <sup>1</sup>Hanyang University*

## 9:20 AM Cancelled

**Interplay of Electromigration-Induced Voids and Thermal Cycles on Failure Lifetime in Flip-Chip Solder Joints:** *Jiayong Meng<sup>1</sup>; Yunqiang Yang<sup>2</sup>; Yanfei Gao<sup>1</sup>; <sup>1</sup>Univ of Tennessee; <sup>2</sup>Agilent Technologies Inc*

## 9:40 AM Break

## 10:00 AM

**Electromigration Behavior in In-Situ Cu<sub>6</sub>Sn<sub>5</sub> Reinforced Eutectic SnAg Composite Solder Joints:** *Xiaoya Wang<sup>1</sup>; Mengting Han<sup>1</sup>; Limin Ma<sup>1</sup>; Guangchen Xu<sup>1</sup>; Fu Guo<sup>1</sup>; <sup>1</sup>Beijing University of Technology*

## 10:20 AM

**Finite Element Analysis of Current-Induced Thermal Stress in a Tin Ball:** *Ming Liu<sup>1</sup>; Fuqian Yang<sup>1</sup>; <sup>1</sup>University of Kentucky*

## 10:40 AM

**Mechanical Shock Behavior of Pb-Free Solders:** *Kyle Yazzie<sup>1</sup>; Huiyang Fei<sup>1</sup>; Hanqing Jiang<sup>1</sup>; Nikhilesh Chawla<sup>1</sup>; <sup>1</sup>Arizona State University*

## 11:00 AM

**Phase Segregation under Reversed Current Stressing in Eutectic Sn-Based Solder Joints:** *Sihan Liu<sup>1</sup>; Guangchen Xu<sup>1</sup>; Fu Guo<sup>1</sup>; Andre Lee<sup>2</sup>; K. N. Subramanian<sup>2</sup>; <sup>1</sup>Beijing University of Technology; <sup>2</sup>Michigan State University*

## 11:20 AM

**In-Situ Synchrotron Characterization of Reflow Behaviors, Crystal Orientation Evolution and Strain Development during Thermal Cycling in Lead-Free Solders:** *Bite Zhou<sup>1</sup>; Thomas Bieler<sup>1</sup>; Guilin Wu<sup>2</sup>; Stefan Zaefferer<sup>2</sup>; Tae-Kyu Lee<sup>3</sup>; Kuo-Chuan Liu<sup>3</sup>; <sup>1</sup>Michigan State University; <sup>2</sup>Max-Planck-Institut für Eisenforschung; <sup>3</sup>Cisco Systems, Inc*

## 11:40 AM

**Growth Mechanism of Sn Whiskers in a Vacuum and Air with Thermal Cycling:** *Jung-Lae Jo<sup>1</sup>; Keun-Soo Kim<sup>2</sup>; Katsuaki Suganuma<sup>1</sup>; <sup>1</sup>Osaka university; <sup>2</sup>Hoseo University*

## Perspectives for Emerging Materials Professionals: Early Strategies for Career Development: Session I

*Program Organizers:* Greg Oberson, U.S. Nuclear Regulatory Commission; Chirag Shah, Exova

Tuesday AM  
October 18, 2011

Room: B200/201  
Location: Columbus Con. Center

*Session Chairs:* Nitin Chopra, University of Alabama; Umesh Patil, Caterpillar Inc.

**8:00 AM Introductory Comments** Overview of ASM Emerging Professionals Committee

## 8:20 AM

**Emerging Professionals – A Canadian Perspective:** *Katherine Jonsson<sup>1</sup>; <sup>1</sup>University of Alberta*

## 8:40 AM

**Reflections and Recommendations of Emerging Between the Industrial and Federal Sectors:** *Jon Tirpak<sup>1</sup>; <sup>1</sup>FDMC*



**9:20 AM Break**

**9:40 AM**

**Emerging Technologies and Professional in Renewable Hydrogen Production by Solar Energy:** *Kaan Kalkan*<sup>1</sup>; <sup>1</sup>Oklahoma State University

**10:00 AM**

**Organic Photovoltaics: Present and Future Prospects:** *Sumit Chaudhary*<sup>1</sup>; Kanwar S. Nalwa<sup>1</sup>; Rakesh C. Mahadevapuram<sup>1</sup>; John Carr<sup>1</sup>; Yuqing Chen<sup>1</sup>; <sup>1</sup>Iowa State University

**10:20 AM**

**Solar Power Generation-A Sustainable Alternative Energy Technology:** *Ramana Reddy*<sup>1</sup>; <sup>1</sup>The University of Alabama

**10:40 AM**

**Technical Challenges Associated with the Deployment of CO<sub>2</sub> Capture and Conversion Materials:** *Christopher Matrangola*<sup>1</sup>; <sup>1</sup>US DOE- NETL

**11:00 AM Panel Discussion** Discussion of emerging professionals and energy materials research.

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**Phase Stability, Diffusion, Kinetics and their Applications (PSDK-VI): Session Honoring John W. Cahn, Recipient of ASM's 2011 J. Willard Gibbs Phase Equilibria Award**

*Program Organizers:* Jeffrey LaCombe, University of Nevada, Reno; Yongho Sohn, University of Central Florida; John Morral, Ohio State University; Ursula Kattner, National Institute of Standards and Technology; Abhijeet Misra, QuesTek Innovations LLC

Tuesday AM  
October 18, 2011

Room: C214  
Location: Columbus Con. Center

*Session Chairs:* Ursula Kattner, National Institute of Standards and Technology; John Morral, The Ohio State University

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**8:00 AM**

**Gibbs Lost, Found, Applied and Supplemented (Dedicated to the Memory of Francis Larché):** *John Cahn*<sup>1</sup>; <sup>1</sup>NIST and University of Washington

**8:40 AM Question and Answer Period**

**9:20 AM Break**

**9:40 AM**

**Thermodynamics of Interfaces: From Willard Gibbs to John Cahn to Recent Developments:** *Y. Mishin*<sup>1</sup>; <sup>1</sup>George Mason University

**10:20 AM**

**Surface Stress: A Materials Science Perspective:** *Jörg Weissmüller*<sup>1</sup>; <sup>1</sup>Technische Universität Hamburg-Harburg and Helmholtz-Zentrum Geesthacht

**11:00 AM**

**Coherent Precipitation in Ternary Al Alloys: Insights from First-Principles Modeling:** Colin Ophus<sup>1</sup>; Maarten de Jong<sup>2</sup>; Mark Asta<sup>2</sup>; Ulrich Dahmen<sup>1</sup>; Velimir Radmilovic<sup>1</sup>; <sup>1</sup>Lawrence Berkeley National Laboratory; <sup>2</sup>University of California, Berkeley

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**Professor K. K. Chawla Honorary Symposium on Fibers, Foams and Composites: Science and Engineering: Metal Matrix Composites/Ceramic Matrix Composites I**

*Program Organizers:* Nikhilesh Chawla, Arizona State University; Aldo Boccaccini, University of Erlangen-Nuremberg; Gary Gladysz, Trelleborg USA; Pedro D. Portella, Federal Institute of Testing and Materials BAM

Tuesday AM  
October 18, 2011

Room: D234  
Location: Columbus Con. Center

*Session Chairs:* Zhong-Chun Chen, Tottori University; Yu-Lin Shen, University of New Mexico

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**8:00 AM Invited**

**Plastic Deformation and Creep of Microcellular Metals: Theory and Experiment:** Etienne Combaz<sup>1</sup>; Sébastien Soubielle<sup>1</sup>; Randoald Mueller<sup>1</sup>; Yves Conde<sup>2</sup>; Frederic Diologent<sup>1</sup>; Russell Goodall<sup>1</sup>; *Andreas Mortensen*<sup>1</sup>; <sup>1</sup>Ecole Polytechnique Fédérale de Lausanne; <sup>2</sup>Swiss Federal Institute of Technology-Lausanne

**8:40 AM Invited**

**Prof. K. K. Chawla's Seminal Contributions to the Field of Metal Matrix Composites:** *Nikhilesh Chawla*<sup>1</sup>; <sup>1</sup>Arizona State University

**9:20 AM**

**Plastic Deformation Induced by Indentation Unloading: A Viscoplastic Analysis on Multilayered Composites:** *Yu-Lin Shen*<sup>1</sup>; <sup>1</sup>University of New Mexico

**9:40 AM Break**

**10:00 AM Invited**

**In-Situ X-Ray Studies of Ceramic Matrix Composites and Their Protective Coatings:** *Katherine Faber*<sup>1</sup>; Jonathan Almer<sup>2</sup>; Joaquin Ramirez-Rico<sup>1</sup>; Jules Routbort<sup>2</sup>; Dileep Singh<sup>2</sup>; Fabian Stolzenburg<sup>1</sup>; <sup>1</sup>Northwestern University; <sup>2</sup>Argonne National Laboratory

**10:40 AM Invited**

**In-Situ Synthesis, Microstructure, and Mechanical Properties of Alumina Matrix Composites:** *Zhong-Chun Chen*<sup>1</sup>; <sup>1</sup>Tottori University

**11:20 AM**

**Overview of Structure and Properties of Continuous Fiber Reinforced Mullite Composites:** *Angelique Neuman*<sup>1</sup>; Krishan Chawla<sup>2</sup>; <sup>1</sup>Los Alamos National Laboratory; <sup>2</sup>University of Alabama at Birmingham

**11:40 AM**

**Fiber Bridging Model for Reinforced-Carbon-Carbon:** *Kwai Chan*<sup>1</sup>; Yi-Der Lee<sup>1</sup>; Stephen Hudak<sup>1</sup>; <sup>1</sup>Southwest Research Institute

## Recent Advances in Structural Characterization of Materials: Tomographic and Imaging Methods

*Program Organizers:* Chad Parish, Oak Ridge National Laboratory; Roumiana Petrova, New Jersey Institute of Tech; Jacob Jones, University of Florida; Zhonghou Cai, Argonne National Laboratory; Gang Chen, Ohio University

Tuesday AM  
October 18, 2011

Room: C212  
Location: Columbus Con. Center

*Session Chair:* Gang Chen, Ohio University

### 8:00 AM Invited

**Recent Advances in APT Characterization of Nanoclusters and Nanovoids:** *Michael Miller*<sup>1</sup>; C. Parish<sup>1</sup>; P. Edmondson<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory

### 8:40 AM Invited

**Combining High-Energy X-Ray Tomography and Diffraction Techniques at the APS 1-ID Beamline:** *Peter Kenesei*<sup>1</sup>; Ulrich Lienert<sup>1</sup>; Jonathan Lind<sup>2</sup>; Christopher Hefferan<sup>2</sup>; Frankie Li<sup>2</sup>; Ali Khounsary<sup>1</sup>; Reeru Pokharel<sup>2</sup>; Robert Suter<sup>2</sup>; <sup>1</sup>Argonne National Laboratory; <sup>2</sup>Carnegie Mellon University

### 9:20 AM

**100 Hz Synchrotron Hard X-Ray Micro-Tomography:** *Wah-Keat Lee*<sup>1</sup>; Xianghui Xiao<sup>1</sup>; Kamel Fezzaa<sup>1</sup>; <sup>1</sup>Argonne National Laboratory

### 9:40 AM Break

### 10:00 AM Invited

**Deformation in FCC Copper, Experiment and Simulation:** *Jon Tischler*<sup>1</sup>; Ben Larson<sup>1</sup>; Anter El-Azab<sup>2</sup>; Mamdouh Mohamed<sup>2</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>The Florida State University

### 10:40 AM

**High-Energy X-Ray Tomography on 3D Microporous Composite Anode of Lithium-Ion Batteries:** *Xianghui Xiao*<sup>1</sup>; Fikile Brushett<sup>1</sup>; Susanna Neuhold<sup>1</sup>; Lynn Trahey<sup>1</sup>; John Vaughey<sup>1</sup>; <sup>1</sup>Argonne National Laboratory

### 11:00 AM

**Atom-Scale Characterization of the Chemistry and Structure of Material Transfer onto AFM Tips Resulting from Nanoscale Contact and Sliding Experiments:** Christopher Tourek<sup>1</sup>; Sriram Sundararajan<sup>1</sup>; <sup>1</sup>Iowa State University

## Shape Memory Alloys: Alloy Development and Behavior

*Program Organizer:* Mohammad Elahinia, University of Toledo

Tuesday AM  
October 18, 2011

Room: D242/243  
Location: Columbus Con. Center

*Session Chair:* Minal Bhadane, University of Toledo

### 8:00 AM

**In-Situ Synthesis of Shape Memory Alloy-Nitinol by Laser Direct Deposition and Its Property Characterization:** Pratik Halani<sup>1</sup>; Yung Shin<sup>1</sup>; <sup>1</sup>Purdue University

### 8:20 AM

**Modeling the Variation in Performance within Polycrystalline Shape Memory Alloys:** Harshad Paranjape<sup>1</sup>; Sivom Manchiraju<sup>1</sup>; Peter Anderson<sup>1</sup>; <sup>1</sup>The Ohio State University

### 8:40 AM

**Shape Memory Materials for Damage Detection in Metallic Materials:** Terry Wallace<sup>1</sup>; John Newman<sup>1</sup>; Stephen Smith<sup>1</sup>; William Leser<sup>2</sup>; Patrick Leser<sup>2</sup>; <sup>1</sup>NASA Langley Research Center; <sup>2</sup>North Carolina State University

### 9:00 AM

**Phase Field Modeling of P-Phase Precipitation in (Ni,Pt)Ti High Temperature Shape Memory Alloys:** Yipeng Gao<sup>1</sup>; Ning Zhou<sup>1</sup>; Fan Yang<sup>1</sup>; Ronald Noe<sup>2</sup>; Michael Mills<sup>1</sup>; Yunzhi Wang<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>NASA Glenn Research Center

### 9:20 AM

**Tension and Flex Bending Fatigue of Superelastic Nitinol:** John Lewandowski<sup>1</sup>; Brian Benini<sup>1</sup>; Melissa Young<sup>2</sup>; John Lewandowski<sup>1</sup>; <sup>1</sup>Case Western Reserve Univ; <sup>2</sup>Cleveland Clinic

### 9:40 AM Break

### 10:00 AM

**Investigating the Metamagnetic Shape Memory Behavior of NiMn-Based Alloys:** Haluk Karaca<sup>1</sup>; Burak Basaran<sup>1</sup>; Ali Turabi<sup>1</sup>; Peizhen Li<sup>1</sup>; Parth Parekh<sup>1</sup>; Bedri Baksan<sup>2</sup>; <sup>1</sup>UNIVERSITY OF KENTUCKY; <sup>2</sup>Eskisehir Osmangazi University

### 10:20 AM

**Transverse Load Capacity at Mid-Span of Heat-Treated Nitinol and Finite Element Predictions:** Walter Anderson<sup>1</sup>; Mohammad Elahinia<sup>1</sup>; Ahmadreza Eshghinejad<sup>1</sup>; <sup>1</sup>University of Toledo

### 10:40 AM

**Full-Field Mapping of Microstructural Evolution during Superelastic Deformation of SMAs:** Michael Kimiecik<sup>1</sup>; J. Jones<sup>1</sup>; Samantha Daly<sup>1</sup>; <sup>1</sup>University of Michigan

### 11:00 AM

**Effect of Strain Rate and Cycling in the Superelastic Deformation of the Shape Memory Alloy Nickel-Titanium:** Kyubum Kim<sup>1</sup>; Samantha Daly<sup>1</sup>; <sup>1</sup>The University of Michigan

## Steel Product Metallurgy and Applications: Advanced High Strength Steels II

*Program Organizer:* Bhaskar Yalamanchili, Gerdau Ameristeel.com

Tuesday AM  
October 18, 2011

Room: D132  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

### 8:00 AM

**Effect of Processing Parameters on Structure Evolution of Advanced High Strength Steels Containing Nb and Ti:** Rashmi Mohanty<sup>1</sup>; Hyun Jun<sup>1</sup>; Olga Girina<sup>1</sup>; Nina Fonstein<sup>1</sup>; Debanshu Bhattacharya<sup>1</sup>; Steve Jansto<sup>2</sup>; <sup>1</sup>ArcelorMittal; <sup>2</sup>Reference Metals Company

### 8:20 AM

**Strategies for Producing Dual Phase Steel Using Niobium Microalloying:** Hardy Mohrbacher<sup>1</sup>; <sup>1</sup>NiobelCon bvba

### 8:40 AM

**Effects of Cold Deformation and Annealing on Mechanical Properties, Microstructure and Precipitation State of a Ti-Nb AHSS:** Mehran Tehrani<sup>1</sup>; Farid Hassani<sup>2</sup>; <sup>1</sup>Virginia Polytechnic Institute and State University; <sup>2</sup>ArcelorMittal Global R&D

### 9:00 AM

**Investigations on Sheared Edge Damage of Dual Phase 780 Steel:** Constantin Chiriac<sup>1</sup>; Mike Shih<sup>1</sup>; <sup>1</sup>USS Corporation

9:20 AM

**Improvement of Hole Expansion Properties in Micro-Alloyed Dual Phase Steels:** *Jewoong Lee<sup>1</sup>; Seokjae Lee<sup>1</sup>; Bruno C. De Cooman<sup>1</sup>; <sup>1</sup>GIFT, POSTECH*

9:40 AM Break

10:00 AM

**Effect of Bainite on Mechanical Properties of Multiphase Ferrite-Bainite-Martensite Steels:** *Nina Fonstein<sup>1</sup>; Hyun Jo Jun<sup>1</sup>; Gang Huang<sup>1</sup>; Sriram Sadagopan<sup>1</sup>; Benda Yan<sup>1</sup>; <sup>1</sup>ArcelorMittal Global R&D - East Chicago*

10:20 AM

**Effects of Microstructures on the Mechanical Properties of DP980 Steels:** *Kyoo Sil Choi<sup>1</sup>; Ayoub Soulami<sup>1</sup>; Dongsheng Li<sup>1</sup>; Xin Sun<sup>1</sup>; <sup>1</sup>PNNL*

10:40 AM

**Effect of Initial Microstructure on Recrystallization and Austenite Formation:** *Mykola Kulakov<sup>1</sup>; Warren Poole<sup>1</sup>; Matthias Militzer<sup>1</sup>; <sup>1</sup>The Centre for Metallurgical Process Engineering, The University of British Columbia*

11:00 AM

**On the Multi-Phase Microstructure Design of a Low Alloy TRIP-Assisted Steel through Computational and Experimental Methodology:** *Ruixian Zhu<sup>1</sup>; Shengyen Li<sup>1</sup>; Ibrahim Karaman<sup>1</sup>; Raymundo Arroyave<sup>1</sup>; <sup>1</sup>Texas A&M University*

11:20 AM

**Quantitative Assessment of the Effect of Microstructure on the Stability of Retained Austenite in Multiphase TRIP Steels:** *Shenjia Zhang<sup>1</sup>; Kip Findley<sup>1</sup>; <sup>1</sup>Colorado School of Mines*

11:40 AM

**Development and Application of Hot Press Forming Steel by Quenching and Partitioning Process:** *Jinkeun Oh<sup>1</sup>; Yeolrae Cho<sup>1</sup>; Jai-Hyun Kwak<sup>1</sup>; <sup>1</sup>POSCO*

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## Surface Properties of Biomaterials: Biopolymers and Surface Modifications

**Program Organizers:** Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Thomas Webster, Brown University; Sharmila Mukhopadhyay, Wright State University; Paul Calvert, University of Massachusetts; Mukesh Kumar, Biomet Inc

Tuesday AM  
October 18, 2011

Room: C216  
Location: Columbus Con. Center

**Session Chairs:** Ketul Popat, Colorado State University; Gautam Gupta, Biomet, Inc.

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8:00 AM Invited

**Injectable Biomaterials for Tissue Regeneration and Drug Delivery:** *lakshmi Nair<sup>1</sup>; <sup>1</sup>University of Connecticut health Center*

8:40 AM Invited

**Electro-Conductive Polymeric Nanowire Templates Facilitates Neural Stem Cell Adhesion, Proliferation and Differentiation:** *Ketul Popat<sup>1</sup>; Samuel Bechara<sup>1</sup>; Lucas Wadman<sup>1</sup>; <sup>1</sup>Colorado State University*

9:20 AM Invited

**Using Ice to Make Nature Inspired Hybrid Materials:** *Antoni Tomsia<sup>1</sup>; Eduardo Saiz<sup>2</sup>; <sup>1</sup>Lawrence Berkeley Lab; <sup>2</sup>Imperial College London*

9:40 AM Break

10:00 AM

**BoneMaster™ HA Coating – An In Vivo Assessment:** *Gautam Gupta<sup>1</sup>; <sup>1</sup>Biomet, Inc.*

10:40 AM

**TiN Reinforced Ti6Al4V Alloy for Load-Bearing Implants:** *Vamsi Balla<sup>1</sup>; Abhimanyu Bhat<sup>1</sup>; Susmita Bose<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; <sup>1</sup>Washington State University*

11:00 AM Invited

**Structural Changes in Doped and Undoped Hydroxyapatite on Polarization and Its Influence on Bioactivity:** *Megen Velten<sup>1</sup>; Jharana Dhal<sup>2</sup>; Subhadip Bodhak<sup>2</sup>; Susmita Bose<sup>2</sup>; Amit Bandyopadhyay<sup>2</sup>; Pranesh Aswath<sup>1</sup>; <sup>1</sup>University of Texas at Arlington; <sup>2</sup>Washington State University*

11:20 AM

**Inhibition of Low-Temperature Degradation on Surface of Yttria-Stabilized Zirconia by Electric Polarization:** *Naohiro Horiuchi<sup>1</sup>; Norio Wada<sup>1</sup>; Miho Nakamura<sup>1</sup>; Akiko Nagai<sup>1</sup>; Kimihiro Yamashita<sup>1</sup>; <sup>1</sup>Tokyo Medical and Dental University*

11:40 AM

**Detonation Spraying of TiO<sub>2</sub>-Ag: Controlling the Phase Composition and Microstructure of the Coatings:** *Dina Dudina<sup>1</sup>; Sergey Zlobin<sup>2</sup>; Vladimir Ulianitsky<sup>2</sup>; Natalia Bulina<sup>1</sup>; Oleg Lomovsky<sup>1</sup>; <sup>1</sup>Institute of Solid State Chemistry and Mechanochemistry SB RAS; <sup>2</sup>Lavrentiev Institute of Hydrodynamics SB RAS*

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## Surface Protection for Enhanced Materials Performance: Science and Technology: Environmental Coatings

**Program Organizers:** Rodney Trice, Purdue University; Dongming Zhu, NASA Glenn Research Center; Daniel Mumm, University of California-Irvine; Hua-Tay Lin, Oak Ridge National Laboratory; Pravansu Mohanty, University of Michigan; Yutaka Kagawa, The University of Tokyo; Kang Lee, Rolls Royce; Charles Kay, ASB Industries, Inc.; Luc Pouliot, TECNAR Automation Ltd.

Tuesday AM  
October 18, 2011

Room: D230  
Location: Columbus Con. Center

**Session Chairs:** Dongming Zhu, NASA Glenn; Kang Lee, Rolls-Royce Corporation

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8:00 AM Invited

**Compositional Factors Affecting the Hot Corrosion of Advanced High-Temperature Coatings:** *Brian Gleeson<sup>1</sup>; <sup>1</sup>University of Pittsburgh*

8:40 AM

**Effect of Water Vapor on Non-Ideal Oxide Growth in NiAl-Based TBC Bond Coat Systems:** *Matthew Sullivan<sup>1</sup>; Daniel Mumm<sup>1</sup>; <sup>1</sup>University of California, Irvine*

9:00 AM

**High Temperature Oxidation Studies of NiCoCrAlY and NiCoCrAlY+Hf Bond Coats:** *Naresh Polasa<sup>1</sup>; Monica Silva<sup>1</sup>; Ravinder Diwan<sup>1</sup>; Patrick Mensah<sup>1</sup>; Stephen Akwaboa<sup>1</sup>; Shengmin Guo<sup>1</sup>; <sup>1</sup>Southern University and A & M College*

9:20 AM

**Effect of Aluminide Coating Application on the Creep Properties of Fe and Ni-Based Alloys:** *Sebastien Dryepondt<sup>1</sup>; Ying Zhang<sup>2</sup>; Bruce Pint<sup>1</sup>; <sup>1</sup>ornl; <sup>2</sup>TN Tech. Uni.*

9:40 AM Break

10:00 AM Invited

**Environmental Coatings For Gas Turbine Engine Applications:** *Ming Fu<sup>1</sup>; Roger Wustman<sup>1</sup>; Jeffrey Williams<sup>1</sup>; Douglas Konitzer<sup>1</sup>; <sup>1</sup>General Electric Aviation*

**10:40 AM Invited**

**Advanced Processing and Environmental Barrier Coating System Development for SiC/SiC Ceramic Matrix Composites:** *Dongming Zhu*<sup>1</sup>; Bryan Harder<sup>1</sup>; Dennis Fox<sup>1</sup>; <sup>1</sup>NASA Glenn Research Center

**11:20 AM**

**Electron Beam Surface Modification of Alloy 617 for High Temperature Oxidation Resistance:** *Injin Sah*<sup>1</sup>; Donghoon Kim<sup>1</sup>; Jahyun Koo<sup>1</sup>; Changheui Jang<sup>1</sup>; <sup>1</sup>KAIST

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## ACerS Edward Orton Jr. Memorial Lecture

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Tuesday PM  
October 18, 2011

Room: C113/114  
Location: Columbus Con. Center

**1:00 PM**

**Lessons Learned after 40 Years Sintering Technical Ceramics:** *Gary Messing*<sup>1</sup>; <sup>1</sup>The Pennsylvania State University

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## Additive Manufacturing of Metals: Ultrasonic and Other Solid State Additive Manufacturing

**Program Organizers:** Ian D. Harris, EWI; Ulf Ackelid, Arcam AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, Ohio State University; Brent Stucker, University of Louisville

Tuesday PM  
October 18, 2011

Room: D130  
Location: Columbus Con. Center

*Session Chair:* Brent Stucker, University of Louisville

**2:00 PM**

**Standards for the Additive Manufacturing Industry:** *Brent Stucker*<sup>1</sup>; <sup>1</sup>University of Louisville

**2:40 PM**

**Characterization of Microstructure in Al-3003 Alloy Builds Fabricated by Very High Power Ultrasonic Additive Manufacturing:** *Hiromichi Fujii*<sup>1</sup>; Sriraman Ramanujam<sup>2</sup>; Sudarsanam Babu<sup>2</sup>; <sup>1</sup>Tohoku University; <sup>2</sup>The Ohio State University

**3:00 PM**

**Dislocation Density Based Finite Element Modeling of Face Centered Cubic Materials Undergoing Ultrasonic Consolidation:** *Deepankar Pal*<sup>1</sup>; Brent Stucker<sup>1</sup>; <sup>1</sup>University of Louisville

**3:20 PM**

**Solid State Additive Manufacturing of Metals:** *Mark Norfolk*<sup>1</sup>; Matt Short<sup>1</sup>; <sup>1</sup>EWI

**3:40 PM Break**

**4:00 PM**

**Elastic Constants of Ultrasonic Additive Manufactured Al 3003-H18:** *Daniel Foster*<sup>1</sup>; Sudarsanam Babu<sup>1</sup>; Marcelo Dapino<sup>2</sup>; <sup>1</sup>Welding Engineering OSU; <sup>2</sup>Mechanical Engineering OSU

**4:20 PM**

**Thermal Stability of Al3003 Builds Made by Very High Power Ultrasonic Additive Manufacturing:** *Kittichai Sojiphan*<sup>1</sup>; Sudarsanam Babu<sup>1</sup>; <sup>1</sup>Ohio State University

**4:40 PM**

**Characterization of 304L Stainless Steel Builds Produced by Very High Power Ultrasonic Additive Manufacturing:** *Sriraman Ramanujam*<sup>1</sup>; Hiromichi Fujii<sup>1</sup>; Suresh Babu Sudarsanam<sup>1</sup>; Matt Short<sup>2</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>The Edison Welding Institute

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## Advanced Protective Coatings for Refractory Metals and Alloys: Oxidation Modeling, Synthesis and Performance of Alumina Stabilizing Coatings

**Program Organizers:** Ridwan Sakidja, University of Wisconsin-Madison; Brian Cockeram, Bechtel-Bettis

Tuesday PM  
October 18, 2011

Room: D231  
Location: Columbus Con. Center

*Funding support provided by:* WARF (Wisconsin Alumni Research Foundation)

*Session Chair:* Kyosuke Yoshimi, Tohoku University

**2:00 PM Invited**

**Multimillion Atom Molecular Dynamics Simulations of Reactive Nanosystems:** *Priya Vashishta*<sup>1</sup>; <sup>1</sup>University of Southern California

**2:40 PM**

**ReaxFF Reactive Force Field for Molecular Dynamics Simulations of Niobium Oxidation:** *De Nyago Tafeni*<sup>1</sup>; Adri Van Duin<sup>2</sup>; Michael Gao<sup>3</sup>; Jeffrey Hawk<sup>3</sup>; <sup>1</sup>National Energy Technology Lab - URS; <sup>2</sup>Penn State University; <sup>3</sup>National Energy Technology Lab

**3:00 PM Break**

**3:20 PM Invited**

**Synthesis and Performance of Platinum Group Metals Modified BNiAl Coatings for Enhanced Oxidation Stability of Mo-Based Alloys:** *Matthew Kramer*<sup>1</sup>; Mufit Akinci<sup>1</sup>; Kevin Severs<sup>1</sup>; Travis Brammer<sup>1</sup>; Pratik Ray<sup>1</sup>; <sup>1</sup>Iowa State University

**4:00 PM**

**Design and Synthesis of Al-Doped MoSiB Coatings:** *Ridwan Sakidja*<sup>1</sup>; Dylan Liebl<sup>1</sup>; John Perepezko<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

**4:20 PM**

**Formation of MoSi2 and Al Doped MoSi2 Coatings on Molybdenum Base TZM Alloy:** *Sanjib Majumdar*<sup>1</sup>; <sup>1</sup>Bhabha Atomic Research Centre

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## Advances in Dielectric Materials and Electronic Devices: Materials and Applications I

**Program Organizer:** K. M. Nair, E.I.duPont de Nemours & Co, Inc

Tuesday PM  
October 18, 2011

Room: C220  
Location: Columbus Con. Center

*Session Chairs:* V Mitic, University of Nis; R Guo, University of Texas@ San Antonio

**2:00 PM**

**BNT-Based Multilayer Device with Large and Temperature Independent Strain:** *Denis Schuetz*<sup>1</sup>; Werner Krauss<sup>1</sup>; Antonio Feteira<sup>2</sup>; Marco Deluca<sup>3</sup>; Klaus Reichmann<sup>1</sup>; <sup>1</sup>Graz university of Technology; <sup>2</sup>University of Birmingham; <sup>3</sup>University of Mining; Leoben

**2:20 PM**

**Development and Characterization of Metal-Oxide Thick Films for Gas Sensor Applications:** *Travis Busbee*<sup>1</sup>; <sup>1</sup>Ohio State University

2:40 PM

**Dielectric II-VI and IV-VI Metal Chalcogenide Thin Films in Silver Coated Hollow Glass Waveguides (HGWs) for Infrared Spectroscopy and Laser Delivery:** *Carlos Bledt*<sup>1</sup>; Daniel Kopp<sup>1</sup>; James Harrington<sup>1</sup>; <sup>1</sup>Rutgers, the State University of New Jersey

3:00 PM Break

3:20 PM

**Porosification of CaO-B<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> Glass Ceramics by Selective Etching for Super-Low k LTCC:** *Yi Tong Shi*<sup>1</sup>; Feng Yuan<sup>1</sup>; Jin E Mu<sup>1</sup>; Zhi Xin He<sup>2</sup>; Ji Hua Guo<sup>2</sup>; Yi Cao<sup>2</sup>; <sup>1</sup>Tianjin Polytechnic University; <sup>2</sup>Seven Stars Electronics Corporation

3:40 PM Invited

**Supercapacitor CCTO for High Energy Density Storage**<sup>^</sup>*x: R. Pandey*<sup>1</sup>; William Stapleton<sup>1</sup>; Jitendra Tate<sup>1</sup>; Anup Bandyopadhyay<sup>1</sup>; Priyantha Weeransinghe<sup>1</sup>; Soren Sprissler<sup>1</sup>; Ivan Sutanto<sup>1</sup>; Brandon Sammons<sup>1</sup>; Ravi Droopad<sup>1</sup>; Colin Wood<sup>1</sup>; <sup>1</sup>Texas State University

4:00 PM Invited

**(Bi, Sb)2(Te,S)3 System for Thermoelectric Applications:** *Winnie Wong-Ng*<sup>1</sup>; Qing Huang<sup>1</sup>; Joshua Martin<sup>1</sup>; Peter Zavalij<sup>2</sup>; Howard Jorress<sup>3</sup>; Yonggao Yan<sup>1</sup>; Azzam Mansour<sup>4</sup>; Evan Thomas<sup>5</sup>; Jihui Yang<sup>6</sup>; Martin Green<sup>1</sup>; <sup>1</sup>NIST; <sup>2</sup>University of Maryland; <sup>3</sup>Johns Hopkins University; <sup>4</sup>NSWC; <sup>5</sup>AFRL; <sup>6</sup>General Motors R&D

4:20 PM

**Interface Engineered Carbon Nanotube-Based Field Emission Devices:** *Indranil Lahiri*<sup>1</sup>; Wonbong Choi<sup>1</sup>; <sup>1</sup>Florida International University

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## Advances in Manufacturing Technologies: Machining, Joining and Issues

*Program Organizer:* Muammer Koc, Istanbul Sehir University

Tuesday PM  
October 18, 2011

Room: D144/145  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

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2:00 PM

**Direct Metal Laser Deposition of Austenitic Stainless Steel Structures: Processing and Characterization:** *Samar Kalita*<sup>1</sup>; <sup>1</sup>University of North Dakota

2:20 PM

**Influencing the Role of MnS Inclusions in Machining of Plain Carbon Steels:** *Kyle Watson*<sup>1</sup>; Andy Simoneau<sup>1</sup>; <sup>1</sup>University of New Brunswick

2:40 PM Cancelled

**Joining of Steel to Plastic by Using Fiber Laser and Plasma Arc Discharge:** *Varsha Maddela*<sup>1</sup>; Mehdi Asgharifard<sup>1</sup>; Radovan Kovacevic<sup>1</sup>; <sup>1</sup>Research Center for Advanced Manufacturing, Southern Methodist University

3:20 PM Break

3:40 PM

**Laser Machining of Alumina: Experimental and Numerical Approach for Surface Finish:** *Hitesh Vora*<sup>1</sup>; Sameer Paital<sup>1</sup>; Sandip Harimkar<sup>2</sup>; Sandra Boetcher<sup>1</sup>; Narendra Dahotre<sup>1</sup>; <sup>1</sup>University of North Texas; <sup>2</sup>Oklahoma State University

4:00 PM

**Linking Machining Parameters to the Silicon Phase in A356 Aluminum during Orthogonal Metal Cutting:** *Brad Cowperthwaite*<sup>1</sup>; Andy Simoneau<sup>1</sup>; <sup>1</sup>University of New Brunswick

4:20 PM Cancelled

**Nanostructured AlTiSiN Coatings For Ball Helical Milling Application Of Austempered Ductile Irons (ADI):** *David Olvera*<sup>1</sup>; Luis Norberto López de Lacalle<sup>1</sup>; Asier Fernandez<sup>1</sup>; Javier Fernandez de Larrinoa<sup>2</sup>; Ibon Azkona<sup>2</sup>; <sup>1</sup>University of the Basque Country UPV/EHU; <sup>2</sup>Metal Estalki

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## ASM Edward DeMille Campbell Memorial Lecture

Tuesday PM  
October 18, 2011

Room: D131  
Location: Columbus Con. Center

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12:45 PM

**The Roles of Determinism and Noise in Dendritic Growth:** *Martin Glicksman*<sup>1</sup>; <sup>1</sup>University of Florida

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## Ceramic Matrix Composites: Foreign Object Damage

*Program Organizers:* Narottam Bansal, NASA Glenn Research Center; J. P. Singh, U.S. Army Research Laboratory; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Tuesday PM  
October 18, 2011

Room: C112  
Location: Columbus Con. Center

*Session Chair:* Sung Choi, Naval Air Systems Command

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2:00 PM Invited

**Overview of Foreign Object Damage (FOD) in CMCs and Coatings:** *Sung Choi*<sup>1</sup>; <sup>1</sup>Naval Air Systems Command

2:40 PM Invited

**Impact and Erosion Resistance of Novel Thermal/Environmental Barrier Coating Systems:** *Derek Hass*<sup>1</sup>; Susie Eustis<sup>1</sup>; Balvinder Gogia<sup>1</sup>; <sup>1</sup>DVTI

3:20 PM Invited

**Analysis and Modeling of Foreign Object Damage (FOD) in Ceramic Matrix Composites:** *William Troha*<sup>1</sup>; Frank Abdi<sup>1</sup>; <sup>1</sup>AlphaSTAR Corporation

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## Characterization and Modeling of the Performance of Advanced Alloys for the Transportation Industry -- Bridging the Data Gap II: Predicting the Mechanical Behavior of Advanced Lightweight Alloys

*Program Organizers:* Mark Stoudt, National Institute of Standards and Technology; Adam Creuziger, National Institute of Standards and Technology; John Carsley, General Motors; Michael Miles, BYU; Kip Findley, Colorado School of Mines

Tuesday PM  
October 18, 2011

Room: D131  
Location: Columbus Con. Center

*Session Chair:* Kip Findley, Colorado School of Mines

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2:00 PM Invited

**Material Property Data for Effective Numerical Modeling of Sheet Forming Processes:** *Chester Van Tyne*<sup>1</sup>; Bernard Levy<sup>2</sup>; <sup>1</sup>Colorado School of Mines; <sup>2</sup>BS Levy Consultants

Tuesday PM



2:40 PM

**Tools for Assessing Information-Based Design and Identifying Information Gaps in Magnesium Alloy Repositories:** *Kim Ferris<sup>1</sup>*; Dumont Jones<sup>2</sup>; <sup>1</sup>Pacific Northwest National Laboratory; <sup>2</sup>Proximate Technologies, LLC

3:00 PM Break

3:20 PM

**Quantifying the Relationship between Deformation-Induced Surface Roughness, Strain Localization, and Grain Orientation in Polycrystalline Aluminum Sheet:** *Mark Stoudt<sup>1</sup>*; Joseph Hubbard<sup>1</sup>; Adam Creuziger<sup>1</sup>; Lyle Levine<sup>1</sup>; <sup>1</sup>National Institute of Standards and Technology

3:40 PM

**A Method of Measuring Strain-Rate Sensitivity Changes during Elevated Temperature Deformation of Sheet Alloys:** *Ravi Verma<sup>1</sup>*; <sup>1</sup>General Motors

4:00 PM

**Development of a MEMS-Based Micro-Tensile Technique to Assess Micromechanical and Large-Scale Mechanical Behavior:** *Whitney Poling<sup>1</sup>*; Nicholas Barbosa<sup>2</sup>; Kip Findley<sup>1</sup>; David Read<sup>2</sup>; Li-Anne Liew<sup>2</sup>; <sup>1</sup>Colorado School of Mines; <sup>2</sup>National Institute of Standards and Technology

## Controlled Synthesis, Processing and Applications of Structural and Functional Nanomaterials: One Dimensional Nanomaterials II

**Program Organizers:** Kathy Lu, Virginia Tech; Xudong Wang, University of Wisconsin - Madison; Eugene Olevsky, San Diego State University; Gurpreet Singh, Kansas State University; Nitin Chopra, The University of Alabama; Pu-Xian Gao, University of Connecticut; Jianyu Liang, Worcester Polytechnic Institute

Tuesday PM

October 18, 2011

Room: C123

Location: Columbus Con. Center

*Session Chair:* Nitin Chopra, University of Alabama

2:00 PM Invited

**Surface-Directed Growth of ZnO Nanowires for Planar Formation of n-p Heterojunction Arrays and Nanodevices:** *Babak Nikoobakht<sup>1</sup>*; <sup>1</sup>National Institute of Standards and Technology

2:40 PM

**ZnO Nanowire Arrays Coated With  $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$  Perovskite Nanoparticles for DOC and DeNO<sub>x</sub> Integration:** *Sarah Glod<sup>1</sup>*; Zhonghua Zhang<sup>1</sup>; Yanbing Guo<sup>1</sup>; Pu-Xian Gao<sup>1</sup>; <sup>1</sup>University of Connecticut

3:00 PM Break

3:20 PM Invited

**Synthesis, Properties and Photovoltaic - Photonic Fuels Application of Self-Assembled 1-D TiO<sub>2</sub> Nanotube/wire Arrays:** *Craig Grimes<sup>1</sup>*; <sup>1</sup>Photonic Fuels

4:00 PM

**Preparation of a Mass Quantities Silver Nanowires with Controllable Diameter:** *Qunyan Wei<sup>1</sup>*; DePeng Zhao<sup>1</sup>; Xiangjun Yang<sup>1</sup>; Hong Guo<sup>1</sup>; <sup>1</sup>Yunnan university

## Deformation and Transitions at Grain Boundaries: Anisotropy Effects on Grain Boundaries

**Program Organizers:** Thomas Bieler, Michigan State University; Douglas Spearot, University of Arkansas; Rozaliya Barabash, Oak Ridge National Laboratory; Shen Dillon, University of Illinois at Urbana-Champaign; Jian Luo, Clemson University

Tuesday PM

October 18, 2011

Room: C121

Location: Columbus Con. Center

*Session Chairs:* Hao Zhang, University of Alberta; David Rowenhorst, Naval Research Lab

2:00 PM Invited

**Creep Damage Dependence on Grain Boundary Character in Ferritic-Martensitic Steels:** *David Field<sup>1</sup>*; Zhe Leng<sup>1</sup>; <sup>1</sup>Washington State University

2:20 PM Invited

**Influence of Grain Boundary Crystallography on the Nucleation Characteristics of Dynamic Failure:** *Mukul Kumar<sup>1</sup>*; Roger Minich<sup>1</sup>; <sup>1</sup>Lawrence Livermore National Laboratory

2:40 PM Invited

**Crystallographic Anisotropies in Grain Boundary Interface Curvature:** *David Rowenhorst<sup>1</sup>*; Alexis Lewis<sup>1</sup>; <sup>1</sup>The US Naval Research Laboratory

3:00 PM Break

3:20 PM

**The Role of Grain Boundary Structure during Shock Loading:** *Ellen Cerreta<sup>1</sup>*; Alex Perez-Bergquist<sup>1</sup>; Juan-Pablo Escobedo-Diaz<sup>1</sup>; Carl Trujillo<sup>1</sup>; George Gray<sup>1</sup>; Saryu Fensin<sup>1</sup>; Steven Valone<sup>1</sup>; Christian Brandl<sup>1</sup>; Timothy Germann<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

3:40 PM

**Development of Grain Boundaries during Solidification of Anisotropic Materials:** *Om Singh<sup>1</sup>*; <sup>1</sup>K. N. Post Graduate College

4:00 PM Invited

**Grain Boundary Sliding in FCC and HCP Metals:** *Hao Zhang<sup>1</sup>*; <sup>1</sup>University of Alberta

## Emerging Frontiers in Surface Engineering of Biomaterials : Biocoatings and Surface Protection

**Program Organizers:** Kantesh Balani, Indian Institute of Technology Kanpur; Arvind Agarwal, Florida International University; Sandip Harimkar, Oklahoma State University; Winston Soboyejo, Princeton University

Tuesday PM

October 18, 2011

Room: C226

Location: Columbus Con. Center

*Session Chairs:* Sandip Harimkar, Oklahoma State University; Kantesh Balani, Indian Institute of Technology Kanpur

2:00 PM

**Polyvinyl Alcohol-HA Hydrogels Surface Modification through Octacalcium Phosphate by a Biomimetic Route:** *Avijit Guha<sup>1</sup>*; Suprabha Nayyar<sup>1</sup>; <sup>1</sup>National Metallurgical Laboratory

2:20 PM

**Thermomechanical Properties of Polyimide-Based Block Copolymers Containing Ladder-like Polysilsequioxanes:** *Linqian Feng<sup>1</sup>*; Jude Iorh<sup>1</sup>; <sup>1</sup>the University of Cincinnati



2:40 PM

**Synthesis of Electrophoretic ZnO Coatings on Titanium:** Shankar Chandra Prakash<sup>1</sup>; Abbas Ashik<sup>1</sup>; Parameswaran Prabhu<sup>1</sup>; R. Subramanian<sup>1</sup>; Ramaswamy Narayanan<sup>1</sup>; <sup>1</sup>PSG College of Technology

3:00 PM Break

3:20 PM Cancelled

**Coating a Large Variety of Surfaces by the Sonochemical Methods: Anti Bacterial, Anti Viral, Anti Biofilms and Antifungal Coatings on Textiles and Glasses:** Aharon Gedanken<sup>1</sup>; <sup>1</sup>Bar-Ilan University

3:40 PM Concluding Comments

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## Energy Conversion/Fuel Cells: Electrolyte Materials

*Program Organizers:* Matthew Seabaugh, NexTech Materials, Ltd.; Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Meilin Liu, Georgia Institute of Technology

Tuesday PM  
October 18, 2011

Room: C224  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

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2:00 PM

**Electronic Transport and Thermodynamic Properties of ZrO<sub>2</sub>-Y<sub>2</sub>O<sub>3</sub>-MnO<sub>x</sub> Solid Solutions:** Manoj Mahapatra<sup>1</sup>; Atul Verma<sup>1</sup>; Prabhakar Singh<sup>1</sup>; <sup>1</sup>University of Connecticut

2:40 PM

**Degradation Mechanism of SOFC Cathode Electrolyte Systems Incorporating Doped Lanthanum Gallates:** Chuan Zhang<sup>1</sup>; Anh Duong<sup>1</sup>; Daniel Mumm<sup>1</sup>; <sup>1</sup>University of California, Irvine

3:00 PM Break

3:20 PM

**Size Dependent Transport Properties in Nanocrystalline Ceria Membranes:** Kyle Brinkman<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory (SRNL)

4:00 PM

**Electrical Properties and Sintering Characteristics of Bi-Doped Gd<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> Powders:** Jose Diaz-Guillen<sup>1</sup>; Esmeralda Mendoza-Mendoza<sup>2</sup>; Antonio Fuentes<sup>2</sup>; <sup>1</sup>Instituto Tecnológico de Saltillo; <sup>2</sup>Cinvestav del IPN

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## Energy Storage: Materials, Systems and Applications: Flow, Li-Air, and Other Batteries

*Program Organizers:* Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Terry Holesinger, Los Alamos National Laboratory; Xingbo Liu, West Virginia University; Chun Lu, Siemens Energy, Inc.

Tuesday PM  
October 18, 2011

Room: C223  
Location: Columbus Con. Center

*Session Chairs:* Wei Wang, Pacific Northwest National Laboratory; Hui Zhang, West Virginia University

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2:00 PM Invited

**Advanced Vanadium Redox Flow Batteries with Mixed Acid Supporting Electrolyte:** Soowhan Kim<sup>1</sup>; Liyu Li<sup>1</sup>; Wei Wang<sup>1</sup>; Baowei Chen<sup>1</sup>; Murugesan Vijayakumar<sup>1</sup>; Birgit Schwenzer<sup>1</sup>; Zimin Nie<sup>1</sup>; Zhenguo Yang<sup>1</sup>; <sup>1</sup>Pacific Northwest National Laboratory

2:40 PM Invited

**Progress on Technology of Redox Flow Battery and Its Application in China:** Huamin Zhang<sup>1</sup>; <sup>1</sup>Dalian Institute of Chemical Physics, Chinese Academy of Sciences

3:20 PM Break

4:00 PM

**A New Redox Flow Battery Using Fe/V Redox Couples in Chloride Supporting Electrolyte:** Wei Wang<sup>1</sup>; Soowhan Kim<sup>2</sup>; Baowei Chen<sup>2</sup>; Zimin Nie<sup>2</sup>; Jianlu Zhang<sup>2</sup>; Guan-Guang Xia<sup>2</sup>; Liyu Li<sup>2</sup>; Zhenguo Yang<sup>2</sup>; <sup>1</sup>Pacific Northwest National Laboratory; <sup>2</sup>Pacific Northwest National Laboratory

4:20 PM

**Powder X-Ray Diffraction Investigation of Cathodic Material in Spent Alkaline Batteries from a Waste Stream in Butler County, Ohio:** Chris Burnette<sup>1</sup>; Heather Barrett<sup>1</sup>; Alyssa Ferraro<sup>1</sup>; Amanda Meyer<sup>1</sup>; Mark Krekeler<sup>1</sup>; <sup>1</sup>Miami University, Oxford Ohio

4:40 PM

**Investigation on Rechargeability of Lithium/Air Batteries:** Ming Au<sup>1</sup>; Elise Fox<sup>1</sup>; Hector-Colon Mercado<sup>1</sup>; Thad Adams<sup>1</sup>; Guoqing Zhang<sup>2</sup>; Jim Zheng<sup>2</sup>; <sup>1</sup>Savannah River National Laboratory; <sup>2</sup>Florida State University

5:00 PM

**Polyhydration of Multicomponent Energy Storage Systems:** Vasily Lutsyk<sup>1</sup>; <sup>1</sup>Buryat State University

5:20 PM

**Preliminary Heavy Metal Survey of a Spent Alkaline Battery Waste Stream from Butler County, Ohio: Source and Environmental Implications:** Heather Barrett<sup>1</sup>; Chris Burnette<sup>1</sup>; Amanda Meyer<sup>1</sup>; Alyssa Ferraro<sup>1</sup>; Mark Krekeler<sup>1</sup>; <sup>1</sup>Miami University, Oxford Ohio

5:40 PM Cancelled

**Hierarchically Porous Graphene as a Lithium-Air Battery Electrode:** Jie Xiao<sup>1</sup>; Donghai Mei<sup>1</sup>; Xiaolin Li<sup>1</sup>; Wu Xu<sup>1</sup>; Gordon Graff<sup>3</sup>; Wendy Bennett<sup>1</sup>; Zimin Nie<sup>1</sup>; Laxmikant Saraf<sup>1</sup>; Ilhan Aksay<sup>1</sup>; Jun Liu<sup>1</sup>; Jason Zhang<sup>1</sup>; <sup>1</sup>Pacific Northwest National Laboratory

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## Environmentally Assisted Cracking of Materials: Session III

*Program Organizers:* Ramgopal Thodla, DNV Columbus; Suresh Divi, TIMET

Tuesday PM  
October 18, 2011

Room: D233  
Location: Columbus Con. Center

*Session Chair:* Suresh Divi, TIMET

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2:00 PM

**Identification of Hydrogen Trapping Sites, Binding Energies, and Occupation Ratios at Vacancy, Dislocation and Grain Boundary in Iron Including Various Carbon Contents:** Naruaki Abe<sup>1</sup>; Hiroshi Suzuki<sup>1</sup>; Kenichi Takai<sup>1</sup>; Nobuyuki Ishikawa<sup>2</sup>; Hitoshi Sueyoshi<sup>2</sup>; <sup>1</sup>Sophia University; <sup>2</sup>JFE Steel Corporation

2:20 PM

**In-Situ Repairs of Oil Industry Pipelines, Tanks and Vessels by Welding Using Metal Arc Welding Under Oil (MAW-UO):** Hamad Almostaneer<sup>1</sup>; Stephen Liu<sup>1</sup>; David Olson<sup>1</sup>; <sup>1</sup>Colorado School of Mines

2:40 PM

**Inter-Granular Corrosion Susceptibility of Cast Stainless Steels:** Deepak Kumar<sup>1</sup>; Sebastien Dryepondt<sup>1</sup>; Bruce Pint<sup>1</sup>; Edgar Lara-Curzio<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory

## 3:00 PM Break

### 3:20 PM

**Metallurgical Analysis to Evaluate Cracking in a 316L Grade Stainless Steel Spiral Heat Exchanger:** *Thomas Traubert<sup>1</sup>; Tim Jur<sup>1</sup>; <sup>1</sup>Engineering Design & Testing*

### 3:40 PM

**Stress Corrosion Cracking of Steel In Concentrated Nitrate Environments:** *Sean Brossia<sup>1</sup>; Feng Gui<sup>1</sup>; John Beavers<sup>1</sup>; Hongbo Cong<sup>1</sup>; <sup>1</sup>DNV*

### 4:00 PM

**Reduction of Delayed Fracture Susceptibility through Increased Si Content and Surface-softening of Tempered Martensitic Steel:** *Yu Matsumoto<sup>1</sup>; Kenichi Takai<sup>1</sup>; Mikiyuki Ichiba<sup>2</sup>; Shigeru Mizoguchi<sup>3</sup>; Tsukasa Okamura<sup>3</sup>; <sup>1</sup>Sophia University; <sup>2</sup>Tokyo Electric Power Company; <sup>3</sup>Neturen, Co., Ltd*

### 4:20 PM

**Weld Joint Failures of a Water Cooling Jacket:** *Fahmida Hossain<sup>1</sup>; Veda-Anne Ulcickas<sup>1</sup>; <sup>1</sup>Massachusetts Materials Research, Inc.*

### 4:40 PM

**Stress Corrosion Cracking of Brass: A Comparative Study on Accelerated Laboratory Testing:** *Helena Chiang<sup>1</sup>; Carl Wang<sup>1</sup>; Edgar Wolff-Klammer<sup>2</sup>; <sup>1</sup>Underwriters Laboratories Taiwan Co., Ltd.; <sup>2</sup>Underwriters Laboratories, Inc.*

## Failure Analysis and Prevention: Fasteners

**Program Organizers:** Andrew Spowage, The University of Nottingham, Malaysia Campus; Tom Ackerson, IMR Metallurgical Services; Larry Hanke, Materials Evaluation and Engineering, Inc

Tuesday PM  
October 18, 2011

Room: D235  
Location: Columbus Con. Center

**Session Chairs:** Tim Jur, Engineering Design and Testing Corp.; Michael Connelly, Casey Products; Roch Shipley, Professional Analysis and Consulting, Inc.

### 2:00 PM

**Fatigue Failure Analysis of Extrusion Press Tie Rods:** *Kyle Minden<sup>1</sup>; <sup>1</sup>Engineering Design & Testing Corp.*

### 2:20 PM

**Failure of a Surgical Rod:** *Tongguang Zhai<sup>1</sup>; Wei Wen<sup>1</sup>; <sup>1</sup>University of Kentucky*

### 2:40 PM

**Failure Analysis of A Tractor Suspension U-Bolt:** *Michael Connelly<sup>1</sup>; <sup>1</sup>Casey Products*

## 3:00 PM Break

### 3:20 PM

**Failure Analysis of Blind Rivet in Automotive Application:** *YanJun Huang<sup>1</sup>; <sup>1</sup>Key Safety Systems, Inc.*

### 3:40 PM

**A Study of a Separation of a Bolted Drive Shaft Coupling:** *Tim Jur<sup>1</sup>; Ronald Windham<sup>1</sup>; <sup>1</sup>Engineering Design & Testing Corp*

### 4:00 PM

**Fastener Failure Mode Effects Analysis – A Microstructural Approach:** *Michael Connelly<sup>1</sup>; Frauke Hogue<sup>2</sup>; <sup>1</sup>Casey Products; <sup>2</sup>Hogue Metallography*

## Fatigue and Microstructure: A Symposium on Recent Advances: Dual-Mode Fatigue

**Program Organizers:** Amit Shyam, Oak Ridge National Laboratory; Sushant Jha, Air Force Research Laboratory/Universal Technology Corporation; Michael Caton, US Air Force Research Laboratory

Tuesday PM  
October 18, 2011

Room: D240/241  
Location: Columbus Con. Center

**Session Chair:** Sushant Jha, Air Force Research Laboratory/Universal Technology Corporation

### 2:00 PM

**Reducing Uncertainty for Fatigue Life Limits of Turbine Engine Alloys:** *James Larsen<sup>1</sup>; Sushant Jha<sup>2</sup>; Michael Caton<sup>1</sup>; Reji John<sup>1</sup>; Andrew Rosenberger<sup>1</sup>; Dennis Buchanan<sup>3</sup>; Christopher Szczepanski<sup>1</sup>; Patrick Golden<sup>1</sup>; <sup>1</sup>Air Force Research Laboratory; <sup>2</sup>Universal Technology Corp.; <sup>3</sup>University of Dayton Research Institute*

### 2:40 PM

**The Fatigue Behavior of High Strength Tool Steel Materials:** *Amit Shyam<sup>1</sup>; Peter Blau<sup>1</sup>; Tyson Jordon<sup>1</sup>; Nan Yang<sup>2</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>Caterpillar Inc.*

## 3:00 PM Break

### 3:20 PM

**The Complexity of Fatigue Behavior as Determined by Competing Failure Mechanisms in Metallic Materials:** *K. S. Ravi Chandran<sup>1</sup>; <sup>1</sup>University of Utah*

### 4:00 PM

**Probabilistic Prediction of Minimum Fatigue Life of a Shot Peened Titanium Alloy:** *Reji John<sup>1</sup>; Sushant Jha<sup>2</sup>; James Larsen<sup>1</sup>; <sup>1</sup>Air Force Research Laboratory; <sup>2</sup>Universal Technology Corporation*

## Glass and Optical Materials: Glass Modeling and Simulation I

**Program Organizer:** Pierre Lucas, University of Arizona

Tuesday PM  
October 18, 2011

Room: C111  
Location: Columbus Con. Center

**Session Chair:** To be announced

### 2:00 PM

**Elucidating the Structure and Properties of Glasses: Contributions from Recent Computer Simulations:** *Jincheng Du<sup>1</sup>; <sup>1</sup>University of North Texas*

### 2:40 PM

**Temperature Dependence on Borosilicate Glass Structure: A Complementary Approach from NMR and High-Temperature Raman:** *Frédéric Angeli<sup>1</sup>; Olivier Villain<sup>1</sup>; Dominique de Ligny<sup>2</sup>; Thibault Charpentier<sup>1</sup>; <sup>1</sup>CEA; <sup>2</sup>Université Claude Bernard Lyon 1*

## 3:00 PM Break

### 3:20 PM

**Understanding the Structure and Properties of Intermediate Glasses using Computer Simulations:** *Liping Huang<sup>1</sup>; <sup>1</sup>Rensselaer Polytechnic Institute*

### 4:00 PM

**Simulation of Local Structure and Energies of Fe<sup>3+</sup> and Fe<sup>2+</sup> in Alkaline Earth Silicate Glasses:** *HiroYuki Inoue<sup>1</sup>; Atsunobu Masuno<sup>1</sup>; <sup>1</sup>Institute of Industrial Science, The University of Tokyo*

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## Green Technologies for Materials Manufacturing and Processing III: Green Manufacturing II

**Program Organizers:** Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST); Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center; Richard Sisson, Worcester Polytechnic Institute, Center for Heat Treating Excellence; Makio Naito, Osaka University

Tuesday PM                      Room: D232  
October 18, 2011              Location: Columbus Con. Center

**Session Chairs:** Junichi Tatami, Yokohama National University; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST)

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### 2:00 PM

**Green Technologies Enhanced by Recent Advances in Fundamental Physics:** *Juliana Mortenson*<sup>1</sup>; <sup>1</sup>General Resonance, LLC

### 2:20 PM Invited

**Hot Gas Cleaning with Gas-Solid Reactions and Related Materials for Advanced Clean Power Generation from Coal:** *Hiromi Shirai*<sup>1</sup>; Hisao Makino<sup>1</sup>; <sup>1</sup>Central Research Institute of Electric Power Industry

### 2:40 PM

**Fuel Use Reduction and Lower Emissions Using Rugged, Verifiable, In-Situ Oxygen Analyzers for Combustion Optimization in High-Temperature Processing for Metals, Ceramics, Process Chemical and Incineration:** *Yvonne Boltz*<sup>1</sup>; Eric Boltz<sup>1</sup>; Justin Clark<sup>1</sup>; <sup>1</sup>Marathon Monitors Inc, Group UPC

### 3:00 PM Break

### 3:20 PM

**Modern Approaches and CFD Simulation in the Green Ventilation of Process Buildings:** *Edmund Baltuch*<sup>1</sup>; <sup>1</sup>Air-Therm Inc.

### 3:40 PM

**Intelligent Energy Control System in Hot Strip Mill:** *Hiroyuki Imanari*<sup>1</sup>; <sup>1</sup>Toshiba Mitsubishi-Electric Industrial Systems Corporation

### 4:00 PM

**Application of the Intelligent Strip Running Deviation Monitoring System in Continuous Annealing Line of Automotive Sheet:** *HE JIANFENG*<sup>1</sup>; <sup>1</sup>Baosteel/Nipponsteel/Arcelel Automotive Steel sheets Co.LTD.

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## Hardness across the Multi-Scales of Structure and Loading Rate: Loading Rate Aspects

**Program Organizers:** Ronald Armstrong, University of Maryland; David Bahr, Washington State University; Naresh Thadhani, Georgia Institute of Technology; Stephen Walley, Physics and Chemistry of Solids Cavendish Laboratory

Tuesday PM                      Room: C210  
October 18, 2011              Location: Columbus Con. Center

**Session Chairs:** Naresh Thadhani, Georgia Institute of Technology ; Christopher Schuh, Massachusetts Institute of Technology

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### 2:00 PM Invited

**Impression and Indentation Creep and Stress Relaxation:** *James Li*<sup>1</sup>; <sup>1</sup>University of Rochester

### 2:20 PM Invited

**Investigation of the Fatigue Characteristic of the Flat Cylindrical Indenter Test:** *Zhufeng Yue*<sup>1</sup>; shifeng wen<sup>1</sup>; <sup>1</sup>Department of Engineering Mechanics, Northwestern Polytechnical University

### 2:40 PM Invited

**Creep Influence on Hardness in Multi-Scale Contact:** *Andreas Goedecke*<sup>1</sup>; Randolph Mock<sup>1</sup>; <sup>1</sup>Siemens Corporate Technology

### 3:00 PM Break

### 3:20 PM Invited

**Understanding the Dynamic Indentation Behaviour of Metallic Materials:** *Sundararajan G*<sup>1</sup>; <sup>1</sup>ARCI

### 3:40 PM Invited

**Correlating Impact-Related Residual Microstructures through 2D Computer Simulations and Microindentation Hardness Mapping: A Review:** *L. Murr*<sup>1</sup>; <sup>1</sup>University of Texas at El Paso

### 4:00 PM

**Relationship between Static and Dynamic Indentation Response and Impact-Induced Damage in Transparent Materials:** *Ghatu Subhash*<sup>1</sup>; <sup>1</sup>University of Florida

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## Innovative Processing and Synthesis of Ceramics, Glasses and Composites: CVD, Plasma Spray, Inkjet and Laser Processing

**Program Organizers:** J. P. Singh, U.S. Army Research Laboratory; Narottam Bansal, NASA Glenn Research Center; Takashi Goto, Tohoku University

Tuesday PM                      Room: C110  
October 18, 2011              Location: Columbus Con. Center

**Session Chair:** Sanjay Mathur, University of Cologne

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### 2:00 PM Invited

**Plasma-Enhanced CVD of Metal Oxide Nanostructures: Growth and Device Applications:** *Aadesh Singh*<sup>1</sup>; Thomas Rügamer<sup>1</sup>; Sanjay Mathur<sup>1</sup>; Nürgül Tosun<sup>1</sup>; Andreas Mettenboerger<sup>1</sup>; <sup>1</sup>University of Cologne

### 2:40 PM

**Improved Plasma Spray Solution Precursors By Careful Choice of Precursor Chemistry/Properties and by Use of Suspensions:** *Eric Jorddan*<sup>1</sup>; Maurice Gell<sup>2</sup>; Jacqueline Garofano<sup>2</sup>; Jiang Chen<sup>2</sup>; Chigozie Muoto<sup>2</sup>; <sup>1</sup>Univeristy of Connecticut ; <sup>2</sup>Univeristy of Connecticut

### 3:00 PM Break

### 3:20 PM

**Inkjet Printing Approach to Fabrication of Non-Sintered Ceramic-Polymer Hybrid Films and Their Application to 3D System Integration:** *Jonghee Kim*<sup>1</sup>; Jihoon Kim<sup>1</sup>; Youngjoon Yoon<sup>1</sup>; Hyotae Kim<sup>1</sup>; <sup>1</sup>Korea Institute of Ceramic Engineering and Technology

### 3:40 PM

**Laser Direct Synthesis of Metal Matrix Composites:** *Kevin Schoeffel*<sup>1</sup>; Yung Shin<sup>1</sup>; <sup>1</sup>Purdue University

### 4:00 PM

**Laser Densification of Porous ZrB<sub>2</sub>-SiC Composites:** *Quentin Lonné*<sup>1</sup>; Nicolas Glandut<sup>1</sup>; Pierre Lefort<sup>1</sup>; <sup>1</sup>University of Limoges

## Integrated Computational Materials Engineering: Modeling and Simulation Applied to Metals Processing: Modeling and Simulation of Casting Processes and Associated Microstructure Evolution

Program Organizer: David Furrer, Pratt & Whitney

Tuesday PM Room: C213  
October 18, 2011 Location: Columbus Con. Center

Session Chair: Rajiv Mishra, Missouri University of Science and Technology

### 2:00 PM

**Solidification Microstructure Characteristics: Benchmark Data Generated by In Situ Synchrotron X-Ray Imaging in Processing of Metallic Alloys:** *Bernard Billia*<sup>1</sup>; Henri Nguyen-Thi<sup>2</sup>; Nathalie Mangelinck-Noel<sup>1</sup>; Guillaume Reinhart<sup>2</sup>; Nathalie Bergeon<sup>2</sup>; Aziz Bogno<sup>2</sup>; Adeline Buffet<sup>3</sup>; Jose Baruchel<sup>3</sup>; Thomas Schenk<sup>1</sup>; <sup>1</sup>CNRS; <sup>2</sup>Aix-Marseille Universite; <sup>3</sup>ESRF

### 2:20 PM

**An Integrated Multi-Scale Model for Microstructure Evolution during Solidification of Multi-Component and Multi-Phase Alloys:** *Wenda Tan*<sup>1</sup>; Neil Bailey<sup>1</sup>; Yung Shin<sup>1</sup>; <sup>1</sup>Purdue University

### 2:40 PM

**Calibrated Monte Carlo Simulation of Microstructural Evolution with the Impact of Anisotropic Grain Boundary Energy and Mobility:** *Di Wu*<sup>1</sup>; *Liangzhe Zhang*<sup>2</sup>; Mark Lusk<sup>2</sup>; Timothy Bartel<sup>3</sup>; <sup>1</sup>Northeastern university; <sup>2</sup>Colorado School of Mines; <sup>3</sup>Sandia National Laboratories

### 3:00 PM Break

### 3:20 PM

**Computational Fluid Dynamics (CFD) Simulation of Non-Newtonian Behavior of Metal Matrix Alloy in Casting Process:** *Yaou Wang*<sup>1</sup>; Allen Miller<sup>1</sup>; Khalil Kabiri-bamoradia<sup>1</sup>; <sup>1</sup>The Ohio State University

### 3:40 PM

**Interface Heat Transfer Effects for Solidification Processes:** *Pamela Kobryn*<sup>1</sup>; <sup>1</sup>AFRL

## Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches -- Fundamental and Engineering Issues: Interface Engineering

Program Organizers: Wayne Kaplan, Technion - Israel Institute of Technology; Paul Wynblatt, Carnegie Mellon University; Dominique Chatain, Centre Interdisciplinaire de Nanoscience de Marseille; Mikel Holcomb, West Virginia University

Tuesday PM Room: C120  
October 18, 2011 Location: Columbus Con. Center

Session Chair: Mikel Holcomb, West Virginia University

### 2:00 PM Keynote

**Surface Chemistry and Activity of SOFC Cathode Materials as Thin Films:** *Lu Yan*<sup>1</sup>; Philip Tsang<sup>1</sup>; Sneha Akhade<sup>1</sup>; Tim Fister<sup>2</sup>; Jeffrey Eastman<sup>2</sup>; Paul Fuoss<sup>2</sup>; John Kitchin<sup>1</sup>; *Paul Salvador*<sup>1</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Argonne National Laboratory

### 2:40 PM Invited

**Engineering New Functionalities in Materials: Large Electromechanical Responses in Highly-Strained BiFeO<sub>3</sub> Thin Films:** *Lane Martin*<sup>1</sup>; <sup>1</sup>University of Illinois, Urbana-Champaign

### 3:00 PM Break

### 3:20 PM Invited

**Distinguishing between Chemical Intermixing and Emerging Properties at Epitaxial Oxide Interfaces:** *Hans Christen*<sup>1</sup>; Hyunsik Kim<sup>2</sup>; Maria Varela<sup>1</sup>; Dae Ho Kim<sup>3</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>University of Warwick; <sup>3</sup>Tulane University

### 3:40 PM Keynote

**Ferromagnetic/Antiferromagnetic Interfaces:** *David Lederman*<sup>1</sup>; <sup>1</sup>West Virginia University

## International Symposium on Advances in Nanostructured Materials and Applications: The 2011 Acta Materialia Gold Medal Symposium: Nanometals I: Deformation Mechanisms in Nanostructured Metals

Program Organizers: Haiyan Wang, Texas A&M University; Nugehalli Ravindra, New Jersey Institute of Technology; Alan Ardell, National Science Foundation; Yuntian Zhu, North Carolina State University; Xinghang Zhang, Texas A&M University; Rajiv K. Singh, University of Florida; John Prater, Army Research Office

Tuesday PM Room: E170  
October 18, 2011 Location: Columbus Con. Center

Session Chairs: Amit Misra, Los Alamos National Laboratory; Qiuming Wei, University of North Carolina at Charlotte

### 2:00 PM Invited

**Grain Boundary Structural Influences on Nanopolycrystal Strength and Strain Rate Sensitivity:** *Ronald Armstrong*<sup>1</sup>; <sup>1</sup>University of Maryland

### 2:20 PM Invited

**Grain Boundaries and Ultimate Strength in Bulk Nanostructured Metallic Materials:** *Ruslan Valiev*<sup>1</sup>; Sergey Firstov<sup>2</sup>; <sup>1</sup>Ufa State Aviation Technical University; <sup>2</sup>Frantsevich Institute for Problems of Materials Science

### 2:40 PM Invited

**Microstructural Evolution of Two-Phase Nanocomposites Synthesized by Severe Plastic Deformation Techniques:** *Irene Beyerlein*<sup>1</sup>; Jian Wang<sup>1</sup>; Hashem Mourad<sup>1</sup>; Jason Mayeur<sup>1</sup>; John Carpenter<sup>1</sup>; Sven Vogel<sup>1</sup>; Ruifeng Zhang<sup>1</sup>; Keonwook Kang<sup>1</sup>; Ben Hansen<sup>1</sup>; Curt Bronkhorst<sup>1</sup>; Nathan Mara<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

### 3:00 PM Break

### 3:20 PM Invited

**Ductility and Strategies for Improving Ductility of Bulk Nanostructured Materials:** *Yonghao Zhao*<sup>1</sup>; Y.T. Zhu<sup>2</sup>; E.J. Lavernia<sup>1</sup>; <sup>1</sup>University of California Davis; <sup>2</sup>North Carolina State University, Raleigh

### 3:40 PM Invited

**Deformation in Nanocrystalline Materials: Requirements and Mechanisms:** *Farghalli Mohamed*<sup>1</sup>; <sup>1</sup>University of California, Irvine

#### 4:00 PM Invited

**Fabrication and Deformation Mechanisms in Nanocrystalline Mg Alloys:** *Suveen Mathaudhu<sup>1</sup>; Xiaolei Wu<sup>2</sup>; Khalid Youssef<sup>3</sup>; Carl Koch<sup>3</sup>; Laszlo Kecskes<sup>4</sup>; Yuntian Zhu<sup>3</sup>; <sup>1</sup>U.S. Army Research Office; <sup>2</sup>Institute of Mechanics; <sup>3</sup>North Carolina State University; <sup>4</sup>U.S. Army Research Laboratory*

#### 4:20 PM

**Nano- and Microparticles Impact on Deformation Behaviour of Magnesium:** *Zuzanka Trojanova<sup>1</sup>; Pavel Lukac<sup>1</sup>; <sup>1</sup>Charles University*

#### 4:40 PM Cancelled

**High Strength and Ductile Nanostructured Cu-Ag Alloy through Severe Cold Rolling and Annealing:** *Sitarama Raju Kada<sup>1</sup>; Alexander Kauffmann<sup>2</sup>; Jens Fredudenberger<sup>2</sup>; Vadlamani Subramanya Sarma<sup>3</sup>; <sup>1</sup>Deakin University; <sup>2</sup>IFW Dresden; <sup>3</sup>IIT Madras*

#### 5:00 PM Cancelled

**Microstructure Evolution of Fine Grained AZ91 Magnesium Alloy:** *Kristian Máthi<sup>1</sup>; Jeno Gubicza<sup>2</sup>; Zoltán Hegedus<sup>2</sup>; <sup>1</sup>Faculty of Mathematics and Physics, Charles University; <sup>2</sup>Eötvös Loránd University*

### International Symposium on Defects, Transport and Related Phenomena: Defects and Transport in Ceramics III

*Program Organizers:* Sangtae Kim, University of California, Davis; Ruediger Dieckmann, Cornell University; Doreen Edwards, Alfred University; Manfred Martin, RWTH Aachen University; Thomas Mason, Northwestern University

Tuesday PM  
October 18, 2011

Room: C122  
Location: Columbus Con. Center

*Funding support provided by:* WCU Hybrid Materials Program, Department of Materials Science and Engineering, Seoul National University, Korea

*Session Chairs:* Thomas Mason, Northwestern University; Han-Il Yoo, Seoul National University

#### 2:00 PM Invited

**Effect of Co-Doping of Variable-Valent Acceptors (Mn) and Fixed-Valent Donors (Y) on Electrical Properties and Defect Structure of BaTiO<sub>3</sub>:** *Han-Il Yoo<sup>1</sup>; <sup>1</sup>Department of Materials Science and Engineering*

#### 2:40 PM

**Positron Annihilation Spectroscopy Evidence of Cation Vacancies in Some Oxide Systems:** *Eric Vance<sup>1</sup>; Paul Gaugliardo<sup>2</sup>; James Williams<sup>2</sup>; Zhao-ming Zhang<sup>1</sup>; Joel Davis<sup>1</sup>; <sup>1</sup>ANSTO Materials; <sup>2</sup>Centre for Antimatter-Matter Studies*

#### 3:00 PM Break

#### 3:20 PM Invited

**Oxygen Diffusion and Surface Exchange in Oxides with Anisotropic Crystal Structures:** *Michael Schroeder<sup>1</sup>; <sup>1</sup>RWTH Aachen*

#### 4:00 PM

**Comparison of Structure and Ionic Conductivity in Fractal and Zeolitic Phosphosilicates:** *Arthur Feldman<sup>1</sup>; John Kieffer<sup>1</sup>; <sup>1</sup>University of Michigan*

### Joining of Advanced and Specialty Materials (JASM XIII): Welding Metallurgy

*Program Organizers:* Judith Schneider, Mississippi State University; Norman Zhou, Univ. of Waterloo; Leijun Li, Utah State University; Mathieu Brochu, McGill University; Boian Alexandrov, The Ohio State University; Michael Halbig, U.S. Army Research Laboratory; Akio Hirose, Osaka University; Sammy Tin, Illinois Institute of Technology

Tuesday PM  
October 18, 2011

Room: E161B  
Location: Columbus Con. Center

*Session Chairs:* Boian Alexandrov, The Ohio State University; Thomas Lienert, Los Alamos National Laboratory

#### 2:00 PM

**Continuous Cooling Transformation and Microstructure in the CGHAZ of an HSLA-65 Naval Steel:** *Xin Yue<sup>1</sup>; John Lippold<sup>2</sup>; Boian Alexandrov<sup>2</sup>; Sudarsanam Babu<sup>2</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>The Ohio State University*

#### 2:20 PM

**Microstructural Enablers for Improving Fatigue Performance of Spot Weld Joints in Advanced High Strength Steels:** *Sampath Vanimisetti<sup>1</sup>; David Sigler<sup>1</sup>; <sup>1</sup>General Motors Company*

#### 2:40 PM

**Metallurgical Characterization of Armor Alloys for Development and Optimization of Induction Bending Procedures:** *Nicholas Kullman<sup>1</sup>; Boian Alexandrov<sup>1</sup>; <sup>1</sup>The Ohio State University*

#### 3:00 PM Break

#### 3:20 PM

**Dissimilar Joining of Magnesium Alloy and Steel by Resistance Spot Welding:** *Kenji MIYAMOTO<sup>1</sup>; Shigeyuki NAKAGAWA<sup>1</sup>; Hiroki SAKAMOTO<sup>1</sup>; Shingo IWATANI<sup>2</sup>; Shinji HOJO<sup>2</sup>; Takahiro TACHIBANA<sup>2</sup>; Tomo OGURA<sup>2</sup>; Akio HIROSE<sup>2</sup>; Kojiro F. KOBAYASHI<sup>3</sup>; <sup>1</sup>NISSAN MOTOR CO., LTD.; <sup>2</sup>Osaka University; <sup>3</sup>The Wakasa Wan Energy Research Center*

#### 3:40 PM

**GTAW Dissimilar Metals Joining between Steel/AZ31 Magnesium Alloy by Self-Brazing Technique:** *Rattana Borrisutthekul<sup>1</sup>; Chawinee Pothong<sup>1</sup>; <sup>1</sup>Suranaree University of Technology*

#### 4:00 PM

**Effects of Welding Parameters and Consumable on Microstructure and Mechanical Properties of Dissimilar Ferritic Stainless Steel and Low Carbon Steel Joints:** *Hesam Pouraliakbar<sup>1</sup>; Mahmoud Sarkari Khorrami<sup>1</sup>; Reza Farshadnia<sup>1</sup>; Mohammad Ali Mostafaei<sup>1</sup>; Amir Hossein Kokabi<sup>1</sup>; <sup>1</sup>Sharif University of Technology*

#### 4:20 PM

**Effects of Pulsed Laser Welding Parameters on Microstructure and Mechanical Properties of a Fe-Ni Alloy Joints:** *Hesam Pouraliakbar<sup>1</sup>; Reza Farshadnia<sup>1</sup>; Amir Hossein Kokabi<sup>1</sup>; <sup>1</sup>Sharif University of Technology*

#### 4:40 PM

**Evaluation of Microstructure and Mechanical Properties of Advanced High Strength Steel in Resistance Spot Welding:** *Chikaumi Sawanishi<sup>1</sup>; Tomo Ogura<sup>1</sup>; Koichi Taniguchi<sup>2</sup>; Rinsei Ikeda<sup>2</sup>; Shigeru Endo<sup>2</sup>; Koichi Yasuda<sup>2</sup>; Akio Hirose<sup>1</sup>; <sup>1</sup>Osaka University; <sup>2</sup>JFE Steel Corporation*



## Journal of Undergraduate Materials Research: Session I

*Program Organizer:* Shaimaa Abdallah, Virginia Tech

Tuesday PM                      Room: E160A  
October 18, 2011              Location: Columbus Con. Center

*Session Chair:* Ivar Reimanis, Colorado School of Mines

### 2:00 PM

**A Combined Numerical and Experimental Approach to Measuring Gap Conductance for Precision Glass Molding:** *Christopher Ostrouchov*<sup>1</sup>; Peiman Mosaddegh<sup>1</sup>; John Ziegert<sup>2</sup>; David Musgraves<sup>1</sup>; Paul Joseph<sup>2</sup>; Dhananjay Joshiand<sup>2</sup>; Peter Wachtel<sup>1</sup>; Kathleen Richardson<sup>1</sup>; <sup>1</sup>Materials Engineering Clemson University; <sup>2</sup>Mechanical Engineering Clemson University

### 2:20 PM

**Characterization of a Shot Blast System:** *Haley Cherniuk*<sup>1</sup>; Alan Druschitz<sup>2</sup>; Carlos Suchicital<sup>2</sup>; Robert Hendricks<sup>2</sup>; <sup>1</sup>Virginia Tech ; <sup>2</sup>Virginia Tech

## Magnetoelectric Multiferroic Thin Films and Multilayers: Magnetoelectric Microstructures and Properties

*Program Organizer:* Shashank Priya, Virginia Tech

Tuesday PM                      Room: C221  
October 18, 2011              Location: Columbus Con. Center

*Session Chair:* To Be Announced

### 2:00 PM

**Controlled Growth of Epitaxial BiFeO<sub>3</sub> Films Using Self-Assembled BiFeO<sub>3</sub>-CoFe<sub>2</sub>O<sub>4</sub> Multiferroic Heterostructures as a Seed Layer:** *Yanxi Li*<sup>1</sup>; Yaodong Yang<sup>1</sup>; Jianjun Yao<sup>1</sup>; Ravindranath Viswan<sup>1</sup>; Jiefang Li<sup>1</sup>; Dwight Viehland<sup>1</sup>; <sup>1</sup>Virginia Tech

### 2:20 PM

**Increased Conductivity of Artificially Created Vortex Cores in Epitaxial BiFeO<sub>3</sub> Thin Films:** *Benjamin Winchester*<sup>1</sup>; Nina Balke<sup>2</sup>; Anna Morozovska<sup>3</sup>; Sergei Kalinin<sup>2</sup>; Long-Qing Chen<sup>1</sup>; <sup>1</sup>Pennsylvania State University; <sup>2</sup>Oak Ridge National Laboratory; <sup>3</sup>National Academy of Science of Ukraine

### 2:40 PM

**Magneto-Electric Response in Semi-Monolithic CoFe<sub>2</sub>O<sub>4</sub>/Pb(Mg,Nb)O<sub>3</sub>-PbTiO<sub>3</sub> Heterostructures:** *Zhiguang Wang*<sup>1</sup>; Jaydip Das<sup>1</sup>; Ravindranath Viswan<sup>1</sup>; Jiefang Li<sup>1</sup>; Dwight Viehland<sup>1</sup>; <sup>1</sup>Virginia Tech

## Materials Science Challenges for Nuclear Applications: Microstructure Evolution

*Program Organizers:* Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprashad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Tuesday PM                      Room: C225  
October 18, 2011              Location: Columbus Con. Center

*Session Chairs:* Kevin Fox, Savannah River National Laboratory; Amit Misra, Los Alamos National Laboratory

### 3:20 PM Invited

**Microstructure Stability in Irradiated Materials:** *Anter El-Azab*<sup>1</sup>; <sup>1</sup>Florida State University

### 4:00 PM

**Computer Simulation of Swift Heavy Ion Irradiation Effects in Ceramics:** *Ram Devanathan*<sup>1</sup>; <sup>1</sup>Pacific Northwest National Laboratory

## Materials Science Challenges for Nuclear Applications: Nanostructured Materials

*Program Organizers:* Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprashad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Tuesday PM                      Room: C225  
October 18, 2011              Location: Columbus Con. Center

*Session Chairs:* Elizabeth Hoffman, Savannah River National Laboratory; Anter El-Azab, Florida State University

### 2:00 PM Invited

**Development of Ultra-High Strength Radiation Damage-Tolerant Nanocomposites via Atomic-Scale Design of Interfaces:** *Amit Misra*<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

### 2:40 PM

**Precursor Derived Nanostructured Si-C-X Materials for Nuclear Applications:** *Shelly Arreguin*<sup>1</sup>; Rajendra Bordia<sup>2</sup>; <sup>1</sup>University of Washington; <sup>2</sup>University of Washington

### 3:00 PM Break



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## Multifunctional Oxides: Session III

Program Organizer: Xiaoqing Pan, University of Michigan

Tuesday PM                      Room: E162A  
October 18, 2011                Location: Columbus Con. Center

Session Chair: Chonglin Chen, UTSA

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### 2:00 PM Invited

#### Heterostructured Titania/Ferroelectric Catalysts for Water Splitting:

Li Li<sup>1</sup>; Andrew Schultz<sup>1</sup>; Yiling Zhang<sup>1</sup>; Paul Salvador<sup>1</sup>; Gregory Rohrer<sup>1</sup>;  
<sup>1</sup>Carnegie Mellon University

### 2:40 PM

#### High Frequency Magnetodielectric Properties of Hexagonal Ferrites:

Yajie Chen<sup>1</sup>; Trifon Fitchorov<sup>1</sup>; Bolin Hu<sup>1</sup>; Anton Geiler<sup>1</sup>; Carmine Vittoria<sup>1</sup>;  
Vincent Harris<sup>1</sup>; <sup>1</sup>Northeastern University

### 3:00 PM Break

### 3:20 PM Invited

Magnetism and Electronic Structure of Eu<sup>2+</sup> Perovskite Oxides: Hirofumi  
Akamatsu<sup>1</sup>; <sup>1</sup>Kyoto University

### 4:00 PM

#### Anomalous Magnetic Behavior of Cobalt Doped Sm<sub>2</sub>O<sub>3</sub> Thin Films:

Nathan Gray<sup>1</sup>; Ashutosh Tiwari<sup>1</sup>; <sup>1</sup>University of Utah

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## Nano- and Atomic-Scale Fracture: Nanowires

Program Organizers: Lawrence Friedman, NIST; Stephen Freiman, NIST

Tuesday PM                      Room: C125  
October 18, 2011                Location: Columbus Con. Center

Session Chair: Lawrence Friedman, National Institute of Standards and Technology

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### 2:00 PM

#### Thinning and Breaking of Gold Nanowires: Structural Self-Ordering and

Quantized Conductance: Francesca Tavazza<sup>1</sup>; Lyle Levine<sup>1</sup>; Anne Chaka<sup>1</sup>;  
Douglas Smith<sup>1</sup>; Jon Pratt<sup>1</sup>; <sup>1</sup>National Institute of Standards and Technology

### 2:40 PM

#### Mechanical Characteristics of Cracked Gold Nanowires under Torsional

Loading: Karan Saini<sup>1</sup>; Navin Kumar<sup>1</sup>; <sup>1</sup>IIT Ropar

### 3:00 PM

#### Elongation and Rupture of 1-nm Gold Rods: When Size and Shape

Matters: Maureen Lagos<sup>1</sup>; Fernando Sato<sup>2</sup>; Douglas Galvão<sup>3</sup>; Daniel Ugarte<sup>3</sup>;  
<sup>1</sup>Laboratório Nacional de Luz Síncrotron (LNLS); <sup>2</sup>Univ. Federal de Juiz de  
Fora; <sup>3</sup>Universidade Estadual de Campinas - UNICAMP

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## Next Generation Biomaterials: Metallic, Polymeric, and Ceramic Biomaterials

Program Organizers: Roger Narayan, Univ of North Carolina & North Carolina State Univ; Kalpana Katti, North Dakota State University; Kajal Mallick, University of Warwick; Vilupanur Ravi, California State Polytechnic University, Pomona; Varshni Singh, Louisiana State University

Tuesday PM                      Room: C215  
October 18, 2011                Location: Columbus Con. Center

Session Chairs: Vilupanur Ravi, California State Polytechnic University, Pomona; Rajarshi Banerjee, University of North Texas

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### 2:00 PM Invited

#### Laser Processed Tantalum: Mechanical, In vitro Wear and Biological

Properties: Amit Bandyopadhyay<sup>1</sup>; Vamsi Balla<sup>1</sup>; Susmita Bose<sup>1</sup>; <sup>1</sup>Washington State University

### 2:20 PM Invited

#### Stability of Boron-Containing Titanium Alloys in Saline and Related

Bioreceptor Studies: Vilupanur Ravi<sup>1</sup>; Shaun Rogers<sup>1</sup>; Mehnaz Malek<sup>1</sup>; Daniel Surmenian<sup>1</sup>; Isaac Priddy<sup>1</sup>; Ryan Urak<sup>1</sup>; Steve Alas<sup>1</sup>; Suresh Divi<sup>2</sup>; Sesh Tamirisakandala<sup>3</sup>; Daniel Miracle<sup>4</sup>; <sup>1</sup>California State Polytechnic University, Pomona; <sup>2</sup>Titanium Metals Corporation (TIMET); <sup>3</sup>FMW Composite Systems Inc; <sup>4</sup>Air Force Research Laboratory

### 2:40 PM Invited

#### Next-Generation Rotary Endodontic Instruments Fabricated from

Special NiTi Alloy: William Brantley<sup>1</sup>; Jie Liu<sup>1</sup>; William Clark<sup>1</sup>; Masahiro Iijima<sup>2</sup>; Libor Kovarik<sup>1</sup>; Fengyuan Zheng<sup>1</sup>; Scott Schrickler<sup>1</sup>; Satish Alapati<sup>3</sup>; John Nusstein<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>School of Dentistry, Health Sciences University of Hokkaido; <sup>3</sup>University of Illinois at Chicago

### 3:00 PM Break

### 3:20 PM Invited

#### Surface Engineering Approaches for Beta Titanium Alloys Used in

Orthopedic Implants (Invited): Peeyush Nandwana<sup>1</sup>; Soumya Nag<sup>1</sup>; Sameer Paital<sup>1</sup>; Thomas Scharf<sup>1</sup>; Narendra Dahotre<sup>1</sup>; Rajarshi Banerjee<sup>1</sup>; <sup>1</sup>University of North Texas

### 3:40 PM

#### Biomedical Titanium Alloy with Ultralow Elastic Modulus and High

Strength: Yulin Hao<sup>1</sup>; Shujun Li<sup>1</sup>; Rui Yang<sup>1</sup>; <sup>1</sup>Institute of metal research, chinese academy of sciences

### 4:00 PM

#### Alkoxysilane Mediated Generation of Gold Nanoparticles: Development

of Novel Electrocatalytic Materials: Prem Pandey<sup>1</sup>; Dheeraj Chauhan<sup>1</sup>;  
<sup>1</sup>Institute of Technology, Banaras Hindu University

## Novel Sintering Processes and News in Traditional Sintering and Grain Growth: Field Assisted and NanoSintering II

*Program Organizers:* Ricardo H. R. Castro, University of California at Davis; Douglas Gouvêa, Universidade de São Paulo

Tuesday PM  
October 18, 2011

Room: C222  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

### 2:00 PM Invited

**Integrated Electro-Thermo-Mechanical Analysis of Spark Plasma Sintering:** *Eugene Olevsky<sup>1</sup>; Cristina Garcia-Cordona<sup>1</sup>; Evan Khaleghi<sup>1</sup>; William Bradbury<sup>1</sup>; Wei Li<sup>1</sup>; Randall German<sup>1</sup>; <sup>1</sup>San Diego State University*

### 2:40 PM

**A Pathway to the Scaled-Up Manufacturing of Nanostructured Refractory Ceramics for Ultra-High Temperature Applications:** *James Kelly<sup>1</sup>; Braeden Clark<sup>1</sup>; Raghunath Kanakala<sup>1</sup>; Olivia Graeve<sup>1</sup>; <sup>1</sup>Alfred University*

### 3:00 PM Break

### 3:20 PM Invited

**Understanding Silica-Kaolinite Composite Sintering:** *Kathy Lu<sup>1</sup>; Wenle Li<sup>1</sup>; John Walz<sup>1</sup>; <sup>1</sup>Virginia Tech*

### 4:00 PM

**Densification of Hydroxyapatite: Volume Diffusion or Grain Boundary Diffusion?:** *Tiandan Chen<sup>1</sup>; Anthony Finoli<sup>1</sup>; Ian Nettleship<sup>1</sup>; <sup>1</sup>University of Pittsburgh*

## Pb-Free Solders and Next Generation Interconnects: Electrically Conductive Adhesives

*Program Organizers:* Sehoon Yoo, Korea Institute of Industrial Technology; Andre Lee, Michigan State University; Govindarajan Muralidharan, Oak Ridge National Laboratory; Young-Ho Kim, Hanyang University

Tuesday PM  
October 18, 2011

Room: E160B  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

### 2:00 PM Invited

**Mechanical Reliability of Flip-Chip Packaging: From Cu/Low-k Interconnects to Underfill:** *Taek-Soo Kim<sup>1</sup>; <sup>1</sup>KAIST*

### 2:40 PM

**Development of 20  $\mu$ m Pitch COG Joints Fabricated Using Sn/Cu Bumps and NCAs:** *Sun-Chul Kim<sup>1</sup>; Myung-Hwan Hong<sup>1</sup>; Ji-Hyun Lee<sup>1</sup>; Young-Ho Kim<sup>1</sup>; <sup>1</sup>Hanyang University*

### 3:00 PM Break

### 3:20 PM Invited

**Recent Advances on Electrically Conductive Adhesives for Microelectronics Applications:** *Kyoung-sik Moon<sup>1</sup>; CP Wong<sup>2</sup>; Rongwei Zhang<sup>1</sup>; <sup>1</sup>Georgia Tech; <sup>2</sup>the Chinese University of Hong Kong*

### 4:00 PM

**Development of Inclined Conductive Bump (ICB) for Next Generation Interconnection:** *Ah-Young Park<sup>1</sup>; Sun-Rak Kim<sup>1</sup>; Choong. D Yoo<sup>1</sup>; Taek-Soo Kim<sup>1</sup>; <sup>1</sup>KAIST*

## Perspectives for Emerging Materials Professionals: Early Strategies for Career Development: Session II

*Program Organizers:* Greg Oberson, U.S. Nuclear Regulatory Commission; Chirag Shah, Exova

Tuesday PM  
October 18, 2011

Room: B200/201  
Location: Columbus Con. Center

*Session Chairs:* Nitin Chopra, University of Alabama; Umesh Patil, Caterpillar, Inc.

### 2:00 PM

**Career Decisions And Their Medium-term Impact:** *Kirk Rogers<sup>1</sup>; <sup>1</sup>Lorex Industries*

### 2:20 PM

**Small Business and Disruptive Technologies:** *Greg Engleman<sup>1</sup>; Joshua Caris<sup>1</sup>; Anupam Ghildyal<sup>1</sup>; Andrew Sherman<sup>1</sup>; <sup>1</sup>MesoCoat*

### 2:40 PM

**The Early Stages of a Evolving Lifelong Career:** *Elizabeth Hoffman<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory*

### 3:00 PM Break

### 3:20 PM

**Following your Passion while Navigating the Bumps in the Road:** *Christopher Berndt<sup>1</sup>; <sup>1</sup>Swinburne University of Technology*

## Phase Stability, Diffusion, Kinetics and their Applications (PSDK-VI): Diffusion Modeling and Measurement

*Program Organizers:* Jeffrey LaCombe, University of Nevada, Reno; Yongho Sohn, University of Central Florida; John Morral, Ohio State University; Ursula Kattner, National Institute of Standards and Technology; Abhijeet Misra, QuesTek Innovations LLC

Tuesday PM  
October 18, 2011

Room: C214  
Location: Columbus Con. Center

*Session Chairs:* Sudarsanam Babu, The Ohio State University; Carelyn Campbell, National Institute of Standards and Technology

### 2:00 PM

**Extraction of Diffusion Coefficients from Binary Diffusion Profiles:** *Qiaofu Zhang<sup>1</sup>; Ji-Cheng Zhao<sup>1</sup>; <sup>1</sup>The Ohio State University*

### 2:20 PM

**Experimental Uncertainty Propagation in Depth-Profiling Diffusion Experiments:** *Alonso Jaques<sup>1</sup>; Jeffrey LaCombe<sup>2</sup>; <sup>1</sup>Universidad Técnica Federico Santa María; <sup>2</sup>University of Nevada, Reno*

### 2:40 PM

**Interdiffusion, Intrinsic Diffusion, Atomic Mobility and Vacancy Wind Effect in Uranium-Molybdenum Alloy:** *Ke Huang<sup>1</sup>; Dennis Keiser<sup>2</sup>; Yongho Sohn<sup>1</sup>; <sup>1</sup>University of Central Florida; <sup>2</sup>Idaho National Laboratory*

### 3:00 PM Break

### 3:20 PM

**Tracer Diffusion Studies in Mg-Al-Zn:** *Nagraj Kulkarni<sup>1</sup>; Jerry Hunter<sup>2</sup>; Yongho Sohn<sup>3</sup>; Sarah Brennan<sup>3</sup>; Kevin Coffey<sup>3</sup>; Balasubramaniam Radhakrishnan<sup>1</sup>; Peter Todd<sup>1</sup>; Graeme Murch<sup>4</sup>; Irina Belova<sup>4</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>Virginia Polytechnic Institute and State University; <sup>3</sup>University of Central Florida; <sup>4</sup>The University of Newcastle*

3:40 PM

**Investigation on Effects of Zr Allotropic Transformation on Diffusion in the Fe-Zr System:** *Ashley Ewh<sup>1</sup>; Judith Dickson<sup>1</sup>; Bulent Sencer<sup>2</sup>; J. Kennedy<sup>2</sup>; Yongho Sohn<sup>1</sup>; <sup>1</sup>University of Central Florida; <sup>2</sup>Idaho National Laboratory*

4:00 PM

**Diffusivity Calculations by First-Principles in AFM Cr and FM Ni:** *Chelsey Zacherl<sup>1</sup>; ShunLi Shang<sup>1</sup>; Yi Wang<sup>1</sup>; Zi-Kui Liu<sup>1</sup>; <sup>1</sup>The Pennsylvania State University*

4:20 PM

**The Influence of Mass Transfer on the Rate of Interface Reaction under Non-Isothermal Conditions:** *guanglei tan<sup>1</sup>; <sup>1</sup>University of Science and Technology Liaoning*

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## **Professor K. K. Chawla Honorary Symposium on Fibers, Foams and Composites: Science and Engineering: Foams II**

*Program Organizers:* Nikhilesh Chawla, Arizona State University; Aldo Boccaccini, University of Erlangen-Nuremberg; Gary Gladysz, Trelleborg USA; Pedro D. Portella, Federal Institute of Testing and Materials BAM

Tuesday PM  
October 18, 2011

Room: D234  
Location: Columbus Con. Center

*Session Chairs:* David Dunand, Northwestern University; Gary Gladysz, Trelleborg USA

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2:00 PM **Invited**

**Lightweight Composite Materials for Fire Control and Prevention in Hydrocarbon Storage Tanks:** *Gary Gladysz<sup>1</sup>; Oscar Etienne<sup>1</sup>; Robert Kelly<sup>1</sup>; <sup>1</sup>Trelleborg USA*

2:40 PM

**Hydrothermal Aging of Polypropylene Syntactic Foams:** *Kipp Carlisle<sup>1</sup>; Gary Gladysz<sup>1</sup>; Mark Koopman<sup>2</sup>; <sup>1</sup>Trelleborg USA; <sup>2</sup>Harvard University*

3:00 PM **Break**

3:20 PM **Invited**

**Behaviour of Open Cell Ceramic Foams in Tension:** *Ivo Dlouhy<sup>1</sup>; Lukas Rehorek<sup>1</sup>; Zdenek Chlup<sup>1</sup>; <sup>1</sup>Institute of Physics of Materials, Academy of Sciences of the Czech Republic*

4:00 PM

**Damage and Failure of Alumina Fibre Reinforced Aluminium:** *Andreas Rossoll<sup>1</sup>; Benedikt Moser<sup>1</sup>; Andreas Mortensen<sup>1</sup>; <sup>1</sup>Ecole Polytechnique Fédérale de Lausanne*

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## **Recent Advances in Structural Characterization of Materials: Advanced Methods and Applications**

*Program Organizers:* Chad Parish, Oak Ridge National Laboratory; Roumiana Petrova, New Jersey Institute of Tech; Jacob Jones, University of Florida; Zhonghou Cai, Argonne National Laboratory; Gang Chen, Ohio University

Tuesday PM  
October 18, 2011

Room: C212  
Location: Columbus Con. Center

*Session Chair:* Gang Chen, Ohio University

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2:00 PM

**A Multiple Partial Unloading Indentation Technique for Elastic-Plastic Mechanical Property Evaluation: Numerical and Experimental Investigation:** *Kwangsoon Lee<sup>1</sup>; Jared Tannenbaum<sup>1</sup>; Bruce Kang<sup>1</sup>; Mary Anne Alvin<sup>2</sup>; <sup>1</sup>West Virginia University; <sup>2</sup>Department of Energy*

2:20 PM

**Crystal Structure and Surface Analysis of Diamond-Like Semiconductor Single Crystals:** *Kimberly Rosmus<sup>1</sup>; Jacilynn Brant<sup>1</sup>; Jacqueline Sturgeon<sup>2</sup>; Kristin Bunker<sup>2</sup>; Karen Harris<sup>2</sup>; Jennifer Aitken<sup>1</sup>; <sup>1</sup>Duquesne University; <sup>2</sup>RJ Lee Group*

2:40 PM **Break**

3:00 PM

**Stress Partitioning Behavior in BCC/FCC Multilayered Steels Measured by In Situ Neutron Diffraction during Tensile Deformation:** *Mayumi Ojima<sup>1</sup>; Junya Inoue<sup>1</sup>; Shoichi Nambu<sup>1</sup>; Pingguang Xu<sup>2</sup>; Koichi Akita<sup>2</sup>; Hiroshi Suzuki<sup>2</sup>; Toshihiko Koseki<sup>1</sup>; <sup>1</sup>The University of Tokyo; <sup>2</sup>Japan Atomic Energy Agency*

3:20 PM

**Advanced Characterization of the Helical Growth of Dendritic Structures in Synthetic and Naturally Occurring Magma:** *S. Knox<sup>1</sup>; Michael Chapman<sup>1</sup>; Jay Tiley<sup>2</sup>; Adam Shiveley<sup>3</sup>; Gopal Viswanathan<sup>4</sup>; Juila Hammer<sup>5</sup>; <sup>1</sup>Southwestern Ohio Council for Higher Education/Air Force Research Laboratory; <sup>2</sup>Air Force Research Laboratory; <sup>3</sup>Universal Technology Corporation; <sup>4</sup>Universal Energy Systems, Inc; <sup>5</sup>University of Hawaii at Manoa*

3:40 PM

**Microscopic Surface Mapping of the Thermal Diffusivity by Photothermal Confocal Defocusing:** *Oscar Martinez<sup>1</sup>; Nelida Mingolo<sup>1</sup>; Ulises Crossa Archioli<sup>2</sup>; <sup>1</sup>Universidad de Buenos Aires; <sup>2</sup>Toltek SRL*

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## **Recent Developments in Steel Processing: Session I**

*Program Organizer:* Bhaskar Yalamanchili, Gerdau Ameristeel.com

Tuesday PM  
October 18, 2011

Room: D142/143  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

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2:00 PM

**Factors Affecting Gauge Uniformity of Flat Cold Rolled AHSS:** *Artem Marmulev<sup>1</sup>; Gwenola Herman<sup>1</sup>; Evgueni Poliak<sup>1</sup>; Lyudmila Kaputkina<sup>2</sup>; <sup>1</sup>ArcelorMittal Global R&D; <sup>2</sup>National University of Science and Technology "MISIS"*

2:20 PM

**Numerical Simulation of Forming of Heat Resistant 1.4922 Steel:** *Petr Martinek<sup>1</sup>; Martin Balcar<sup>2</sup>; <sup>1</sup>COMTES FHT; <sup>2</sup>ŽDAS a.s.*

Tuesday PM

2:40 PM

**Interstitial Hardening of Austenite Stainless Steels by Low Temperature Gas Phase Nitriding:** Dandan Wu<sup>1</sup>; Hal Kahn<sup>1</sup>; Gary Michal<sup>1</sup>; Frank Ernst<sup>1</sup>; Arthur Heuer<sup>1</sup>; <sup>1</sup>Case Western Reserve University

3:00 PM Break

3:20 PM

**Orientation-Dependent Solubility and Diffusion Depth during Low-Temperature Nitriding of Austenitic Stainless Steel:** Harold Kahn<sup>1</sup>; Dandan Wu<sup>1</sup>; Xiaoting Gu<sup>1</sup>; Gary Michal<sup>1</sup>; Frank Ernst<sup>1</sup>; Arthur Heuer<sup>1</sup>; <sup>1</sup>Case Western Reserve University

3:40 PM

**Processing of Hypoeutectoid Steels by Mechanical Alloying:** Federico Pulvirenti<sup>1</sup>; Alex Aning<sup>1</sup>; <sup>1</sup>Virginia Tech

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## Shape Memory Alloys: Alloy Behavior

*Program Organizer:* Mohammad Elahinia, University of Toledo

Tuesday PM

October 18, 2011

Room: D242/243

Location: Columbus Con. Center

*Session Chair:* Walter Anderson, University of Toledo

2:00 PM

**Development of Simulation Tools for Analysing the Actuation of Smart Materials:** Velaphi Msomi<sup>1</sup>; Kazeem Sanusi<sup>2</sup>; Graeme Oliver<sup>1</sup>; Oscar Philander<sup>1</sup>; <sup>1</sup>Cape Peninsula University of Technology; <sup>2</sup>Stellenbosch University

2:20 PM

**Mechanical Properties of High Strength NiTiHfPd Shape Memory Alloys:** Haluk Karaca<sup>1</sup>; Burak Basaran<sup>1</sup>; Emre Acar<sup>1</sup>; Ronald Noebe<sup>2</sup>; <sup>1</sup>UNIVERSITY OF KENTUCKY; <sup>2</sup>NASA

2:40 PM

**The Effect of Boundary Condition on the Torsional Profile of the NiTi Superelastic Wires:** Zohreh Karbaschi<sup>1</sup>; Ehsan Izadi<sup>1</sup>; Mohammad Elahinia<sup>1</sup>; <sup>1</sup>The University of Toledo

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## Steel Product Metallurgy and Applications: Tubular and Plate Products

*Program Organizer:* Bhaskar Yalamanchili, Gerdau Ameristeel.com

Tuesday PM

October 18, 2011

Room: D132

Location: Columbus Con. Center

*Session Chair:* To Be Announced

2:00 PM Cancelled

**Battelle Properties for X60 and X65 Steel:** Hamid Bayati<sup>1</sup>; Claire Davis<sup>1</sup>; <sup>1</sup>University of Birmingham

2:20 PM

**Tensile Behaviour and Fracture Properties of X80 Linepipe Steel:** Michael Gaudet<sup>1</sup>; Warren Poole<sup>1</sup>; <sup>1</sup>University of British Columbia

2:40 PM

**The Effect of Microstructure on the Mechanical Properties of X80 Microalloyed Steel:** Katherine Jonsson<sup>1</sup>; Douglas Ivey<sup>1</sup>; Hani Henein<sup>1</sup>; <sup>1</sup>University of Alberta

3:00 PM Break

3:20 PM

**Influence of C and Nb on Microstructures and Properties of As-Rolled and Heat Treated ULCS Steels:** Pasi Suikkanen<sup>1</sup>; Anthony Deardo<sup>2</sup>; Pentti Karjalainen<sup>1</sup>; David Porter<sup>1</sup>; <sup>1</sup>University of Oulu; <sup>2</sup>University of Pittsburgh

3:40 PM

**Properties of Low Carbon Steel with Various Microalloying Additions after Particular Thermomechanical Processing:** Pavel Podany<sup>1</sup>; Martin Balcar<sup>2</sup>; <sup>1</sup>COMTES FHT; <sup>2</sup>ŽDAS a.s.

4:00 PM

**Improved Casing for Shales:** Ezequiel Martínez Mamone<sup>1</sup>; Gustavo Kissner<sup>1</sup>; <sup>1</sup>Tenaris

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## Surface Properties of Biomaterials: Bioglass and Cellular Interactions

*Program Organizers:* Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Thomas Webster, Brown University; Sharmila Mukhopadhyay, Wright State University; Paul Calvert, University of Massachusetts; Mukesh Kumar, Biomet Inc

Tuesday PM

October 18, 2011

Room: C216

Location: Columbus Con. Center

*Session Chairs:* Mukesh Kumar, Biomet Inc; Mangal Roy, Washington State University

2:00 PM Invited

**Electrophoretic Deposition of Biomaterials:** Aldo Boccaccini<sup>1</sup>; <sup>1</sup>University of Erlangen-Nuremberg

2:40 PM

**Effect of Surface Roughness of 45S Bioactive Glass on the Response of Bone Cells:** Raina Jain<sup>1</sup>; Jutta Marzillier<sup>1</sup>; Matthias Falk<sup>1</sup>; Shaojie Wang<sup>1</sup>; Hassan Moawad<sup>1</sup>; Himanshu Jain<sup>1</sup>; <sup>1</sup>Lehigh University

3:00 PM Break

3:20 PM Invited

**Influences of Sr and Zn Dopants on Osteoclast Differentiation and Resorption:** Mangal Roy<sup>1</sup>; Gary Fielding<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; Susmita Bose<sup>1</sup>; <sup>1</sup>Washington State University

4:00 PM Invited

**Characterization and Design of the HA-Ti Composite Surface for Ti-Based Implants:** Ling Li<sup>1</sup>; Kyle Crosby<sup>1</sup>; Monica Sawicki<sup>1</sup>; Leon Shaw<sup>1</sup>; Yong Wang<sup>1</sup>; <sup>1</sup>University of Connecticut

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## Surface Protection for Enhanced Materials Performance: Science and Technology: Thermal Barrier Coatings

*Program Organizers:* Rodney Trice, Purdue University; Dongming Zhu, NASA Glenn Research Center; Daniel Mumm, University of California-Irvine; Hua-Tay Lin, Oak Ridge National Laboratory; Pravansu Mohanty, University of Michigan; Yutaka Kagawa, The University of Tokyo; Kang Lee, Rolls Royce; Charles Kay, ASB Industries, Inc.; Luc Pouliot, TECNAR Automation Ltd.

Tuesday PM                      Room: D230  
October 18, 2011              Location: Columbus Con. Center

*Session Chairs:* Yutaka Kagawa, The University of Tokyo; Rodney Trice, Purdue University

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### 2:00 PM Invited

**Thermal Barrier Coatings for Resistance Against Attack by Molten Silicate Deposits from CMAS Sand, Volcanic Ash, or Coal Fly Ash Ingested by Gas-Turbine Engines:** *Nitin Padture*<sup>1</sup>; <sup>1</sup>The Ohio State University

### 2:40 PM

**Performance of CMAS Infiltrated EB-PVD Gd<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> TBCs in a Thermal Gradient:** *Elisa Zaleski*<sup>1</sup>; R. Wesley Jackson<sup>1</sup>; Carlos Levi<sup>1</sup>; <sup>1</sup>UC Santa Barbara

### 3:00 PM Break

### 3:20 PM

**Change of Stress-Strain Behaviors in EB-PVD TBC Coating Systems with the Progress of Uniaxial Out-of-Phase Thermo-Mechanical Fatigue Process:** *Rumi Kitazawa*<sup>1</sup>; Yutaka Kagawa<sup>1</sup>; <sup>1</sup>The University of Tokyo

### 3:40 PM

**Evolution of hot corrosion resistance of YSZ and Gd<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> thermal barrier coatings in Na<sub>2</sub>SO<sub>4</sub>+V<sub>2</sub>O<sub>5</sub> at 1050°C:** *M.Hamed Habibi*<sup>1</sup>; Li Wang<sup>1</sup>; Shengmin Guo<sup>1</sup>; <sup>1</sup>Louisiana State university

### 4:00 PM

**Phase Stability and Thermo-Physical Properties of (La<sub>1-x</sub>Gd<sub>x</sub>)<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> Complex Oxide Systems for Thermal Barrier Coatings (TBCs):** *Hyung-Tae Kim*<sup>1</sup>; Joo-Hee Son<sup>1</sup>; Kil-ho Kwak<sup>1</sup>; Seongwon Kim<sup>1</sup>; Sung-Min Lee<sup>1</sup>; Yoon-Suk Oh<sup>1</sup>; Byung-Koog Jang<sup>2</sup>; <sup>1</sup>Korea Institute of Ceramic Engineering and Technology; <sup>2</sup>National Institute of Materials Science



## Additive Manufacturing of Metals: Laser-Based AM Processes

**Program Organizers:** Ian D. Harris, EWI; Ulf Ackelid, Arcam AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, Ohio State University; Brent Stucker, University of Louisville

Wednesday AM  
October 19, 2011

Room: D130  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

### 8:00 AM

#### Additive Manufacturing of Metallic Components - A Resource Efficient

**Production Method:** *Chris Tuck*<sup>1</sup>; David Brackett<sup>1</sup>; Chang Jing Kong<sup>1</sup>; Marco Simonelli<sup>1</sup>; Ricky Wildman<sup>1</sup>; Ian Ashcroft<sup>1</sup>; Yau Yau Tse<sup>1</sup>; Richard Hague<sup>1</sup>; <sup>1</sup>Loughborough University

### 8:40 AM

#### An Integrated Model of Laser Clad Formation

**Using CFD and FE Methods:** Michael Vogel<sup>1</sup>; Juansethi Ibarra-Medina<sup>1</sup>; Narcisse N'Dri<sup>2</sup>; Andrew Pinkerton<sup>1</sup>; *Harald Porzner*<sup>3</sup>; <sup>1</sup>The University of Manchester; <sup>2</sup>ESI GmbH; <sup>3</sup>ESI North America

### 9:00 AM

**Control and Monitoring of Laser Deposition Processes:** Richard Grylls<sup>1</sup>; David Keicher<sup>1</sup>; James Craig<sup>2</sup>; <sup>1</sup>Optomec Inc.; <sup>2</sup>Stratronics, Inc.

### 9:20 AM

#### Comparison of Direct and Indirect Laser Sintering of Stainless Steel:

*Kumaran Chakravarthy*<sup>1</sup>; Phani Vallabhajoyula<sup>1</sup>; David Bourell<sup>1</sup>; Khaled Abdel-Ghany<sup>2</sup>; <sup>1</sup>University of Texas at Austin; <sup>2</sup>Central Metallurgical R&D Institute (CMRDI)

### 9:40 AM Break

### 10:00 AM

#### Initial Developments in Monitoring and Modeling of Laser Additive

**Manufacturing with Titanium:** *James Craig*<sup>1</sup>; Tom Wakeman<sup>1</sup>; Shawn Kelly<sup>2</sup>; Richard Grylls<sup>3</sup>; <sup>1</sup>Stratronics, Inc.; <sup>2</sup>Penn State University, ARL; <sup>3</sup>Optomec, Inc.

### 10:20 AM

#### Thermodynamic Microstructure Modeling of Ti-6Al-4V Using Laser

**Deposition:** *Kurt Makiewicz*<sup>1</sup>; Sudarsanam Babu<sup>1</sup>; Anil Chaudhary<sup>2</sup>; Matt Keller<sup>2</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Applied Optimization

### 10:40 AM

#### Additive Manufacturing of Fe-17Cr-4Ni-4Cu, Comparing Build

**Chamber Process Gas with Mechanical Properties:** *Shane Collins*<sup>1</sup>; Francisco Medina<sup>1</sup>; Krista Amato<sup>1</sup>; Larry Murr<sup>1</sup>; Ryan Wicker<sup>1</sup>; Richard Alexander<sup>1</sup>; <sup>1</sup>Directed Manufacturing Inc.

### 11:00 AM

#### An Integrated Approach towards Estimation of Build Profile and

**Mechanical Properties in LENS® Deposit of H13 Tool Steel:** *Vinaya Manvatkar*<sup>1</sup>; Amol Gokhale<sup>2</sup>; Jagan G Reddy<sup>2</sup>; Amitava De<sup>1</sup>; <sup>1</sup>IIT Bombay; <sup>2</sup>DMRL, Hyderabad

### 11:20 AM

#### Mechanical Properties of Direct Laser Sintered Ti6Al4V:

*Hilda Chikwanda*<sup>1</sup>; *Makhabo Ramosoeu*<sup>2</sup>; Gerrie Booyesen<sup>2</sup>; T N Ngonda<sup>2</sup>; <sup>1</sup>Council for Scientific and Industrial Research (CSIR); <sup>2</sup>Central University of Technology, Free State (CUT)

## Advanced Developments in Electron Microscopy: Novel Microscopy Techniques

**Program Organizers:** Lawrence Allard, Oak Ridge National Laboratory; Velimir Radmilovic, Lawrence Berkeley National Laboratory; Paulo Ferreira, University of Texas at Austin; Daniel Ugarte, Universidade Estadual de Campinas - UNICAMP

Wednesday AM  
October 19, 2011

Room: E160A  
Location: Columbus Con. Center

*Session Chair:* Daniel Ugarte, Universidade Estadual de Campinas

### 8:00 AM Introductory Comments

### 8:20 AM Invited

#### Atomic Imaging of Surface and Bulk with an Aberration Corrected

**Scanning Electron Microscope:** *Yimei Zhu*<sup>1</sup>; <sup>1</sup>Brookhaven National Laboratory

### 9:00 AM Invited

#### Smart EFTEM-SI: A New Acquisition Procedure for Quantitative

**Elemental Imaging by Energy-Filtering TEM:** *Masashi Watanabe*<sup>1</sup>; Frances Allen<sup>2</sup>; <sup>1</sup>Lehigh University; <sup>2</sup>Lawrence Berkeley National Laboratory

### 9:40 AM Break

### 10:00 AM

#### Towards Even Higher Accuracy Electron Backscatter Diffraction:

*T Ben Britton*<sup>1</sup>; Jun Jiang<sup>1</sup>; Angus Wilkinson<sup>1</sup>; <sup>1</sup>Department of Materials, University of Oxford

### 10:20 AM

#### Diffraction Contrast STEM: Imaging and Simulations:

*Patrick Phillips*<sup>1</sup>; Michael Mills<sup>1</sup>; Marc De Graef<sup>2</sup>; <sup>1</sup>Ohio State University; <sup>2</sup>Carnegie Mellon University

### 10:40 AM Invited

#### Very Large Collection Angles Are Required to Limit Strain Contrast

**in Aberration-Corrected Z-Contrast STEM:** *Andrew Yankovich*<sup>1</sup>; *Paul Voyles*<sup>1</sup>; <sup>1</sup>University of Wisconsin, Madison

### 11:20 AM Invited

#### Dynamic TEM: Observing In Situ Reactions with Nanometer and

**Nanosecond Resolution:** *N. D. Browning*<sup>1</sup>; M. A. Bonds<sup>2</sup>; G. H. Campbell<sup>3</sup>; J. E. Evans<sup>4</sup>; K. L. Jungjohann<sup>2</sup>; J. McKeown<sup>3</sup>; T. LaGrange<sup>3</sup>; B. W. Reed<sup>3</sup>; M. Santala<sup>3</sup>; <sup>1</sup>Lawrence Livermore National Laboratory; and University of California-Davis, Department of Chemical Engineering and Materials Science, Department of Molecular and Cellular Biology; <sup>2</sup>University of California-Davis, Department of Chemical Engineering and Materials Science; <sup>3</sup>Lawrence Livermore National Laboratory; <sup>4</sup>University of California-Davis, Department of Molecular and Cellular Biology

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## Advanced Protective Coatings for Refractory Metals and Alloys: Strategies, Synthesis and Performance of Silicide Coatings

*Program Organizers:* Ridwan Sakidja, University of Wisconsin-Madison; Brian Cockeram, Bechtel-Bettis

Wednesday AM                      Room: D231  
October 19, 2011                      Location: Columbus Con. Center

*Funding support provided by:* WARF (Wisconsin Alumni Research Foundation)

*Session Chair:* Elizabeth Opila, University of Virginia

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### 8:00 AM Invited

**Coating Strategies to Improve the Oxidation Resistance of Bcc-Mo-Based Mo-Si-B Alloys:** *Mufit Akinci<sup>1</sup>*; Matthew Kramer<sup>1</sup>; Pratik Ray<sup>1</sup>; Zhihong Tang<sup>1</sup>; <sup>1</sup>Iowa State University

### 8:40 AM Invited

**High Temperature Oxidation Resistant Mo-Si-B Alloys and Coatings:** *John Perepezko<sup>1</sup>*; Ridwan Sakidja<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

### 9:20 AM

**Deposition of Silicide Based Protective Coatings on C-103 Niobium Alloy with Different Surface Microstructures:** *Kaiyang Wang<sup>1</sup>*; Jiandong Liang<sup>1</sup>; Li Wang<sup>1</sup>; S.M. Guo<sup>1</sup>; Shizhong Yang<sup>2</sup>; <sup>1</sup>Louisiana State University; <sup>2</sup>Southern University

### 9:40 AM Break

### 10:00 AM Invited

**Structural Formation and Oxidation Resistance of Si-Al-Y Co-Deposition Coatings on Nb-Ti-Si Based Multicomponent Ultrahigh Temperature Alloy:** *Xiping Guo<sup>1</sup>*; Chaofeng Zhang<sup>1</sup>; Ping Guan<sup>1</sup>; <sup>1</sup>Northwestern Polytechnical University

### 10:40 AM Invited

**Protective Coatings for Molybdenum – Industrial Processing and Applications:** *M. Kathrein<sup>1</sup>*; M. Sulik<sup>1</sup>; J. Januschewsky<sup>1</sup>; H. Kestler<sup>1</sup>; L.S. Sigl<sup>1</sup>; H. Larcher<sup>1</sup>; R. Holzknicht<sup>1</sup>; <sup>1</sup>Plansee SE

### 11:20 AM

**Oxidation Resistant Mo-Si-B Coatings on Tungsten for Ultra High Temperature Environmental Protection:** *Otto Lu-Steffes<sup>1</sup>*; Ridwan Sakidja<sup>1</sup>; John Perepezko<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

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## Advances in Dielectric Materials and Electronic Devices: Processing-Property-Microstructure Relationship

*Program Organizer:* K. M. Nair, E.I.duPont de Nemours & Co, Inc

Wednesday AM                      Room: C220  
October 19, 2011                      Location: Columbus Con. Center

*Session Chairs:* W Wong-Ng, NIST; D Uskokovic, Institute of Technical Service of the Serbian Academy of Science & Arts

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### 8:00 AM

**Controlling Microstructure by Influencing the Diffusive Processes during Sintering: Establishing a Tool Kit for Materials Design in PZT:** *Denis Schuetz<sup>1</sup>*; Florian Mittermayr<sup>1</sup>; Klaus Reichmann<sup>1</sup>; <sup>1</sup>Graz university of Technology

### 8:20 AM

**Influence of Thermal Stresses on the Dielectric Properties of Strontium Titanate Thin Films:** *Jialan Zhang<sup>1</sup>*; Claire Weiss<sup>1</sup>; S. Pamir Alpay<sup>1</sup>; Melanie Cole<sup>2</sup>; <sup>1</sup>Institute of Materials Science, University of Connecticut; <sup>2</sup>Army Research Laboratory

### 8:40 AM Invited

**Ionic Conductivity of Thin Film Electrolytes for Micro-Solid Oxide Fuel Cells:** *Enrico Traversa<sup>1</sup>*; <sup>1</sup>National Institute for Materials Science (NIMS)

### 9:00 AM

**Phase Formation, Texture Evolution and Enhanced Piezoelectric Properties in [001]-Textured SBN61 Piezoelectric Ceramics:** *Yunfei Chang<sup>1</sup>*; Soonil Lee<sup>1</sup>; Gary Messing<sup>1</sup>; <sup>1</sup>Pennsylvania State University

### 9:20 AM Invited

**Structural Characterization of Apatite-Type Rare-Earth Silicates:** *Rick Ubic<sup>1</sup>*; Lii-Cherng Leu<sup>1</sup>; Sherin Thomas<sup>2</sup>; Mailadil Sebastian<sup>2</sup>; Scott Mixture<sup>3</sup>; <sup>1</sup>Boise State University; <sup>2</sup>National Institute for Interdisciplinary Science and Technology; <sup>3</sup>Alfred University

### 9:40 AM Break

### 10:00 AM Invited

**Structure-Property Relationships of a New High Permittivity Perovskite: Ba<sub>2</sub>Bi<sub>1.4</sub>Nb<sub>0.6</sub>O<sub>6</sub>:** *Derek Sinclair<sup>1</sup>*; Chaou Tan<sup>1</sup>; Ian Reaney<sup>1</sup>; <sup>1</sup>University of Sheffield

### 10:20 AM Invited

**Structure and Characteristics of LuFeMgO<sub>4</sub> and LuFeCuO<sub>4</sub> Multiferroic Ceramics:** *Xiang Ming Chen<sup>1</sup>*; Ying Qin<sup>1</sup>; Xiao Qiang Liu<sup>1</sup>; <sup>1</sup>Zhejiang University

### 10:40 AM Invited

**The Microstructure Contact Surfaces Influence on BaTiO<sub>3</sub> Dielectric Properties:** *Vojislav Mitic<sup>1</sup>*; Slobodanka Jankovic<sup>2</sup>; Vesna Paunovic<sup>1</sup>; Vladimir Pavlovic<sup>3</sup>; Jelena Purenovic<sup>1</sup>; Ljiljana Zivkovic<sup>1</sup>; <sup>1</sup>University of Nis, Faculty of Electronic Engineering; <sup>2</sup>Institute of Mathematical Sciences, Serbian Academy of Sciences and Arts, Belgrade, Serbia; <sup>3</sup>Faculty of Agriculture, University of Belgrade, Belgrade, Serbia

### 11:00 AM

**Analysis of Grain and Grain Boundary Properties in Mn<sub>3</sub>O<sub>4</sub>-Doped CuO:** *Youn-Woo Hong<sup>1</sup>*; Jae-Ho Lee<sup>1</sup>; Hyo-Soon Shin<sup>1</sup>; Dong-Hun Yeo<sup>1</sup>; Joo-Ho Moon<sup>2</sup>; Jong-Hee Kim<sup>1</sup>; <sup>1</sup>Korea Institute of Ceramic Engineering & Technology; <sup>2</sup>Yonsei Univ.

### 11:20 AM Invited

**Young's Modulus and Poisson's Ratio on Piezoelectric Ceramics to Realize High Piezoelectricity:** *Toshio Ogawa<sup>1</sup>*; Takayuki Nishina<sup>1</sup>; Shizuoka Institute of Science and Technology

### 11:40 AM Invited

**Dielectric Properties of ZnTa<sub>2</sub>O<sub>6</sub> / Polypropylene Composites:** *Eung Soo Kim<sup>1</sup>*; Chang Jun Jeon<sup>1</sup>; <sup>1</sup>Kyonggi University

### 12:00 PM

**Effect of Nanocrystalline Diamond Deposition Conditions on Si MOSFET Device Characteristics:** *Nirmal Govindaraju<sup>1</sup>*; Peter Kosel<sup>1</sup>; Raj Singh<sup>1</sup>; <sup>1</sup>University of Cincinnati

## Advances in Manufacturing Technologies: Advanced Manufacturing Techniques

Program Organizer: Muammer Koc, Istanbul Sehir University

Wednesday AM  
October 19, 2011

Room: D144/145  
Location: Columbus Con. Center

Session Chair: Muammer Koc, Istanbul Sehir University

### 8:00 AM

**A Study on Mechanical Properties of Localized Electro-Chemically Deposited (LECD) Structures:** *Rehan Arif<sup>1</sup>; Mustafizur Rahman<sup>1</sup>; Mohammad Habib<sup>2</sup>; <sup>1</sup>National University of Singapore; <sup>2</sup>Islamic University of Technology*

### 8:20 AM

**HED Processing for Coating Applications:** *Greg Engleman<sup>1</sup>; Joshua Caris<sup>1</sup>; Andrew Sherman<sup>1</sup>; Mario Medanic<sup>1</sup>; <sup>1</sup>MesoCoat*

### 8:40 AM

**High-Frequency Vibration Assisted Micro/Meso-Scale Metal Forming of Aluminum:** *Zhehe Yao<sup>1</sup>; Gap-Yong Kim<sup>2</sup>; LeAnn Faidley<sup>2</sup>; Qingze Zou<sup>3</sup>; Deqing Mei<sup>1</sup>; Zichen Chen<sup>1</sup>; <sup>1</sup>Zhejiang University; <sup>2</sup>Iowa State University; <sup>3</sup>Rutgers University*

### 9:00 AM

**Influence of Strain and Strain Rate on Abnormal Grain Growth during Superplasticity of AZ31 Sheets:** *Arun Mohan<sup>1</sup>; Rajiv Mishra<sup>1</sup>; Ravi Verma<sup>2</sup>; <sup>1</sup>Missouri University of Science and Technology; <sup>2</sup>General Motors R&D Center*

### 9:40 AM Break

### 10:00 AM

**High Performance Product and Process Tracking Techniques:** *Edward S. O'Neal<sup>1</sup>; <sup>1</sup>InfoSight Corporation*

### 10:20 AM

**Manufacturing Controls for the Fabrication of Tissue Scaffolds with Graded Microstructures:** *David Hoelzle<sup>1</sup>; Andrew Alleyne<sup>1</sup>; Amy Wagoner Johnson<sup>1</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign*

### 10:40 AM

**Manufacturing Fuel Cell Bipolar Plates by Electromagnetic Forming:** *Jianhui Shang<sup>1</sup>; Larry Wilkerson<sup>1</sup>; Steve Hatkevich<sup>1</sup>; <sup>1</sup>American Trim LLC*

### 11:00 AM

**Structural Optimization of the Baffle Design inside the Mg Twin Roll Strip Casting Nozzle:** *Deok Kim<sup>1</sup>; Jaesin Park<sup>1</sup>; Jae Joong Kim<sup>1</sup>; Dongkyun Choo<sup>1</sup>; <sup>1</sup>RIST(Research Institute of Industrial Science and Technology)*

### 11:20 AM

**Investigations of Micro-Scale Surface Interactions and Tribological Size Effect in Microstamping of SS316L Sheets:** *Mevlüt Peker<sup>1</sup>; Ömer Cora<sup>1</sup>; Muammer Koç<sup>1</sup>; <sup>1</sup>Virginia Commonwealth University*

### 11:40 AM

**Extrusion of Thin-Wall Multi-Channel Copper Profiles:** *Frank Kraft<sup>1</sup>; <sup>1</sup>Ohio University*

## Amorphous Materials: Common Issues within Science and Technology: Glass in 21st Century

Program Organizer: Pierre Lucas, University of Arizona

Wednesday AM  
October 19, 2011

Room: C211  
Location: Columbus Con. Center

Session Chair: Mario Affatigato, Coe College

### 8:00 AM

**Glass and Glass-Ceramic Technologies to Transform The World:** *Larry Hench<sup>1</sup>; <sup>1</sup>University of Florida*

### 8:40 AM

**The Past, Present, and Future of Chemically Strengthened Glass:** *Matthew Dejneka<sup>1</sup>; <sup>1</sup>Corning Incorporated*

### 9:20 AM

**New Studies of Ionic Conduction in Glass: The Mixed Glass Former Effect in Sodium Borosilicate Glasses:** *Steve W. Martin<sup>1</sup>; Randi Christensen<sup>1</sup>; Garrett Olson<sup>1</sup>; <sup>1</sup>Iowa State University*

### 9:40 AM Break

### 10:00 AM

**Rare-Earth Doped Multi-Component Glass Fibers for Fiber Lasers:** *Shibin Jiang<sup>1</sup>; <sup>1</sup>AdValue Photonics Inc*

### 10:40 AM

**Multi-Scale Processing of Chalcogenides:** *S. Sundaram<sup>1</sup>; Brian Riley<sup>2</sup>; Bradley Johnson<sup>2</sup>; <sup>1</sup>Alfred University; <sup>2</sup>Pacific Northwest National Laboratory*

### 11:20 AM

**The Effects of Lithia and Alumina on the Viscosity and Strength of Commercial Fiberglass and Glass Compositions:** *Frederick Wallenberger<sup>1</sup>; <sup>1</sup>retired*

### 12:00 PM

**Chalcogenide glasses for the 21st Century: a prospective for new mid-infrared medical endoscopy:** *Angela Seddon<sup>1</sup>; <sup>1</sup>University of Nottingham*

## Ceramic Matrix Composites: Processing/Fabrication

Program Organizers: Narottam Bansal, NASA Glenn Research Center; J. P. Singh, U.S. Army Research Laboratory; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Wednesday AM  
October 19, 2011

Room: C112  
Location: Columbus Con. Center

Session Chair: Bernhard Heidenreich, DLR

### 8:00 AM Invited

**Manufacture and Applications of C/C-SiC and C/SiC Composites:** *Bernhard Heidenreich<sup>1</sup>; <sup>1</sup>DLR*

### 8:40 AM

**Utilizing Pressure-Induced Transformations for Toughening of Ceramics:** *Subramanian Ramalingam<sup>1</sup>; Corinne Packard<sup>1</sup>; Ivar Reimanis<sup>1</sup>; <sup>1</sup>Colorado School of Mines*

### 9:00 AM

**Horizontal Dip-Spin Casting for the Fabrication of Ceramic Composites with Aligned Strengthening Phases:** *Manuel Acosta<sup>1</sup>; Rodney Trice<sup>1</sup>; Jeffrey Youngblood<sup>1</sup>; <sup>1</sup>Purdue University School of Materials Engineering*

**9:20 AM Break**

**9:40 AM**

**Controlled Volume Fraction  $\text{Si}_3\text{N}_4/\text{SiC}$  Composites from Polymer Derived Ceramics:** *Kevin Strong*<sup>1</sup>; Raj Bordia<sup>1</sup>; <sup>1</sup>University of Washington

**10:00 AM**

**Rare Earth Modified Matrices for SiC Matrix Composites:** *David Poerschke*<sup>1</sup>; Carlos Levi<sup>1</sup>; <sup>1</sup>University of California Santa Barbara

**10:20 AM**

**Computer Models of T-x-y Diagrams to Design the Ceramic Materials:** *Vasily Lutsyk*<sup>1</sup>; Ann Zelenaya<sup>2</sup>; <sup>1</sup>Buryat State University; <sup>2</sup>Institute of Physical Materials Science

**10:40 AM**

**Comparative Study of Multi-Materials during Microwave and Conventional Sintering:** *Saunier Sébastien*<sup>1</sup>; François Valdivieso<sup>1</sup>; Benjamin Desplanques<sup>1</sup>; Dominique Goeuriot<sup>1</sup>; Daniel Zymelka<sup>1</sup>; <sup>1</sup>Ecole des Mines de Saint-Etienne

**11:00 AM**

**Effect of Particle Size and Temperature on the Sintering Behaviour of Glass Compacts:** *Adele Garkida*<sup>1</sup>; Jiann-Yang Hwang<sup>2</sup>; Xiaodi Huang<sup>2</sup>; Allison Hein<sup>2</sup>; <sup>1</sup>Ahmadu Bello University; <sup>2</sup>Michigan Technological University

**11:20 AM**

**Kinetics of Formation of  $\zeta\text{-Ta}_4\text{C}_{3-x}$  by Reaction of Ta and TaC Powders:** *Michael Sygnatowicz*<sup>1</sup>; Raymond Cutler<sup>1</sup>; Dinesh Shetty<sup>1</sup>; <sup>1</sup>University of Utah

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**Characterization and Modeling of the Performance of Advanced Alloys for the Transportation Industry -- Bridging the Data Gap II: Evaluating the Performance of Advanced Lightweight Alloys I**

*Program Organizers:* Mark Stoudt, National Institute of Standards and Technology; Adam Creuziger, National Institute of Standards and Technology; John Carsley, General Motors; Michael Miles, BYU; Kip Findley, Colorado School of Mines

Wednesday AM  
October 19, 2011

Room: D131  
Location: Columbus Con. Center

*Session Chair:* John Carsley, General Motors R&D

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**8:00 AM Invited**

**The Shear Fracture of Dual-Phase Steels:** *Robert Wagoner*<sup>1</sup>; Ji Hoon Kim<sup>2</sup>; Ji Hyun Sung<sup>3</sup>; <sup>1</sup>Ohio State University; <sup>2</sup>Korea Institute of Materials Science; <sup>3</sup>Korea Institute of Industrial Technology

**8:40 AM**

**The Characterization of Unloading after Plastic Deformation:** *Chester Van Tyne*<sup>1</sup>; Bernard Levy<sup>2</sup>; <sup>1</sup>Colorado School of Mines; <sup>2</sup>BS Levy Consultants

**9:00 AM**

**Modeling the Deformation Texture in Transformation-Induced Plasticity (TRIP) Steels under Multiaxial Loads:** *Lin Hu*<sup>1</sup>; Adam Creuziger<sup>2</sup>; Thomas Gnaeupel-Herold<sup>2</sup>; Anthony Rollett<sup>1</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>National Institute of Standards and Technology

**9:20 AM**

**Time-Dependent Springback of Advanced High Strength Steels:** *Hojun Lim*<sup>1</sup>; Myoung-Gyu Lee<sup>2</sup>; Ji Hyun Sung<sup>3</sup>; Ji Hoon Kim<sup>4</sup>; Robert Wagoner<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Pohang University of Science and Technology; <sup>3</sup>Korea Institute of Industrial Technology; <sup>4</sup>Korea Institute of Materials Science

**9:40 AM Break**

**10:00 AM Invited**

**Measuring Evolving Multiaxial Yield Surfaces - Is There a Best Way to Go at It?:** *Tim Foecke*<sup>1</sup>; <sup>1</sup>NIST

**10:40 AM**

**Yield Surface Evolution in HSLA Steel:** *Adam Creuziger*<sup>1</sup>; Mark Iadicola<sup>1</sup>; Thomas Gnaeupel-Herold<sup>1</sup>; <sup>1</sup>National Institute of Standards and Technology

**11:00 AM**

**Instrumented Hole Expansion Testing of Advanced High Strength Steels:** *Christian Krempaszky*<sup>1</sup>; Andreas Mackensen<sup>2</sup>; Hartmut Hoffmann<sup>2</sup>; Ewald Werner<sup>3</sup>; Erich Spindler<sup>4</sup>; <sup>1</sup>CD Laboratory of Material Mechanics of High Performance Alloys, TU-Munich; <sup>2</sup>Institute of Metal Forming and Casting; <sup>3</sup>Institute of Materials Science and Mechanics of Materials, TU München; <sup>4</sup>TU-München

**11:20 AM**

**Pneumatic Stretching through Open Die Inserts for Constructing the FLDs of Lightweight Alloys at Elevated Temperatures:** *Fadi Abu-Farha*<sup>1</sup>; Louis Hector<sup>2</sup>; John Curtin<sup>1</sup>; Nickolas Snyder<sup>1</sup>; <sup>1</sup>Penn State Erie; <sup>2</sup>General Motors R&D Center

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**Controlled Synthesis, Processing and Applications of Structural and Functional Nanomaterials: Two Dimensional Nanomaterials**

*Program Organizers:* Kathy Lu, Virginia Tech; Xudong Wang, University of Wisconsin - Madison; Eugene Olevsky, San Diego State University; Gurpreet Singh, Kansas State University; Nitin Chopra, The University of Alabama; Pu-Xian Gao, University of Connecticut; Jianyu Liang, Worcester Polytechnic Institute

Wednesday AM  
October 19, 2011

Room: C123  
Location: Columbus Con. Center

*Session Chair:* Pu-xian Gao, University of Connecticut

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**8:00 AM Invited**

**Optical Thin Films for Gas Sensing in Advanced Coal Fired Power Plants:** *Paul Ohodnicki*<sup>1</sup>; Thomas Brown<sup>1</sup>; Congjun Wang<sup>1</sup>; Christopher Matrangola<sup>1</sup>; <sup>1</sup>National Energy Technology Laboratory

**8:40 AM**

**Large-Scale Synthesis of MoS<sub>2</sub>/ Polymer Derived Ceramic Composite Nanosheets:** *Lamuel David*<sup>1</sup>; Romil Bhandavat<sup>1</sup>; Uriel Barrera<sup>1</sup>; Gurpreet Singh<sup>1</sup>; <sup>1</sup>Kansas State University

**9:00 AM**

**Silicon Nitride Nanowire Papers Synthesized by Silica Nanopowders and Silica Gel:** *Kei-Peng Jen*<sup>1</sup>; Sridhar Santhanam<sup>1</sup>; Jih Guo<sup>1</sup>; <sup>1</sup>Villanova University

**9:20 AM**

**Synthesis of Nano-Structured Metal-Oxides and Deposition via Ink-Jet Printing on Microhotplate Substrates for Applications in Gas Sensing:** *Mark Andio*<sup>1</sup>; Patricia Morris<sup>1</sup>; <sup>1</sup>Ohio State University

**9:40 AM Break**

**10:00 AM Invited**

**Toward More Efficient Photocathode for Dye-Sensitized Solar Cells:** *Yiyi Wu*<sup>1</sup>; <sup>1</sup>Ohio State University

**10:40 AM Invited**

**Application of ZnO Nanowires for Energy Harvesting Technology:** *Rusen Yang*<sup>1</sup>; <sup>1</sup>University of Minnesota

11:20 AM

**TiO<sub>2</sub> Photocatalyst Thin Film Coatings on Polyethylene Terephthalate:** *Huynh Pham*<sup>1</sup>; Charles Sorrell<sup>1</sup>; Julian Cox<sup>1</sup>; <sup>1</sup>The University of New South Wales

11:40 AM

**Magnetic Response and Nano-Structural Variations of Ni, Co, and Fe-Doped Y<sub>2</sub>O<sub>3</sub>-Stabilized ZrO<sub>2</sub>:** *Amy Morrissey*<sup>1</sup>; Josh White<sup>1</sup>; Jianhua Tong<sup>1</sup>; Jim O'Brien<sup>2</sup>; Ivar Reimanis<sup>1</sup>; <sup>1</sup>Colorado School of Mines; <sup>2</sup>Quantum Design, Inc.

## Corrosion Protection through Metallic and Non-Metallic Coatings: Mechanisms and Evaluation

**Program Organizers:** Narasi Sridhar, DNV; Rudolph Buchheit, Ohio State University

Wednesday AM  
October 19, 2011

Room: D244/245  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

8:00 AM

**Insight in the Corrosion Mechanism and Designing of Corrosion Protection Coatings for the Replacement of Hexavalent Chromium-Based Surface Treatments for Mg-Y-RE-Zr Alloy:** *HELENE ARDELEAN*<sup>1</sup>; <sup>1</sup>ENSCP CNRS UMR7045

8:20 AM

**Effects of Surface Treatments on Adhesion Strength of Coated AA2024-T3 Using the Blister Test:** *Brendy Rincon Troconis*<sup>1</sup>; Gerald Frankel<sup>1</sup>; <sup>1</sup>The Ohio State University

8:40 AM

**Corrosion Protection Mechanisms of Coatings with Rare-Earth Based Inhibitors:** *William Fahrenholtz*<sup>1</sup>; Matthew O'Keefe<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology

9:00 AM

**Degradation of Coating Adhesion Measured by AFM Scratching:** *Jinwook Seong*<sup>1</sup>; Gerald Frankel<sup>1</sup>; <sup>1</sup>Fontana Corrosion Center

9:20 AM

**Cr Based Alloy Cr-Y Oxidation Study from First Principles Molecular Dynamics Simulation:** *Lei Zhao*<sup>1</sup>; Shizhong Yang<sup>1</sup>; Ebrahim Khosravi<sup>1</sup>; Shengmin Guo<sup>2</sup>; <sup>1</sup>Southern University and A&M College; <sup>2</sup>Louisiana State University

9:40 AM Break

10:10 AM

**Study on High Temperature Oxidation of Y Doped Nb<sub>2</sub>AlC (MAX Phase) From Ab Initio Molecular Dynamics Simulation** *Initio Molecular Dynamics Simulation:* *Shizhong Yang*<sup>1</sup>; Lei Zhao<sup>1</sup>; Ebrahim Khosravi<sup>1</sup>; Kaiyang Wang<sup>2</sup>; Shengmin Guo<sup>2</sup>; <sup>1</sup>Southern University and A&M College; <sup>2</sup>Louisiana State University

10:30 AM

**Study of the Effect of Hot Corrosion and Role of Coatings in Waste-to-Energy (WTE) Plant Environment: A Review:** *Harminder Singh*<sup>1</sup>; T.S Sidhu<sup>2</sup>; Sukhminderbir Singh Kalsi<sup>3</sup>; <sup>1</sup>Guru Nanak Dev University, Regional Campus, Jalandhar, Punjab, India; <sup>2</sup>Shaheed Bhagat Singh College of Engineering and Technology, Ferozepur, Punjab, India; <sup>3</sup>Amritsar College of Engineering & Technology, Amritsar, Punjab, India

10:50 AM

**Study of the Crystalline Phases on the Oxide Layer of Cerium Conversion Coatings:** *Ci Lin*<sup>1</sup>; William Fahrenholtz<sup>1</sup>; Surender Maddela<sup>1</sup>; Matthew O'Keefe<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology

## Deformation and Transitions at Grain Boundaries: Deformation Effects at Grain Boundaries

**Program Organizers:** Thomas Bieler, Michigan State University; Douglas Spearot, University of Arkansas; Rozaliya Barabash, Oak Ridge National Laboratory; Shen Dillon, University of Illinois at Urbana-Champaign; Jian Luo, Clemson University

Wednesday AM  
October 19, 2011

Room: C121  
Location: Columbus Con. Center

*Session Chairs:* Marek Niewczas, McMaster University; John Budai, Oak Ridge National Laboratory

8:00 AM

**Multi-Scale Deformation Analysis of Grain Boundary Interactions in Nickel-Based Superalloys:** *Jennifer Carter*<sup>1</sup>; Michael Uchic<sup>2</sup>; Robert Wheeler<sup>3</sup>; Michael Mills<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Air Force Research Laboratory, Materials & Manufacturing Directorate, AFRL/RXLM; <sup>3</sup>UES, Inc.

8:20 AM

**Investigation of the Impact of Size Effects and Confined Plasticity on Stacking Fault Widths Using 3D Phase Field Dislocation Dynamics (PFDD) Simulations:** *Abigail Hunter*<sup>1</sup>; Irene Beyerlein<sup>1</sup>; Timothy Germann<sup>1</sup>; Marisol Koslowski<sup>2</sup>; <sup>1</sup>Los Alamos National Laboratory; <sup>2</sup>Purdue University

8:40 AM Invited

**Hot Spots and Grain Boundaries:** *Anthony Rollett*<sup>1</sup>; David Field<sup>2</sup>; Francis Wagner<sup>3</sup>; Robert Suter<sup>1</sup>; Ricardo Lebensohn<sup>4</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>washington state univ.; <sup>3</sup>Metz Univ.; <sup>4</sup>Los Alamos National Lab.

9:00 AM

**Analysis of Slip and Grain Boundary Activities of Ti-5Al-2.5Sn(wt.%) Deformed In-Situ at Elevated Temperature:** *Hongmei Li*<sup>1</sup>; Carl Boehlert<sup>1</sup>; Thomas Bieler<sup>1</sup>; Martin Crimp<sup>1</sup>; <sup>1</sup>Michigan State University

9:20 AM

**Study of Microstructure in Cold-Rolled and Recrystallized Al-Si Composites Reinforced with Diboride Particles:** *Cynthia Mercado*<sup>1</sup>; Natalia Cortés<sup>1</sup>; O. Marcelo Suárez<sup>1</sup>; <sup>1</sup>University of Puerto Rico

9:40 AM Break

10:00 AM Invited

**Σ3 Interfaces as Barriers to Motion of Dislocations, Electrons and Recrystallization Fronts:** *Marek Niewczas*<sup>1</sup>; <sup>1</sup>McMaster University

10:20 AM Invited

**Studying Grain Boundary Regions in Polycrystalline Materials Using Spherical Nano-Indentation and Orientation Imaging Microscopy:** *Surya Kalidindi*<sup>1</sup>; Siddhartha Pathak<sup>2</sup>; Shraddha Vachhani<sup>1</sup>; <sup>1</sup>Drexel University; <sup>2</sup>California Institute of Technology

10:40 AM Invited

**Transition of Lath Martensite to Cell Blocks during Cold-Rolling of Interstitial Free (IF) Steel:** *Niels Hansen*<sup>1</sup>; Xiaoxu Huang<sup>1</sup>; Shigekazu Morito<sup>1</sup>; <sup>1</sup>Risø National Laboratory for Sustainable Energy, Technical University of Denmark



**11:00 AM**

**Modeling of Experimentally Measured Failure Initiation Using a State-of-the-art FFT Algorithm:** *Reeju Pokharell<sup>1</sup>; Anthony Rollett<sup>1</sup>; S.F. Li<sup>1</sup>; Jon Lind<sup>1</sup>; Chris Hefferan<sup>1</sup>; Robert Suter<sup>1</sup>; Ulrich Lienert<sup>2</sup>; <sup>1</sup>CMU; <sup>2</sup>Argonne National Laboratory*

**11:20 AM Invited**

**A Study on Plastic Deformation and Crack Growth Mechanisms of a Wrought Magnesium Alloy AZ31B:** *Wei Wu<sup>1</sup>; Soo Yeol Lee<sup>2</sup>; E-Wen Huang<sup>3</sup>; Anna Paradowska<sup>4</sup>; Rozaliya Barabash<sup>5</sup>; Peter Liaw<sup>1</sup>; <sup>1</sup>The University of Tennessee; <sup>2</sup>The University of British Columbia, National Research Council Canada; <sup>3</sup>National Central University; <sup>4</sup>Rutherford Appleton Laboratory; <sup>5</sup>Oak Ridge Natl Lab, The University of Tennessee*

**11:40 AM**

**Observation of a Fractured Surface Due to Fully Time Dependent Intergranular Crack Growth Using X-ray Tomography and High Energy X-ray Diffraction Microscopy:** *J. Lind<sup>1</sup>; S. Li<sup>1</sup>; C. Hefferan<sup>1</sup>; R. Pokharell<sup>2</sup>; A. Rollett<sup>2</sup>; P. Kenesei<sup>3</sup>; U. Lienert<sup>3</sup>; R. Suter<sup>1</sup>; <sup>1</sup>Carnegie Mellon University, Department of Physics; <sup>2</sup>Carnegie Mellon University, Department of Materials Science & Engineering; <sup>3</sup>Argonne National Laboratory, Advanced Photon Source*

**Energy Conversion/Fuel Cells: Electrode Materials**

*Program Organizers:* Matthew Seabaugh, NexTech Materials, Ltd.; Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Meilin Liu, Georgia Institute of Technology

Wednesday AM  
October 19, 2011

Room: C224  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

**8:00 AM**

**Electrical, Mechanical and Thermal Expansion Characterization of Strontium Titanate-Based Materials for Solid Oxide Fuel Cells:** *Jong-Won Lee<sup>1</sup>; Beom-Kyeong Park<sup>1</sup>; Seung-Bok Lee<sup>1</sup>; Tak-Hyoung Lim<sup>1</sup>; Seok-Joo Park<sup>1</sup>; Rak-Hyun Song<sup>1</sup>; Dong-Ryul Shin<sup>1</sup>; <sup>1</sup>Korea Institute of Energy Research*

**8:20 AM**

**PH3 Removal by Means of Prefilter for Ni-YSZ Anode-Supported SOFC:** *Chunchuan Xu<sup>1</sup>; John Zondlo<sup>1</sup>; Edward Sabolsky<sup>1</sup>; <sup>1</sup>West Virginia University*

**8:40 AM**

**Study of the Behaviour of LSCM Anode Composites in a Segmented Planar Solid Oxide Fuel Cell:** *Mark Cassidy<sup>1</sup>; Samir Bouffrad<sup>2</sup>; Patrick Muhl<sup>1</sup>; John Irvine<sup>1</sup>; <sup>1</sup>University of St Andrews; <sup>2</sup>King Abdullah University of Science and Technology*

**9:00 AM**

**First-Principles Prediction of Oxygen States and Transportation in Liquid Tin Anode SOFC:** *Michael Gao<sup>1</sup>; Michael Widom<sup>2</sup>; Yves Mantz<sup>1</sup>; Kirk Gerdes<sup>1</sup>; James Lill<sup>3</sup>; <sup>1</sup>NETL; <sup>2</sup>Carnegie Mellon University; <sup>3</sup>High Performance Technologies, Inc.*

**9:20 AM**

**High-Performance SOFC Anodes Prepared by Infiltration of Strontium Molybdate into Porous YSZ:** *Michael Gross<sup>1</sup>; Brandon Smith<sup>1</sup>; <sup>1</sup>Bucknell University*

**9:40 AM Break****10:00 AM**

**Influence of Pore Former Loadings on Anode Microstructures for High Performance SOFCs:** *Ayhan Sarikaya<sup>1</sup>; Vladimir Petrovsky<sup>1</sup>; Fatih Dogan<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology*

**10:20 AM**

**Investigation of the Mechanisms of Air Electrode Delamination in Solid Oxide Electrolysis Cells:** *Michael Keane<sup>1</sup>; Prabhakar Singh<sup>1</sup>; Atul Verma<sup>1</sup>; <sup>1</sup>University of Connecticut*

**10:40 AM**

**First Principles Calculations of Oxygen Incorporation into SOFC Cathode Materials:** *Eugene Kotomin<sup>1</sup>; Rotraut Merkle<sup>2</sup>; Yuri Mastrikov<sup>3</sup>; Maija Kuklja<sup>4</sup>; Joachim Maier<sup>2</sup>; <sup>1</sup>Max Planck Institute; <sup>2</sup>Max Planck Institute; <sup>3</sup>University of Maryland; <sup>4</sup>University of Maryland*

**11:00 AM**

**Performance and Stability of SOFC Composite Cathodes:** *Anh Duong<sup>1</sup>; Daniel Mumm<sup>1</sup>; <sup>1</sup>UC Irvine*

**11:20 AM**

**Phase-Field Modeling of Microstructural Evolution of SOFC Cathode:** *Qun Li<sup>1</sup>; Long-Qing Chen<sup>1</sup>; <sup>1</sup>PSU*

**11:40 AM**

**Observations on the Chemical and Structural Modifications in  $\text{La}_{0.8}\text{Sr}_{0.2}\text{MnO}_{3.177/948}$  (LSM) – 8mol% yttria Stabilized Zirconia (YSZ) Composite during Sintering:** *Na Li<sup>1</sup>; Manoj Mahapatra<sup>1</sup>; Prabhakar Singh<sup>1</sup>; <sup>1</sup>Uconn*

**Energy Storage: Materials, Systems and Applications: Na-Batteries**

*Program Organizers:* Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Terry Holesinger, Los Alamos National Laboratory; Xingbo Liu, West Virginia University; Chun Lu, Siemens Energy, Inc.

Wednesday AM  
October 19, 2011

Room: C223  
Location: Columbus Con. Center

*Session Chairs:* Leon Shaw, University of Connecticut; Jeffrey Fergus, Auburn University

**8:00 AM Invited**

**Planar Sodium Metal Halide Battery for Renewable Integration and Grid Applications:** *John P. Lemmon<sup>1</sup>; Xiaochuan Lu<sup>1</sup>; Guosheng Li<sup>1</sup>; Gary Z. Yang<sup>1</sup>; <sup>1</sup>Pacific Northwest National Laboratory*

**8:40 AM Cancelled**

**Energy Applications Enhanced by Nanomaterials:** *Randy Vander Wall<sup>1</sup>; <sup>1</sup>Penn State University*

**9:00 AM Invited**

**Development of Low-Temperature Molten Na Batteries with NaSICON Ceramics:** *Chett Boxley<sup>1</sup>; Matthew Robins<sup>1</sup>; Grover Coors<sup>1</sup>; Jeongsoo Kim<sup>2</sup>; Youngshol Kim<sup>2</sup>; Jehyun Chae<sup>2</sup>; <sup>1</sup>Ceramtec; <sup>2</sup>SK Innovation/ Advanced Battery Development Team*

**9:40 AM Break****10:00 AM Invited**

**Development of Sodium-Based Secondary Batteries for Energy Storage:** *Anil Virkar<sup>1</sup>; Greg Tao<sup>2</sup>; Joonho Koh<sup>2</sup>; Neill Weber<sup>2</sup>; <sup>1</sup>University of Utah; <sup>2</sup>Materials and Systems Research, Inc.*

**10:40 AM Invited**

**The Promise of Low Cost Bulk Energy Storage: Aqueous Electrolyte Asymmetric/Hybrid Electrochemical Devices:** *Jay Whitacre<sup>1</sup>; <sup>1</sup>CMU*

**11:20 AM**

**NASICON-Type Electrolytes for Low Temperature Sodium Battery Applications:** *Hui Zhang<sup>1</sup>; Xingbo Liu<sup>1</sup>; <sup>1</sup>West Virginia University*

11:40 AM

**Physical and Electrochemical Properties of Ionic Liquids for Na-Based Batteries:** *Jack Shamie*<sup>1</sup>; Leon Shaw<sup>1</sup>; <sup>1</sup>University of Connecticut

## Environmentally Assisted Cracking of Materials: Session IV

*Program Organizers:* Ramgopal Thodla, DNV Columbus; Suresh Divi, TIMET

Wednesday AM  
October 19, 2011

Room: D233  
Location: Columbus Con. Center

*Session Chair:* Ramgopal Thodla, DNV Columbus

8:00 AM

**Environmental Conditions Influencing the Hydrogen Embrittlement of Titanium Alloys:** *Suresh Divi*<sup>1</sup>; <sup>1</sup>TIMET

8:20 AM

**Fine Scale Microstructure Evolution of Al-5083 Sensitized at 70C and 100C and Effect on Corrosion Fatigue:** *Ronald Holtz*<sup>1</sup>; Ramasis Goswami<sup>2</sup>; Peter Pao<sup>1</sup>; Robert Bayles<sup>1</sup>; Thomas Longazel<sup>1</sup>; <sup>1</sup>Naval Research Laboratory; <sup>2</sup>SAIC

8:40 AM

**The Effect of Zn-Rich Coatings on the Environmentally Assisted Fracture Performance of High Strength Armor Steel:** *Michelle Koul*<sup>1</sup>; Andrew Sheetz<sup>2</sup>; Pete Ault<sup>3</sup>; John Repp<sup>3</sup>; Angela Whitfield<sup>2</sup>; <sup>1</sup>USNA; <sup>2</sup>NSWC Carderock Division; <sup>3</sup>Elzly Technology Corporation

9:00 AM

**Environmentally Assisted Cracking of Alloy 7050-T7451 Exposed to Aqueous Chloride Solutions:** *Reinhold Braun*<sup>1</sup>; <sup>1</sup>DLR - German Aerospace Center

9:20 AM

**Environmentally Assisted Cracking of Carbon Steel in High Temperature Geothermal Well:** *Sigrun Karlsdottir*<sup>1</sup>; Ingolfur Thorbjornsson<sup>1</sup>; <sup>1</sup>Innovation Center Iceland

9:40 AM Break

10:00 AM

**Evaluation of Thiosulfate as a Substitute for H<sub>2</sub>S in Sour Corrosion Fatigue Studies:** *mariano kappes*<sup>1</sup>; Gerald Frankel<sup>1</sup>; Narasi Sridhar<sup>2</sup>; Ramgopal Thodla<sup>2</sup>; Ricardo Carranza<sup>3</sup>; <sup>1</sup>ohio state university; <sup>2</sup>DNV Columbus; <sup>3</sup>CNEA Argentina

10:20 AM

**Fatigue Life of Superalloy Haynes 188 in Hydrogen:** *Tim Gabb*<sup>1</sup>; Gregg Ribeiro<sup>2</sup>; Henry Webster<sup>2</sup>; Tim Gorman<sup>3</sup>; John Gayda<sup>1</sup>; <sup>1</sup>NASA Glenn Research Center; <sup>2</sup>ATK; <sup>3</sup>University of Dayton

10:40 AM

**Gaseous Hydrogen-Assisted Fatigue Crack Growth in X52 Linepipe Steel:** *Brian Somerday*<sup>1</sup>; Chris San Marchi<sup>1</sup>; Kevin Nibur<sup>2</sup>; <sup>1</sup>Sandia National Laboratories; <sup>2</sup>Hy-Performance Testing

11:00 AM

**Evaluation of the Susceptibility to Hydrogen Assisted Cracking in Dissimilar Metal Welds :** *Boian Alexandrov*<sup>1</sup>; Shu Shi<sup>2</sup>; Jeffrey Rodelas<sup>1</sup>; John Lippold<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Shell Exploration & Production Company

11:20 AM

**Environmental Effects on Fatigue Crack Growth Rates in Sour Environments:** *Ramgopal Thodla*<sup>1</sup>; Feng Gui<sup>1</sup>; Martin Mueller<sup>1</sup>; David Cole<sup>1</sup>; <sup>1</sup>DNV

## Failure Analysis and Prevention: Aerospace

*Program Organizers:* Andrew Spowage, The University of Nottingham, Malaysia Campus; Tom Ackerson, IMR Metallurgical Services; Larry Hanke, Materials Evaluation and Engineering, Inc

Wednesday AM  
October 19, 2011

Room: D235  
Location: Columbus Con. Center

*Session Chairs:* Wesley Pridemore, GE Aviation; Daniel Dennies, Engineering Systems, Inc.; Dale Alexander, Engineering Systems, Inc.

8:00 AM

**Fatigue In the Aerospace Industry – Know Your Part:** *Nicholas Cherolis*<sup>1</sup>; <sup>1</sup>Rolls-Royce Corporation

8:20 AM

**Metallurgical Evaluation of Fractured High Pressure Turbine Forward Outer Seal (FOS) from Aircraft Jet Engine:** *Wesley Pridemore*<sup>1</sup>; Ron Duvelius<sup>1</sup>; <sup>1</sup>GE-Aviation

8:40 AM

**Failure Analysis of a Wing Attachment Bolt:** *Jeff Calcaterra*<sup>1</sup>; <sup>1</sup>Air Force Research Lab

9:00 AM

**Metallurgical Failure Analysis of Aircraft Structure: Interesting Case Studies from Teardown:** *Saravanan Arunachalam*<sup>1</sup>; <sup>1</sup>US Air Force Academy

9:20 AM

**The Effect of Elevated Temperature Exposure on Cracking of Ti-6Al-2Sn-4Zr-2Mo:** *Adam Pilchak*<sup>1</sup>; W. Porter<sup>2</sup>; Reji John<sup>1</sup>; <sup>1</sup>Air Force Research Laboratory; <sup>2</sup>University of Dayton Research Institute

9:40 AM Break

10:00 AM

**Crash of G-ILGW – Wear of Torsional Vibration Dampers:** *Cyrille Moore*<sup>1</sup>; Harri Kytomaa<sup>1</sup>; <sup>1</sup>Exponent

10:20 AM

**SEM/EDS Assessment of Fractured Gas Turbine Engine Hot Section Components:** *Roch Shipley*<sup>1</sup>; <sup>1</sup>ProAaCI

10:40 AM

**Turbine Shroud Cracking Investigation and Repair:** *Tomasz Didenko*<sup>1</sup>; Marcin Zak<sup>1</sup>; <sup>1</sup>GE Aviation

11:00 AM

**Unusual Failures of Aero-Derivative Combustion Turbines:** *Ron Munson*<sup>1</sup>; <sup>1</sup>M&M Engineering

11:20 AM

**High Temperature Corrosion Failures in Gas Turbine Components:** *Edyta Kosieniak*<sup>1</sup>; Jakub Kaczorowski<sup>2</sup>; Marco Innocenti<sup>2</sup>; Krzysztof Biesiada<sup>2</sup>; <sup>1</sup>Institute of Aviation; <sup>2</sup>General Electric, Oil&Gas

11:40 AM

**Icing Study of Moisture in Jet-A Fuel, Ambient to -40°C:** *Jean Ray*<sup>1</sup>; Mark Thornton<sup>1</sup>; Michael Bentz<sup>1</sup>; <sup>1</sup>Boeing

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## Fatigue and Microstructure: A Symposium on Recent Advances: Fatigue of Advanced Materials

*Program Organizers:* Amit Shyam, Oak Ridge National Laboratory; Sushant Jha, Air Force Research Laboratory/Universal Technology Corporation; Michael Caton, US Air Force Research Laboratory

Wednesday AM                      Room: D240/241  
October 19, 2011                      Location: Columbus Con. Center

*Session Chairs:* Amit Shyam, Oak Ridge National Laboratory; Michael Caton, Air Force Research Laboratory

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### 8:00 AM

**Multiaxial Fatigue and Life Prediction in Superelastic Nitinol Medical Devices:** *Robert Ritchie*<sup>1</sup>; David Xu<sup>1</sup>; Amanda Runciman<sup>1</sup>; Alan Pelton<sup>2</sup>; <sup>1</sup>University of California Berkeley; <sup>2</sup>Nitinol Devices & Components, Ltd.

### 8:40 AM

**Effect of Fiber Shot Particles on Fatigue Performance of Hybrid SiC<sub>p</sub>/Fiber Al Metal Matrix Composite:** *Justin Clark*<sup>1</sup>; Paul Sanders<sup>1</sup>; <sup>1</sup>Michigan Technological University

### 9:00 AM

**Fatigue Damage Evolution in an Ultrafine Grained Al Alloy:** *Partha De*<sup>1</sup>; Rajiv Mishra<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology

### 9:20 AM

**Fatigue Resistance of Carbon Nanotube Reinforced Aluminum Composites under Cyclic Tension:** *JINZHI LIAO*<sup>1</sup>; <sup>1</sup>Nanyang Technological University

### 9:40 AM Break

### 10:00 AM

**Fatigue and Fracture in Thin-Film Devices and Hybrid Laminates:** *Reinhold Dauskardt*<sup>1</sup>; <sup>1</sup>Stanford University

### 10:40 AM

**Medical Device Feedthrough Fatigue Characterization:** *Jacob Popp*<sup>1</sup>; John Taylor<sup>1</sup>; Joseph Hendrickson<sup>1</sup>; <sup>1</sup>Medtronic Inc.

### 11:00 AM

**Flex Bending Fatigue of Amorphous Al Alloy Ribbons:** *Chun-Kuo Huang*<sup>1</sup>; John Lewandowski<sup>1</sup>; <sup>1</sup>Case Western Reserve Univ

### 11:20 AM

**Fatigue Properties and Deformation Mechanisms of Nanocrystalline NiFe Alloy under Cyclic Loading:** *Yonghao Zhao*<sup>1</sup>; S. Cheng<sup>2</sup>; Y.M. Wang<sup>3</sup>; Y. Li<sup>1</sup>; X.-L. Wang<sup>4</sup>; P.K. Liaw<sup>2</sup>; E.J. Lavernia<sup>1</sup>; <sup>1</sup>University of California Davis; <sup>2</sup>University of Tennessee, Knoxville, USA; <sup>3</sup>Lawrence Livermore National Laboratory, Livermore; <sup>4</sup>Oak Ridge National Laboratory, Oak Ridge

### 11:40 AM

**Low-Cycle-Fatigue Behavior of Modified and Unmodified Alloy CF8C-Plus at 800C:** *Deepak Kumar*<sup>1</sup>; Amit Shyam<sup>1</sup>; Bruce Pint<sup>1</sup>; Edgar Lara-Curzio<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory

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## Glass and Optical Materials: Glass Modeling and Simulation II

*Program Organizer:* Pierre Lucas, University of Arizona

Wednesday AM                      Room: C111  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* Jincheng Du, University of North Texas

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### 8:00 AM

**Structure and Electronic Properties of Defective Crystalline and Amorphous Graphene:** *Yuting Li*<sup>1</sup>; Fakhar Inam<sup>2</sup>; Vitaliy Kapko<sup>3</sup>; Mike Thorpe<sup>3</sup>; David Drabold<sup>1</sup>; <sup>1</sup>Ohio University; <sup>2</sup>The Abdus Salam ICTP; <sup>3</sup>Arizona State University

### 8:20 AM

**Ab-Initio Calculation of Structural and Electrical Properties of Amorphous TiO<sub>2</sub>:** *Binay Prasai*<sup>1</sup>; Bin Cai<sup>1</sup>; David Drabold<sup>1</sup>; Kylee Underwood<sup>2</sup>; James Lewis<sup>2</sup>; <sup>1</sup>Ohio University; <sup>2</sup>West Virginia University

### 8:40 AM

**Electronic Transport in Amorphous Semiconductors:** *MingLiang Zhang*<sup>1</sup>; <sup>1</sup>Ohio University

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## Glass and Optical Materials: Structure-Properties Relationship in Glass

*Program Organizer:* Pierre Lucas, University of Arizona

Wednesday AM                      Room: C111  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* Prabhat Gupta, The Ohio State University

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### 9:00 AM

**Temperature-Dependent Constraint Theory of Glass:** *John Mauro*<sup>1</sup>; <sup>1</sup>Corning Incorporated

### 9:40 AM Break

### 10:00 AM

**ZrO<sub>2</sub> and SnO<sub>2</sub> Solubility in Soda-Lime Glasses:** *Pauline Gateau*<sup>1</sup>; Carine Petitjean<sup>1</sup>; Pierre-Jean Panteix<sup>1</sup>; Christophe Rapin<sup>1</sup>; Michel Vilasi<sup>1</sup>; Jean-Luc Grapton<sup>2</sup>; <sup>1</sup>Jean Lamour Institute; <sup>2</sup>Ferro France

### 10:20 AM

**Effect of Substituting Al<sub>2</sub>O<sub>3</sub> on the Thermal and Optical Properties of High Refractive Index and Low Dispersion La<sub>2</sub>O<sub>3</sub>-Nb<sub>2</sub>O<sub>5</sub> Glass System Prepared by Containerless Processing:** *Kohei Yoshimoto*<sup>1</sup>; Astunobu Masuno<sup>1</sup>; Hiroyuki Inoue<sup>1</sup>; Yasuhiro Watanabe<sup>1</sup>; <sup>1</sup>Institute of Industrial Science The University of Tokyo

### 10:40 AM

**High Refractive Index of La<sub>2</sub>O<sub>3</sub>-Nb<sub>2</sub>O<sub>5</sub> Glasses Prepared by Containerless Processing:** *Atsunobu Masuno*<sup>1</sup>; Kohei Yoshimoto<sup>1</sup>; Hiroyuki Inoue<sup>1</sup>; Yasuhiro Watanabe<sup>1</sup>; <sup>1</sup>The University of Tokyo

### 11:00 AM

**Effect of Na<sub>2</sub>O Addition on Tungsten-Tellurite Glasses:** *Miray Çelikbilek*<sup>1</sup>; Ali Erçin Ersundu<sup>1</sup>; Süheyla Aydın<sup>1</sup>; <sup>1</sup>Istanbul Technical University

### 11:20 AM

**Characterization of Glasses in the TeO<sub>2</sub>-WO<sub>3</sub>-CdO System:** *Ali Erçin Ersundu*<sup>1</sup>; Miray Çelikbilek<sup>1</sup>; Nuri Solak<sup>1</sup>; Süheyla Aydın<sup>1</sup>; <sup>1</sup>Istanbul Technical University

11:40 AM

**Synthesis and Characterization of New Lead-Free Glasses for the Front Metallization of Solar Cells:** *Maik Peschel*<sup>1</sup>; Jochen Schilm<sup>2</sup>; Markus Eberstein<sup>2</sup>; Christel Kretschmar<sup>2</sup>; Jens Krause<sup>3</sup>; Lars Voelkel<sup>3</sup>; Uwe Partsch<sup>2</sup>; Alexander Michaelis<sup>2</sup>; <sup>1</sup>Fraunhofer Institute for Ceramic Technologies and Systems ; <sup>2</sup>Fraunhofer Institute for Ceramic Technologies and Systems; <sup>3</sup>Roth&Rau AG

12:00 PM

**The Benefits of Polyalkylene Carbonate Binders (QPAC®) for Low Temperature Glass Frit or Powdered Glass in Glass Sealing Applications:** *Peter Ferraro*<sup>1</sup>; <sup>1</sup>Empower Materials

## Green Technologies for Materials Manufacturing and Processing III: Green Materials Processing II

**Program Organizers:** Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST); Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center; Richard Sisson, Worcester Polytechnic Institute, Center for Heat Treating Excellence; Makio Naito, Osaka University

Wednesday AM  
October 19, 2011

Room: D232  
Location: Columbus Con. Center

**Session Chairs:** Makio Naito, Osaka University; Allen Apblett, Oklahoma State University

8:00 AM

**Remediation of Semiconductor Waste Using an Iron Sorbent Prepared via a Low Temperature Route:** *Allen Apblett*<sup>1</sup>; Travis Reed<sup>1</sup>; Abdulaziz Bagabas<sup>2</sup>; <sup>1</sup>Oklahoma State University; <sup>2</sup>King Abdulaziz City for Science and Technology

8:20 AM Invited

**Anti-Stain Surface Treatment for Housing Wet Area:** *Norifumi Isu*<sup>1</sup>; <sup>1</sup>LIXIL Corp.

8:40 AM

**Mesoporous Materials for Sorption of Actinides:** *Allen Apblett*<sup>1</sup>; Zeid Al Othman<sup>2</sup>; <sup>1</sup>Oklahoma State University; <sup>2</sup>King Saud University

9:00 AM

**Fabrication and Properties of Highly Porous Ceramic by the Gelation-Freezing Method:** *Manabu Fukushima*<sup>1</sup>; Tatsuki Ohji<sup>1</sup>; Yu-ichi YOSHIZAWA<sup>1</sup>; <sup>1</sup>AIST (National Institute of Advanced Industrial Science and Technology)

9:20 AM

**Synthesis of ZnO Microtubes by a Simple Wet Process Using Zn Layered Double Hydroxide Precursor:** *Seiji Yamashita*<sup>1</sup>; Takashi Shirai<sup>1</sup>; Masayoshi Fujii<sup>1</sup>; <sup>1</sup>Nagoya Insititute of Technology, Ceramics Research Laboratory

9:40 AM Break

10:00 AM

**Fabrication of Solid Electrolyte Dendrites through Novel Smart Processing:** *Soshu Kirihiara*<sup>1</sup>; Katsuya Noritake<sup>1</sup>; Satoko Tasaki<sup>1</sup>; <sup>1</sup>Osaka University

10:20 AM

**Synthesis of Carbon Nanomaterials via Up-Cycling Several Solid Wastes:** *Chuanwei Zhuo*<sup>1</sup>; Joner Alves<sup>2</sup>; Jorge Tenorio<sup>3</sup>; Yiannis Levendis<sup>1</sup>; <sup>1</sup>Northeastern University; <sup>2</sup>ArcelorMittal Inox Brasil; <sup>3</sup>University of Sao Paulo

10:40 AM

**The Effect of Adding Metakaolinite in the Geopolymer Products from Jordan:** *Hani Khoury*<sup>1</sup>; Islam Aldabsheh<sup>1</sup>; Faten Slatyi<sup>1</sup>; Hubert Rahier<sup>2</sup>; Muayad Esaifan Esaifan<sup>3</sup>; Jan Wastiels<sup>4</sup>; <sup>1</sup>University of Jordan; <sup>2</sup>Dept. Physical Chemistry and polymer Science, ; <sup>3</sup>Dept. of Mechanics of materials and constructions; <sup>4</sup>Dept. of Mechanics of materials and constructions,

11:00 AM

**Microstructural and Mechanical Properties of the Extruded 945-946 Duplex Phase Brass Cu-40Zn-Ti Alloy:** *Haruhiko Atsumi*<sup>1</sup>; Hisashi Imai<sup>1</sup>; Shufeng Li<sup>1</sup>; Katsuyoshi Kondoh<sup>1</sup>; Yoshiharu Kousaka<sup>2</sup>; Akimichi Kojima<sup>2</sup>; <sup>1</sup>Osaka university; <sup>2</sup>San-etsu Co.,Ltd

11:20 AM

**Preparation of Biomass Char for Ironmaking and Its Reactivity:** *Zhengwen Hu*<sup>1</sup>; Jianliang Zhang<sup>1</sup>; Xu Zhang<sup>1</sup>; Zhengyun Fan<sup>1</sup>; Jing Li<sup>1</sup>; <sup>1</sup>University of Science and Technology Beijing

11:40 AM Cancelled

**Thermal and Mechanical Properties of Metakaolin Inorganic Polymeric Green Materials:** *Maricela Lizcano*<sup>1</sup>; Miladin Radovic<sup>1</sup>; Karen Lozano<sup>2</sup>; Andres Gonzalez<sup>2</sup>; <sup>1</sup>Texas A&M University; <sup>2</sup>University of Texas Pan American

## Hardness across the Multi-Scales of Structure and Loading Rate: Structural Aspects II

**Program Organizers:** Ronald Armstrong, University of Maryland; David Bahr, Washington State University; Naresh Thadhani, Georgia Institute of Technology; Stephen Walley, Physics and Chemistry of Solids Cavendish Laboratory

Wednesday AM  
October 19, 2011

Room: C210  
Location: Columbus Con. Center

**Session Chairs:** James Li, University of Rochester; Katerina Aifantis, Michigan Technological University

8:00 AM Invited

**Relating Indentation Behaviour to Crystal Orientation:** *T Ben Britton*<sup>1</sup>; James Herring<sup>1</sup>; David Lloyd<sup>1</sup>; Steve Roberts<sup>1</sup>; Angus Wilkinson<sup>1</sup>; <sup>1</sup>Department of Materials, University of Oxford

8:20 AM

**Indentation Methods to Measure Dislocation Nucleation: Experiments and Simulations:** *David Bahr*<sup>1</sup>; Iman Salehinia<sup>1</sup>; Veronica Perez<sup>1</sup>; Marc Weber<sup>1</sup>; <sup>1</sup>Washington State University

8:40 AM Invited

**Indentation-Induced Deformation Behavior in the Vicinity of Grain Boundary of Fe Alloys:** *Takahito Ohmura*<sup>1</sup>; <sup>1</sup>National Institute for Materials Science

9:00 AM Invited

**Predicting the Hardness of Glass Surfaces:** *Morten Smedskjaer*<sup>1</sup>; John Mauro<sup>2</sup>; Yuanzheng Yue<sup>1</sup>; <sup>1</sup>Aalborg University; <sup>2</sup>Corning Incorporated

9:20 AM

**Loading Rate Dependent Indentation Hardness: Anomalies in Amorphous Metals and High Strength Ceramics:** *Ghatu Subhash*<sup>1</sup>; <sup>1</sup>University of Florida

9:40 AM Break

10:00 AM Invited

**The Quasi-Static Deformation and Shock Response of Single Crystal RDX:** *Kyle Ramos*<sup>1</sup>; Daniel Hooks<sup>1</sup>; David Bahr<sup>2</sup>; Marc Cawkwell<sup>1</sup>; Thomas Sewell<sup>3</sup>; <sup>1</sup>Los Alamos National Laboratory; <sup>2</sup>Washington State University; <sup>3</sup>University of Missouri-Columbia



**10:20 AM Invited**

**Nanoindentation of Molecular Composites to Simulate Deformation and Failure:** *John Yeager*<sup>1</sup>; Kyle Ramos<sup>1</sup>; Dan Hooks<sup>1</sup>; David Bahr<sup>2</sup>; <sup>1</sup>Los Alamos National Laboratory; <sup>2</sup>Washington State University

**10:40 AM Invited**

**Investigating the Correlation between Indentation Hardness and Dynamic Properties of Ceramic Powders:** *Thomas Buchheit*<sup>1</sup>; Tracy Vogler<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

**11:00 AM**

**Using Indentation Footprints to Probe Dislocation Substructure: A Quantized Crystal Plasticity Approach:** Lin Li<sup>1</sup>; *Peter Anderson*<sup>1</sup>; Myoung-Gyu Lee<sup>2</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Pohang University of Science and Technology

**11:20 AM**

**Strain Rate Sensitivity Study of Recovery Across a Clad AA3003/AA6111 Interface by Instrumented Indentation:** Alex Penlington<sup>1</sup>; *Brad Diak*<sup>1</sup>; Haiou Jin<sup>2</sup>; <sup>1</sup>Queen's University; <sup>2</sup>Novelis Inc.

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## **Innovative Processing and Synthesis of Ceramics, Glasses and Composites: Bio-and Electro-Ceramics, Films and Coatings**

*Program Organizers:* J. P. Singh, U.S. Army Research Laboratory; Narottam Bansal, NASA Glenn Research Center; Takashi Goto, Tohoku University

Wednesday AM  
October 19, 2011

Room: C110  
Location: Columbus Con. Center

*Session Chairs:* Takashi Goto, Tohoku University; Jane Adams, Army Research Laboratory

**8:00 AM Invited**

**Bio-Ceramic Coatings by Chemical Vapor Deposition Routes:** *Takashi Goto*<sup>1</sup>; <sup>1</sup>Tohoku University

**8:40 AM**

**Synthesis of Bio-Inspired Nanocomposites by Electrophoretic Deposition:** *P. G. Allison*<sup>1</sup>; P. G. Malone<sup>2</sup>; C. A. Weiss<sup>2</sup>; S. Morefield<sup>2</sup>; R. G. Hidalgo-Hernandez<sup>2</sup>; M. Q. Chandler<sup>2</sup>; <sup>1</sup>US Army Engineer Research & Development Center; <sup>2</sup>US Army Engineer Research & Development Center

**9:00 AM**

**Processing of Multiscale Highly Porous Ceramics for Bioreactor Systems:** *Anthony Finoli*<sup>1</sup>; Nicole Ostrowski<sup>1</sup>; Jorg Gerlach<sup>2</sup>; Ian Nettleship<sup>1</sup>; <sup>1</sup>University of Pittsburgh; <sup>2</sup>McGowan Institute for Regenerative Medicine

**9:20 AM**

**Synthesis and Property Evaluations of Silicon Carbide Nanotube Reinforced Ceramic Matrix Composites:** *Dongming Zhu*<sup>1</sup>; Janet Hurst<sup>1</sup>; <sup>1</sup>NASA Glenn Research Center

**9:40 AM Break****10:00 AM Invited**

**Growing Integration Layer [GIL] Method: Direct Fabrication of Compositionally, Structurally and Functionally Graded Ceramic Films and/or Coatings from Mother Materials in Solution without Firing Processes:** *Masahiro Yoshimura*<sup>1</sup>; Nobuhiro Matsushita<sup>2</sup>; <sup>1</sup>(1) Tokyo Institute of Technology, Japan - and - (2) National Cheng Kung University, Taiwan; <sup>2</sup>Tokyo Institute of Technology

**10:40 AM**

**Molten-Salt Synthesis of Pure and Doped LaAlO<sub>3</sub> Nanoparticles:** *Esmeralda Mendoza-Mendoza*<sup>1</sup>; Sagrario Montemayor<sup>2</sup>; Karinjilottu Padmasree<sup>1</sup>; Antonio Fuentes<sup>1</sup>; <sup>1</sup>Cinvestav del IPN; <sup>2</sup>Universidad Autonoma de Coahuila

**11:00 AM**

**Solid State Metathesis Reactions in the Bi(NO<sub>3</sub>)<sub>3</sub>-NH<sub>4</sub>VO<sub>3</sub>-NaOH System: Room-Temperature Synthesis of Bi:V Mixed Oxides:** Brenda Fuentes-Martinez<sup>1</sup>; Karinjilottu Padmasree<sup>2</sup>; Esmeralda Mendoza-Mendoza<sup>2</sup>; Antonio Fuentes<sup>2</sup>; <sup>1</sup>Instituto Tecnológico de Saltillo; <sup>2</sup>Cinvestav del IPN

**11:20 AM**

**Synthesis and Morphology Control of Templates for Textured Electroceramics:** *Stephen Poterala*<sup>1</sup>; Yunfei Chang<sup>1</sup>; Trevor Clark<sup>1</sup>; Richard Meyer<sup>1</sup>; Gary Messing<sup>1</sup>; <sup>1</sup>Pennsylvania State University

**11:40 AM**

**The Synthesis of Mesoporous SiC Ceramics from Block Copolymer Precursors:** *Xueping Yang*<sup>1</sup>; Linan An<sup>1</sup>; <sup>1</sup>University of Central Florida

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## **Integrated Computational Materials Engineering: Modeling and Simulation Applied to Metals Processing: Elements of ICME: Databases, Microstructure Characterization, and Microstructure and Mechanical Property Prediction**

*Program Organizer:* David Furrer, Pratt & Whitney

Wednesday AM  
October 19, 2011

Room: C213  
Location: Columbus Con. Center

*Session Chairs:* Bernard Billia, CNRS; Valery Rudnev, Inductoheat Inc.

**8:00 AM**

**The "Integrator" for ICME Belongs in the World of Materials Information Management.:** *Will Marsden*<sup>1</sup>; <sup>1</sup>Granta

**8:20 AM**

**Linking Microstructure to Crystal-Plasticity/Finite Element Simulation by Phase-Field and Analytical Calculation for ICME of Ni-Base Superalloys:** *Ning Zhou*<sup>1</sup>; Mahendra Samal<sup>2</sup>; Hallee Deutchman<sup>1</sup>; Somnath Ghosh<sup>3</sup>; Michael Mills<sup>1</sup>; Yunzhi Wang<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Bhabha Atomic Research Centre; <sup>3</sup>Johns Hopkins University

**8:40 AM**

**Probabilistic Fatigue Life Prediction:** *Rajiv Mishra*<sup>1</sup>; Rajeev Kapoor<sup>1</sup>; Nilesh Kumar<sup>1</sup>; Partha De<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology

**9:00 AM**

**Modeling Fatigue Crack Growth:** *Andrew Rosenberger*<sup>1</sup>; <sup>1</sup>USAF

**9:20 AM**

**A Development of Property Prediction Model and Its Applications to the Manufacturing of Steel Plates:** *SeDon Choo*<sup>1</sup>; <sup>1</sup>POSCO

**9:40 AM Break****10:00 AM**

**Experimentally Determined Three-Dimensional Microstructural Data for Use as Initial Information in Simulations and Modeling:** *David Rowenhorst*<sup>1</sup>; Peter Voorhees<sup>2</sup>; Ian McKenna<sup>3</sup>; <sup>1</sup>Naval Research Lab; <sup>2</sup>Northwestern University; <sup>3</sup>University of British Columbia

**10:20 AM**

**Topological Measures of Three-Dimensional Grain Structures from Phase-Field Simulations and the MacPherson-Srolovitz Relation:** *Kunok Chang*<sup>1</sup>; Carl Krill<sup>2</sup>; Long-Qing Chen<sup>3</sup>; <sup>1</sup>Penn State; <sup>2</sup>Ulm University; <sup>3</sup>Penn State



10:40 AM

**Application of Novel Techniques to the Three-Dimensional Characterization of Microstructural Features in  $\alpha/\beta$  Titanium Alloys:** *John Sosa*<sup>1</sup>; Santhosh Koduri<sup>2</sup>; Vikas Dixit<sup>1</sup>; Peter Collins<sup>3</sup>; Stephen Niezgoda<sup>4</sup>; Surya Kalidindi<sup>5</sup>; Hamish Fraser<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Intel Corp; <sup>3</sup>University of North Texas; <sup>4</sup>Los Alamos National Laboratory; <sup>5</sup>Drexel University

11:00 AM

**Models for Microstructure Evolution during TMP of Alpha/Beta Titanium Alloys:** *Lee Semiatin*<sup>1</sup>; David Furrer<sup>2</sup>; Sergey Zhrebtsov<sup>3</sup>; Gennady Salishchev<sup>3</sup>; Chan Hee Park<sup>4</sup>; Chong Soo Lee<sup>5</sup>; Gordon Sargent<sup>6</sup>; <sup>1</sup>US Air Force Research Laboratory; <sup>2</sup>Pratt&Whitney; <sup>3</sup>Belgorod State University; <sup>4</sup>Korea Institute of Materials Science; <sup>5</sup>Pohang University of Science and Technology; <sup>6</sup>UES, Inc.

11:20 AM

**Stationary Grain Size Distribution of Three-Dimensional Phase-Field Simulations of Grain Growth:** *Kunok Chang*<sup>1</sup>; Carl Krill<sup>2</sup>; Long-Qing Chen<sup>3</sup>; <sup>1</sup>Penn State ; <sup>2</sup>Ulm University; <sup>3</sup>Penn State

11:40 AM

**A Phase-Field Study of Microstructure Evolution in Single- and Polycrystalline Titanium Alloy:** *Tae Wook Heo*<sup>1</sup>; Saswata Bhattacharyya<sup>1</sup>; Donald Shih<sup>2</sup>; Long-Qing Chen<sup>1</sup>; <sup>1</sup>The Pennsylvania State University; <sup>2</sup>Boeing Research & Technology

## Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches -- Fundamental and Engineering Issues: Interfaces in Polycrystals

**Program Organizers:** Wayne Kaplan, Technion - Israel Institute of Technology; Paul Wynblatt, Carnegie Mellon University; Dominique Chatain, Centre Interdisciplinaire de Nanoscience de Marseille; Mikel Holcomb, West Virginia University

Wednesday AM  
October 19, 2011

Room: C120  
Location: Columbus Con. Center

**Session Chairs:** Paul Wynblatt, Carnegie Mellon University ; Helen Chan, Lehigh University

8:00 AM Keynote

**The Five Parameter Grain Boundary Energy Distribution:** *Gregory Rohrer*<sup>1</sup>; <sup>1</sup>Carnegie Mellon University

8:40 AM Invited

**Computed Grain Boundary Energies: Trends among Elements and Comparisons to Experiment:** *Stephen Foiles*<sup>1</sup>; Elizabeth Holm<sup>1</sup>; Gregory Rohrer<sup>2</sup>; Anthony Rollett<sup>2</sup>; Jia Li<sup>2</sup>; David Olmsted<sup>3</sup>; <sup>1</sup>Sandia National Laboratories; <sup>2</sup>Carnegie Mellon University; <sup>3</sup>University of California, Berkeley

9:00 AM

**Very Strong Interactions at Precious-Metal/Oxide Interfaces Studied by Atomic-Resolution Transmission Electron Microscopy:** *Michael B. Katz*<sup>1</sup>; Yingwen Duan<sup>1</sup>; Baihai Li<sup>1</sup>; Hong Liu<sup>1</sup>; Carolina Adamo<sup>1</sup>; Carolina Adamo<sup>2</sup>; Darrell Schlom<sup>2</sup>; Liang Chen<sup>3</sup>; George Graham<sup>1</sup>; Xiaoqing Pan<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>Cornell University; <sup>3</sup>Ningbo Institute of Materials Technology and Engineering

9:20 AM Invited

**The Orientation and Morphology of Pt Precipitates within Sapphire:** *Melissa Santala*<sup>1</sup>; Velimir Radmilovic<sup>2</sup>; Raquel Giulian<sup>3</sup>; Mark Ridgway<sup>3</sup>; Ronald Gronsky<sup>4</sup>; *Andreas Glaeser*<sup>4</sup>; <sup>1</sup>Lawrence Livermore National Laboratory; <sup>2</sup>National Center for Electron Microscopy; <sup>3</sup>Australian National University; <sup>4</sup>University of California

9:40 AM Break

10:00 AM Invited

**Atomic Imaging and Spectroscopy on Interfaces and Grain Boundaries Using an Aberration Corrected Transmission Electron Microscope:** *Bert Freitag*<sup>1</sup>; Joerg Jinschek<sup>1</sup>; Dmitri Klenov<sup>1</sup>; <sup>1</sup>FEI Company

10:20 AM

**Effect of ytterbium on Grain Boundary Structure and Grain Growth in Magnesium Aluminate Spinel:** *George Ferko*<sup>1</sup>; <sup>1</sup>Lehigh University

10:40 AM

**Effects of Thermal Cycling and Thermal/Humidity Hold on Texture Evolution of Sn, Sn-Cu, and Sn-Cu-Pb Electroplated Films:** *Pylin Sarobol*<sup>1</sup>; John Koppes<sup>1</sup>; Peng Su<sup>2</sup>; John Blendell<sup>1</sup>; Carol Handwerker<sup>1</sup>; <sup>1</sup>Purdue University; <sup>2</sup>Cisco Systems, Inc.

11:00 AM

**Evolution of the Grain Boundary Character Distribution in 3D Grain Coarsening Observed with Non-Destructive High Energy X-ray Diffraction Microscopy**

: *C.M. Hefferan*<sup>1</sup>; S. Li<sup>1</sup>; J. Lind<sup>1</sup>; A. Rollett<sup>2</sup>; U. Lienert<sup>3</sup>; R. Suter<sup>1</sup>; <sup>1</sup>Carnegie Mellon University, Department of Physics; <sup>2</sup>Carnegie Mellon University, Department of Materials Science & Engineering; <sup>3</sup>Argonne National Laboratory, Advanced Photon Source

11:20 AM

**Measuring Grain Boundary Character Distribution (GBCD) in Three-Dimensionally Reconstructed Polycrystalline Materials:** *Sukbin Lee*<sup>1</sup>; Anthony Rollett<sup>1</sup>; Gregory Rohrer<sup>1</sup>; <sup>1</sup>Carnegie Mellon University

11:40 AM

**Temperature Dependent Interface Energy and Mobility Anisotropy in Strontium Titanate:** *Wolfgang Rheinheimer*<sup>1</sup>; Michael Bäurer<sup>1</sup>; Michael Hoffmann<sup>1</sup>; Peter Pfundstein<sup>1</sup>; Dagmar Gerthsen<sup>1</sup>; <sup>1</sup>Karlsruhe Institute of Technology

## International Symposium on Advances in Nanostructured Materials and Applications: The 2011 Acta Materialia Gold Medal Symposium: Nanometals II: Size Effects in Metals, Nanotwins, Nanolayers and Others

**Program Organizers:** Haiyan Wang, Texas A&M University; Nugehalli Ravindra, New Jersey Institute of Technology; Alan Ardell, National Science Foundation; Yuntian Zhu, North Carolina State University; Xinghang Zhang, Texas A&M University; Rajiv K. Singh, University of Florida; John Prater, Army Research Office

Wednesday AM  
October 19, 2011

Room: E170  
Location: Columbus Con. Center

**Session Chairs:** Suveen Mathaudhu, U.S. Army Research Office; Irene Beyerlein, Los Alamos National Lab

8:00 AM Invited

**Microstructural Evolution and Mechanical Properties of Ultrafine Grained Metals:** *Marc Meyers*<sup>1</sup>; T. G. Langdon<sup>2</sup>; M. Kawazaki<sup>2</sup>; <sup>1</sup>University of California, San Diego; <sup>2</sup>University of Southern California

**8:20 AM Invited**

**Fatigue Deformation of a Nanocrystalline NiFe Alloy:** *Peter Liaw*<sup>1</sup>; S. Cheng<sup>1</sup>; S. Lee<sup>1</sup>; L. Li<sup>1</sup>; Y. Zhao<sup>1</sup>; J. Almer<sup>1</sup>; X.-L. Wang<sup>1</sup>; E. Lavernia<sup>1</sup>; Tamás Ungár<sup>2</sup>; <sup>1</sup>Univ of Tennessee; <sup>2</sup>Eötvös University Budapest

**8:40 AM Invited**

**Structure and Mechanical Properties of Nanoscale Metal – Metal Nitride Multilayers:** *Amit Misra*<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

**9:00 AM**

**The Characteristic Interface of Accumulative Roll Bonding in Cu/Nb Nanolamellar Multilayers:** *John Carpenter*<sup>1</sup>; Sven Vogel<sup>1</sup>; Thomas Wynn<sup>1</sup>; Robert Dickerson<sup>1</sup>; Weizhong Han<sup>1</sup>; Rodney McCabe<sup>1</sup>; Irene Beyerlein<sup>1</sup>; Nathan Mara<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

**9:20 AM Invited**

**Gradients & Nanoscales:** *Elias Aifantis*<sup>1</sup>; <sup>1</sup>Aristotle U. Thessaloniki, Greece

**9:40 AM Break****10:00 AM Invited**

**Uncovering Impurity Effects on Grain Boundaries of Tantalum and Tungsten—from First-Principles Calculations:** *Zhiliang Pan*<sup>1</sup>; Laszlo Kecskes<sup>2</sup>; *Qiuming Wei*<sup>1</sup>; <sup>1</sup>University of North Carolina at Charlotte; <sup>2</sup>US ARL

**10:20 AM Invited**

**Thermodynamically Stabilized Nano- and Metastable Materials:** *Laszlo Kecskes*<sup>1</sup>; K. A. Darling<sup>1</sup>; <sup>1</sup>US Army Research Laboratory

**10:40 AM Invited**

**Effect of Neutron Irradiation on Mechanical Behavior of Nanograin Structured Cu:** *Korukonda Murty*<sup>1</sup>; *Walid Mohamed*<sup>1</sup>; Jacob Eapen<sup>1</sup>; Doug Porter<sup>2</sup>; <sup>1</sup>North Carolina State University; <sup>2</sup>Idaho National Laboratory

**11:00 AM Invited**

**Energetics of Twinning Shear and Shuffle Mechanisms in Metals:** *Huseyin Sehitoglu*<sup>1</sup>; Tawhid Ezaz<sup>1</sup>; Hans Maier<sup>2</sup>; <sup>1</sup>University of Illinois; <sup>2</sup>University of Paderborn

**11:20 AM**

**Grain-Size Effect on Twinning in Nanostructured FCC Metals:** *Yuntian Zhu*<sup>1</sup>; Xiaolei Wu<sup>2</sup>; Xiaozhou Liao<sup>3</sup>; <sup>1</sup>North Carolina State University; <sup>2</sup>Institute of Mechanics, Chinese Academy of Sciences; <sup>3</sup>The University of Sydney

**11:40 AM**

**Microstructure and Properties of Nanotwinned Metal Films:** *Xinghang Zhang*<sup>1</sup>; *Daniel Bufford*<sup>1</sup>; Haiyan Wang<sup>1</sup>; Osman Anderoglu<sup>2</sup>; Nan Li<sup>2</sup>; Amit Misra<sup>2</sup>; Jian Wang<sup>2</sup>; <sup>1</sup>Texas A&M University; <sup>2</sup>Los Alamos National Laboratory

**12:00 PM**

**Deformation Twinning in Shock Compressed Cu/Nb Nanolaminates:** *Weizhong Han*<sup>1</sup>; Nathan Mara<sup>1</sup>; Amit Misra<sup>1</sup>; Timothy Germann<sup>1</sup>; Richard Hoagland<sup>1</sup>; Shengnian Luo<sup>1</sup>; <sup>1</sup>Los Alamos National Lab

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## International Symposium on Defects, Transport and Related Phenomena: Defects and Transport in Ceramics IV

*Program Organizers:* Sangtae Kim, University of California, Davis; Ruediger Dieckmann, Cornell University; Doreen Edwards, Alfred University; Manfred Martin, RWTH Aachen University; Thomas Mason, Northwestern University

Wednesday AM  
October 19, 2011

Room: C122  
Location: Columbus Con. Center

*Funding support provided by:* WCU Hybrid Materials Program, Department of Materials Science and Engineering, Seoul National University, Korea

*Session Chairs:* Ruediger Dieckmann, Cornell University; Tatsuya Kawada, Tohoku University

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**8:00 AM Invited**

**Combined Rietveld Analysis of X-Ray and Neutron Diffraction Data of Zinc Oxide Transparent Conductors:** *Gabriela Gonzalez Aviles*<sup>1</sup>; Rofeideh Mansourian<sup>1</sup>; Bryan Hardnacke<sup>1</sup>; Anna Wesolik<sup>1</sup>; Jordan Gardner<sup>1</sup>; John Okasinski<sup>2</sup>; <sup>1</sup>DePaul University; <sup>2</sup>Argonne National Laboratory

**8:40 AM**

**Local and Defect Structures of Amorphous Transparent Conducting Oxide Thin Films:** *Qimin Zhu*<sup>1</sup>; Diana Proffit<sup>1</sup>; Qing Ma<sup>2</sup>; D. Buchholz<sup>1</sup>; Robert Chang<sup>1</sup>; Michael Bedzyk<sup>1</sup>; Thomas Mason<sup>1</sup>; <sup>1</sup>Dept. of Materials Science and Engineering, Northwestern University; <sup>2</sup>DND-CAT, Synchrotron Research Center at the Advanced Photon Source, Northwestern University

**9:00 AM**

**Oxygen Binding and Nonstoichiometry in Cation-Doped Indium Oxide Transparent Conductors:** *Oliver Warschkow*<sup>1</sup>; <sup>1</sup>The University of Sydney

**9:20 AM**

**Defect Mechanisms in In-Ga-Zn-O and In-Zn-O Homologous Phases:** *Alexander Adler*<sup>1</sup>; E. Mitchell Hopper<sup>1</sup>; Sung-Hwan Song<sup>2</sup>; Haowei Peng<sup>2</sup>; Arthur Freeman<sup>2</sup>; Julia Medvedeva<sup>3</sup>; Thomas Mason<sup>1</sup>; <sup>1</sup>Department of Materials Science, Northwestern University; <sup>2</sup>Department of Physics and Astronomy, Northwestern University; <sup>3</sup>Department of Physics, Missouri University of Science & Technology

**9:40 AM Break****10:00 AM Invited**

**Non-Stoichiometry, Inversion and Cation Migration in MgAl<sub>2</sub>O<sub>4</sub>:** *Robin Grimes*<sup>1</sup>; Samuel Murphy<sup>1</sup>; <sup>1</sup>Imperial College London

**10:40 AM**

**Computational Study of Defect Clustering and Diffusion in Solid Solutions of Aliovalently Doped ThO<sub>2</sub>:** *Vitaly Alexandrov*<sup>1</sup>; Niels Gronbech-Jensen<sup>1</sup>; Alexandra Navrotsky<sup>1</sup>; Mark Asta<sup>2</sup>; <sup>1</sup>University of California, Davis; <sup>2</sup>University of California, Berkeley

**11:00 AM**

**Ab Initio Calculations of Defects in Gallium Oxide:** *Tobias Zacherle*<sup>1</sup>; Peter Schmidt<sup>1</sup>; *Manfred Martin*<sup>2</sup>; <sup>1</sup>RWTH Aachen University; <sup>2</sup>RWTH Aachen University; WCU Hybrid Materials Program, Seoul National University

**11:20 AM Invited**

**Relationship between Mechanical and Defect Chemical Properties of Oxide Ceramics:** *Tatsuya Kawada*<sup>1</sup>; Yuta Kimura<sup>1</sup>; Takuto Kushi<sup>1</sup>; Junya Amada<sup>1</sup>; Sin-ichi Hashimoto<sup>1</sup>; Koji Amezawa<sup>1</sup>; <sup>1</sup>Tohoku University

## Joining and Sustaining of Superalloys: Joining and Sustaining of Ni-Base Superalloys: Part I

**Program Organizers:** Sammy Tin, Illinois Institute of Technology; Jeffrey Evans, University of Alabama in Huntsville; David Mourer, GE Aviation; Judith Schneider, Mississippi State University; Ji-Cheng Zhao, The Ohio State University

Wednesday AM  
October 19, 2011

Room: E161A  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

### 8:00 AM Invited

**Microstructural and Residual Stress Characterisation of Nickel Base Superalloy Inertia Friction Welds:** *Michael Preuss<sup>1</sup>; Philip Withers<sup>2</sup>; Gavin Baxter<sup>2</sup>; <sup>1</sup>University of Manchester; <sup>2</sup>Rolls-Royce plc.*

### 8:40 AM Invited

**Microstructural Features of Inertia Friction Welded Powder-Based RR1000 Superalloy:** *Zewen Huang<sup>1</sup>; Hangyue Li<sup>1</sup>; Gavin Baxter<sup>2</sup>; Simon Bray<sup>2</sup>; Paul Bowen<sup>1</sup>; <sup>1</sup>The University of Birmingham; <sup>2</sup>Rolls-Royce plc*

### 9:00 AM

**Weld Mechanical Properties and Weldability of a Ni-Mo-Cr Alloy:** *Jeremy Caron<sup>1</sup>; S. Krishna Srivastava<sup>1</sup>; Lee Pike<sup>1</sup>; <sup>1</sup>Haynes International, Inc.*

### 9:20 AM Break

### 9:40 AM Invited

**Friction Stir Welding and Processing of Nickel Based Superalloys:** *Bharat Jasthi<sup>1</sup>; Edward Chen<sup>2</sup>; Christian Widener<sup>1</sup>; Michael West<sup>1</sup>; <sup>1</sup>South Dakota School of Mines and Technology; <sup>2</sup>Transition45 Technologies, Inc*

### 10:20 AM

**Weld Solidification Behavior of INCONEL™ Alloy 740H:** *David Tung<sup>1</sup>; John Lippold<sup>1</sup>; <sup>1</sup>The Ohio State University*

### 10:40 AM

**Analysis on Laser Cladding Applied for a Ni-Based Single Crystal Alloy:** *Sin Ho Kang<sup>1</sup>; Kui Dong Choi<sup>1</sup>; Chang Keun Roh<sup>1</sup>; Duck Su Kim<sup>1</sup>; Kil Jin Chung<sup>1</sup>; Jeo Ho Park<sup>1</sup>; <sup>1</sup>KEPCO KPS*

### 11:00 AM

**Improved Stress Rupture Properties of Transient Liquid Phase Bonded CMSX-4 Single Crystal for Industrial Gas Turbine:** *Doo Soo Kim<sup>1</sup>; Han Sang Lee<sup>1</sup>; Keun-Bong Yoo<sup>1</sup>; Kyu-So Song<sup>1</sup>; <sup>1</sup>KEPCO Research Institute*

## Joining of Advanced and Specialty Materials (JASM XIII): Micro and Nano Joining I

**Program Organizers:** Judith Schneider, Mississippi State University; Norman Zhou, Univ. of Waterloo; Leijun Li, Utah State University; Mathieu Brochu, McGill University; Boian Alexandrov, The Ohio State University; Michael Halbig, U.S. Army Research Laboratory; Akio Hirose, Osaka University; Sammy Tin, Illinois Institute of Technology

Wednesday AM  
October 19, 2011

Room: E161B  
Location: Columbus Con. Center

*Session Chairs:* Mathieu Brochu, McGill University; Norman Zhou, University of Waterloo; Akio Hirose, Osaka University

### 8:00 AM Invited

**Size Effects on Deformation and Fracture Behavior of Sn3.0Ag0.5Cu/Cu Lead-Free Solder Joints:** *Yanhong Tian<sup>1</sup>; <sup>1</sup>Harbin Institute of Technology*

### 8:40 AM

**Characterization of low temperature bonding with Cu nanoparticles for electronic packaging application:** *Jianfeng Yan<sup>1</sup>; Guisheng Zou<sup>1</sup>; Xiaoyu Wang<sup>1</sup>; Fengwen Mu<sup>1</sup>; Hailin Bai<sup>1</sup>; Aiping Wu<sup>1</sup>; Anming Hu<sup>2</sup>; Y.Norman Zhou<sup>2</sup>; <sup>1</sup>Tsinghua University; <sup>2</sup>University of Waterloo*

### 9:00 AM

**An Innovative Method of Adhesive Bonding by Direct Application of Electrical Current to Carbon Nanotube (CNT) Film Infiltrated with Epoxy Adhesives:** *Shih-Chin Chang<sup>1</sup>; Bing-Cheng Sung<sup>1</sup>; <sup>1</sup>National Tsing Hua University*

### 9:20 AM

**Low temperature bonding process using mixed Cu-Ag nanoparticles for electronic packaging:** *Guisheng Zou<sup>1</sup>; Jianfeng Yan<sup>1</sup>; Xiaoyu Wang<sup>1</sup>; Fengwen Mu<sup>1</sup>; Hailin Bai<sup>1</sup>; Aiping Wu<sup>1</sup>; Anming Hu<sup>2</sup>; Y.Norman Zhou<sup>2</sup>; <sup>1</sup>Tsinghua University; <sup>2</sup>University of Waterloo*

### 9:40 AM Break

### 10:00 AM

**Hardening of Aluminum Using Femtosecond Laser-Driven Shock Wave:** *Yutaro Isshiki<sup>1</sup>; Tomokazu Sano<sup>1</sup>; Tomo Ogura<sup>1</sup>; Kazuto Arakawa<sup>1</sup>; Masayuki Okoshi<sup>2</sup>; Narumi Inoue<sup>2</sup>; Kojiro Kobayashi<sup>3</sup>; Akio Hirose<sup>1</sup>; <sup>1</sup>Osaka University; <sup>2</sup>National Defense Academy of Japan; <sup>3</sup>The Wakasa Wan Energy Research Center*

### 10:20 AM

**Potentiality of Femtosecond Laser as a New Tool for Laser Shock Peening Process:** *Tomokazu Sano<sup>1</sup>; Takahiro Tsukada<sup>1</sup>; Tomo Ogura<sup>1</sup>; Masayuki Okoshi<sup>2</sup>; Narumi Inoue<sup>2</sup>; Kojiro Kobayashi<sup>3</sup>; Akio Hirose<sup>1</sup>; <sup>1</sup>Osaka University; <sup>2</sup>National Defense Academy of Japan; <sup>3</sup>The Wakasa Wan Energy Research Center*

### 10:40 AM

**Femtosecond Laser Nanowelding and Surface Processing of Ag /TiO<sub>2</sub> Nanowire Membranes for Solar Photovoltaic Applications:** *Anming Hu<sup>1</sup>; Y. Zhou<sup>1</sup>; <sup>1</sup>University of Waterloo*

### 11:00 AM

**Laser Annealing of Silver Nanoparticles Thin Films:** *Peng Peng<sup>1</sup>; Anming Hu<sup>1</sup>; Norman Zhou<sup>1</sup>; <sup>1</sup>University of Waterloo*

### 11:20 AM

**Effects of Particle Size and Solvent on Bondability of Metal-to-Metal Bonding Using Silver Nanoparticle Paste:** *Akio Hirose<sup>1</sup>; Tomo Ogura<sup>1</sup>; Yosuke Konaka<sup>1</sup>; Eichi Ide<sup>2</sup>; Toshiaki Morita<sup>2</sup>; <sup>1</sup>Osaka University; <sup>2</sup>Hitachi Ltd.*

### 11:40 AM

**Application of Aluminum-Based Nano-Thermite for Dissimilar Joining of Copper to Glass:** *Golnaz Bohloul-Zanjani<sup>1</sup>; Anming Hu<sup>1</sup>; John Persic<sup>2</sup>; John Z. Wen<sup>1</sup>; Y. Norman Zhou<sup>1</sup>; <sup>1</sup>University of Waterloo; <sup>2</sup>Microbonds Inc.*

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## Materials Science Challenges for Nuclear Applications: Nuclear Fuels I

**Program Organizers:** Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprashad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Wednesday AM                      Room: C225  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* Bill Lee, Imperial College London

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### 8:00 AM Invited

**Thermochemical Behavior of Oxide Nuclear Fuel to High Burnup: Effect of Lanthanides:** *Theodore Besmann*<sup>1</sup>; *Stewart Voit*<sup>1</sup>; *Dongwon Shin*<sup>1</sup>; *Evan Noon*<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory

### 8:40 AM

**Phase-Field Simulation of Intergranular Bubble Growth and Percolation:** *Paul Millett*<sup>1</sup>; *Michael Tonks*<sup>1</sup>; *Bulent Biner*<sup>1</sup>; <sup>1</sup>Idaho National Laboratory

### 9:00 AM

**Characterization of ThO<sub>2</sub>-UO<sub>2</sub> Mixed Oxide System Using Atomic Level Simulations:** *Rakesh Behera*<sup>1</sup>; *Chaitanya Deo*<sup>1</sup>; <sup>1</sup>Georgia Institute of Technology

### 9:20 AM

**First Principles Calculations of the Electronic and Atomic Structure of Radiation Defects in PuO<sub>2</sub>:** *Eugene Kotomin*<sup>1</sup>; *Denis Gryaznov*<sup>2</sup>; *Leon Petit*<sup>3</sup>; *Axel Svane*<sup>4</sup>; <sup>1</sup>Max Planck Institute; <sup>2</sup>Max Planck Institute; <sup>3</sup>Daresbury Laboratory; <sup>4</sup>Aarhus University

### 9:40 AM Break

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## Materials Science Challenges for Nuclear Applications: Nuclear Fuels II

**Program Organizers:** Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprashad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Wednesday AM                      Room: C225  
October 19, 2011                      Location: Columbus Con. Center

*Session Chairs:* Ramprashad Prabhakaran, Idaho National Laboratory; Dawn Janney, Idaho National Laboratory

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### 10:00 AM

**Modeling Nuclear Fuels with a Combined Potts-Phase Field Model:** *Eric Homer*<sup>1</sup>; *Veena Tikare*<sup>1</sup>; *Elizabeth Holm*<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

### 10:40 AM

**Uranium Localization in Alpha-Plutonium:** *Angelique Neuman*<sup>1</sup>; *Troy Nothwang*<sup>1</sup>; *Fredrick Hampel*<sup>1</sup>; *Franz Freibert*<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

### 11:00 AM

**Microstructures and Relationships between Rare-Earth Elements and Actinides in U-Pu-Zr-Np-Am Alloys with 8% Rare-Earth Elements:** *Dawn Janney*<sup>1</sup>; *Bulent Sencer*<sup>1</sup>; *Robert Mariani*<sup>1</sup>; *Rory Kennedy*<sup>1</sup>; *Thomas Hartmann*<sup>2</sup>; *Leah Squires*<sup>1</sup>; <sup>1</sup>Idaho National Laboratory; <sup>2</sup>University of Nevada, Las Vegas

### 11:20 AM

**Microstructural Characterization of Candidate Burnable Absorber Materials for Application in LEU U-Mo Fuel Plates:** *Dennis Keiser*<sup>1</sup>; *Jan-Fong Jue*<sup>1</sup>; *Irina Glagolenko*<sup>1</sup>; *Glenn Moore*<sup>1</sup>; *Curtis Clark*<sup>1</sup>; *Barry Rabin*<sup>1</sup>; *Daniel Wachs*<sup>1</sup>; *Ashley Ewh*<sup>2</sup>; *Yongho Sohn*<sup>2</sup>; *Bo Yao*<sup>2</sup>; *Totju Totev*<sup>3</sup>; *Tom Wiencek*<sup>3</sup>; <sup>1</sup>Idaho National Laboratory; <sup>2</sup>University of Central Florida; <sup>3</sup>Argonne National Laboratory

### 11:40 AM

**Studying the Effect of Carbon on DU-Mo Foil Fabrication for the RERT Application:** *Ramprashad Prabhakaran*<sup>1</sup>; *Douglas Burkes*<sup>1</sup>; *Brandon Miller*<sup>1</sup>; *Amy DeMint*<sup>2</sup>; *Jack Gooch*<sup>2</sup>; *Dennis Keiser*<sup>1</sup>; *Daniel Wachs*<sup>1</sup>; *Indrajit Charit*<sup>3</sup>; <sup>1</sup>Idaho National Laboratory; <sup>2</sup>Y-12 National Security Complex; <sup>3</sup>University of Idaho

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## Multifunctional Oxides: Session IV

**Program Organizer:** Xiaoqing Pan, University of Michigan

Wednesday AM                      Room: E162A  
October 19, 2011                      Location: Columbus Con. Center

*Session Chairs:* Fumiyasu Oba, Kyoto University; Haiyan Wang, Texas A&M University

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### 8:00 AM Invited

**A Size-Dependent Nanoscale Metal Insulator Transition in Random Materials: Application to Resistance Random Access Memory (ReRAM):** *Xiang Yang*<sup>1</sup>; *Albert Chen*<sup>1</sup>; *Byungjoon Choi*<sup>1</sup>; *I-Wei Chen*<sup>1</sup>; <sup>1</sup>University of Pennsylvania

### 8:40 AM

**Effect of Microstructure and Composition on Electromagnetic Properties of Co<sub>2</sub>Z Ferrite at >1 GHz:** *Lang Qin*<sup>1</sup>; *Krenar Shqau*<sup>1</sup>; *Lanlin Zhang*<sup>2</sup>; *John Volakis*<sup>2</sup>; *Henk Verweij*<sup>1</sup>; <sup>1</sup>Group Inorganic Materials Science, Department of Materials Science & Engineering, Ohio State University; <sup>2</sup>ElectroScience Lab, Ohio State University

### 9:00 AM Invited

**Native Point Defects in Functional Oxides: An Approach from First Principles:** *Fumiyasu Oba*<sup>1</sup>; <sup>1</sup>Kyoto University

### 9:40 AM Break

### 10:00 AM Invited

**A Novel Nano-Structured Hybrid-Composite ITO-CNT Transparent Electrode for Enabling Transparent BST-Based Tunable Devices for L-Band Communications Applications:** *Melanie Cole*<sup>1</sup>; *Mat Ivill*<sup>1</sup>; *Ryan Toonen*<sup>1</sup>; *S. Gary Hirsch*<sup>1</sup>; *Eric Ngo*<sup>1</sup>; <sup>1</sup>U.S. Army Research Laboratory, WMRD

### 10:40 AM

**Spatially-Resolved Electronic Transport Measurements of ZnO Thin Films:** *Kui Zhang*<sup>1</sup>; *Jacob Jokisaari*<sup>1</sup>; *Tassilo Heeg*<sup>2</sup>; *Darrell Schlom*<sup>2</sup>; *Xiaoqing Pan*<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>Cornell University



## Nanotechnology for Energy, Healthcare and Industry: Session I

**Program Organizers:** Gary Pickrell, Virginia Tech; Suveen Mathaudhu, U.S. Army Research Office; Wolfgang Sigmund, University of Florida; Jud Ready, Georgia Tech; George Wei, Osram Sylvania; Ke Wang, Virginia Tech; Zhiwei Shan, Jiaotong University; Alpesh Shukla, Lawrence Berkeley National Laboratory; Nitin Chopra, The University of Alabama; Sudipta Seal, Univ of Central Florida; Navin Manjorran, Siemens Corporation; Julia Greer, California Institute of Technology

Wednesday AM  
October 19, 2011

Room: C125  
Location: Columbus Con. Center

**Session Chairs:** Gary Pickrell, Virginia Tech; Navin Manjorran, Siemens Corporate Technology

### 8:00 AM

**Current Status and Prospects of Nanotechnology in Arab States:** *Bassam Alfeeli*<sup>1</sup>; <sup>1</sup>Kuwait Institute for Scientific Research

### 8:40 AM

**Adsorption and Photocatalytic Degradation Kinetics of Pharmaceuticals by TiO<sub>2</sub> Nanowire Membranes during Water Treatment:** *Anming Hu*<sup>1</sup>; D. Luong<sup>1</sup>; X. Zhang<sup>1</sup>; P. Peng<sup>1</sup>; K. Oakes<sup>1</sup>; M. Servos<sup>1</sup>; Y. Zhou<sup>1</sup>; <sup>1</sup>University of Waterloo

### 9:00 AM

**Copper Micro and Nano Particles Based Low Cost Water Purifier:** *Rajendran Suruliyandi*<sup>1</sup>; <sup>1</sup>SARASWATHINARAYANAN COLLEGE

### 9:20 AM Cancelled

**Colloid-Chemical Nanoprocesses of Oxyhydrate Systems for Energy and Healthcare:** *Tatiana Prolubnikova*<sup>1</sup>; Yuri Sucharev<sup>1</sup>; Irina Lebedeva<sup>1</sup>; <sup>1</sup>Chelyabinsk State University

### 9:40 AM Break

### 10:00 AM

**Finite Element Modeling for Mode Reduction in Bundled Sapphire Photonic Crystal Fibers:** *Neal Pfeifferberger*<sup>1</sup>; Gary Pickrell<sup>1</sup>; <sup>1</sup>Virginia Tech

### 10:20 AM

**Mutant Strains of Mycobacteria Smegmatis with Resistance to Silver Nanoparticles:** *Curtis Larimer*<sup>1</sup>; Ian Nettleship<sup>1</sup>; Anil Ojha<sup>1</sup>; Mohammad Shyful Islam<sup>1</sup>; <sup>1</sup>University of Pittsburgh

### 10:40 AM

**Perovskite Nanosheets Produced by Chemical Exfoliation of Aurivillius Phase Bi<sub>2</sub>CaNaNb<sub>3</sub>O<sub>12</sub>:** *Jian Liu*<sup>1</sup>; Vicoria Knox<sup>1</sup>; Jianwanjun Shi<sup>1</sup>; Graham King<sup>2</sup>; Sven Vogel<sup>2</sup>; Scott Mixture<sup>1</sup>; <sup>1</sup>Alfred Univeristy; <sup>2</sup>Los Alamos National Lab

### 11:00 AM

**Characterization of Nitrogen Doped Aurivillius Photocatalysts:** *Victoria Knox*<sup>1</sup>; Scott Mixture<sup>1</sup>; <sup>1</sup>Alfred University

## Next Generation Biomaterials: Advanced Biomaterials

**Program Organizers:** Roger Narayan, Univ of North Carolina & North Carolina State Univ; Kalpana Katti, North Dakota State University; Kajal Mallick, University of Warwick; Vilupanur Ravi, California State Polytechnic University, Pomona; Varshni Singh, Louisiana State University

Wednesday AM  
October 19, 2011

Room: C215  
Location: Columbus Con. Center

**Session Chairs:** Varshni Singh, Louisiana State University; Federico Rosei, INRS

### 8:00 AM Invited

**Probing Molecular Polarization at Interfaces of De Novo Proteins and Electrode Surfaces:** *Kendra Kathan-Galipeau*<sup>1</sup>; Bohdana Discher<sup>1</sup>; *Dawn Bonnell*<sup>1</sup>; <sup>1</sup>U Penn

### 8:20 AM Invited

**Aligned Nanofiber Multiwell Plates for Cancer Research:** *John Lannutti*<sup>1</sup>; Jed Johnson<sup>2</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Nanofiber Solutions LLC

### 8:40 AM

**An Experiment-Simulation Approach to Determine Electrospun Fiber Properties:** *Greg Ebersole*<sup>1</sup>; Jackie Ohmura<sup>1</sup>; Heather Powell<sup>1</sup>; *Peter Anderson*<sup>1</sup>; <sup>1</sup>The Ohio State University

### 9:00 AM Invited

**Iron/Iron Oxide Core/Shell Nanoparticles for Magnetic Hyperthermia Treatment:** *I. Baker*<sup>1</sup>; Katsiaryna Kekalo<sup>1</sup>; <sup>1</sup>Dartmouth College

### 9:20 AM Invited

**Nanoscale Modification of Biomaterials to Control Cell Growth:** *Federico Rosei*<sup>1</sup>; <sup>1</sup>INRS

### 9:40 AM Break

### 10:00 AM Invited

**Bio-Doped Metal Oxides for High-Throughput Biosensors:** *Pelagia Gouma*<sup>1</sup>; <sup>1</sup>SUNY Stony Brook

### 10:20 AM Invited

**BioMEMS Devices and Applications of Parylene Biocompatible Coating:** *Varshni Singh*<sup>1</sup>; Quoc Nguyen<sup>1</sup>; Martina Cihova<sup>2</sup>; Jost Goettert<sup>1</sup>; Todd Monroe<sup>1</sup>; <sup>1</sup>Louisiana State University; <sup>2</sup>Karlsruhe Institute of Technology

### 10:40 AM

**PCL-Gelatin Nanofibers for Extended Drug Release:** *Tyler Nelson*<sup>1</sup>; Hrishikesh Munj<sup>1</sup>; Carol Lee<sup>1</sup>; Heather Powell<sup>1</sup>; David Tomasko<sup>1</sup>; John Lannutti<sup>1</sup>; <sup>1</sup>The Ohio State University

### 11:00 AM Invited

**Application of Polymer-Based Microfluidic Devices for the Selection and Manipulation of Low-Abundant Biological Cells:** *Malgorzata Witek*<sup>1</sup>; Udaya Dharmasiri<sup>1</sup>; Samuel Njoroge<sup>1</sup>; Morayo Adebisi<sup>1</sup>; Joyce Kamande<sup>1</sup>; Mateusz Hupert<sup>1</sup>; Francis Barany<sup>2</sup>; Steven Soper<sup>1</sup>; <sup>1</sup>Louisiana State University; <sup>2</sup>Weill Cornell Medical College

### 11:20 AM

**Development of Magnesium-Zinc-Calcium Biodegradable Alloys:** *Zhigang Xu*<sup>1</sup>; Christopher Smith<sup>1</sup>; Jag Sankar<sup>1</sup>; <sup>1</sup>NC A&T State University

### 11:40 AM Invited

**Effect of Heat Treatment and Boron Content on the Behavior of Ti Alloys in PBS and 0.9 wt% NaCl Solutions:** *Vilupanur Ravi*<sup>1</sup>; <sup>1</sup>California State Polytechnic University, Pomona



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## Next Generation Biomaterials: Frontiers in Biological and Biomedical Materials

*Program Organizers:* Roger Narayan, Univ of North Carolina & North Carolina State Univ; Kalpana Katti, North Dakota State University; Kajal Mallick, University of Warwick; Vilupanur Ravi, California State Polytechnic University, Pomona; Varshni Singh, Louisiana State University

Wednesday AM  
October 19, 2011

Room: B200/201  
Location: Columbus Con. Center

*Session Chairs:* Leon Shaw, University of Connecticut; Christian Bonhomme, Laboratoire de Chimie de la Matière Condensée

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### 8:00 AM

**Angiogenic Bioactive Borate Glasses:** *Steven Jung*<sup>1</sup>; Delbert Day<sup>2</sup>; Roger Brown<sup>2</sup>; <sup>1</sup>Mo-Sci Corporation; <sup>2</sup>Missouri University of Science and Technology

### 8:20 AM Invited

**Biomaterials: From Models to Spectroscopic Characterization:** *christian bonhomme*<sup>1</sup>; <sup>1</sup>UPMC Paris 6

### 8:40 AM

**In-Vivo Evaluation of 13-93 Bioactive Glass Scaffolds Made by Selective Laser Sintering (SLS):** *Mariano Velez*<sup>1</sup>; Krishna Kolan<sup>2</sup>; Ming Leu<sup>3</sup>; Steve Jung<sup>1</sup>; Delbert Day<sup>3</sup>; Tien-Min Chu<sup>4</sup>; <sup>1</sup>Mo-Sci Corporation; <sup>2</sup>Missouri University of Science and Technology; <sup>3</sup>Missouri University of Science and Technology; <sup>4</sup>Indiana University

### 9:00 AM Invited

**Low Temperature Sintering of Ti-6Al-4V for Orthopedic Implant Applications:** *Kyle Crosby*<sup>1</sup>; Leon Shaw<sup>1</sup>; <sup>1</sup>University of Connecticut

### 9:20 AM Cancelled

**Mechanical Properties of Implant Rods Made of Ti-29Nb-13Ta-4.6Zr for Spinal Fixture:** *Mitsuo Niinomi*<sup>1</sup>; Masaaki Nakai<sup>1</sup>; Junko Hieda<sup>1</sup>; <sup>1</sup>Tohoku University

### 9:40 AM Break

### 10:00 AM Invited

**Next Generation Orthopaedic Implants by Additive Manufacturing Using Electron Beam Melting:** *L. Murr*<sup>1</sup>; Sara Gaytan<sup>1</sup>; Edwin Martinez<sup>2</sup>; Frank Medina<sup>2</sup>; Ryan Wicker<sup>2</sup>; <sup>1</sup>University of Texas at El Paso; <sup>2</sup>W.M. Keck Center for 3D Innovation, University of Texas at El Paso

### 10:20 AM Invited

**Origins of the Fracture Resistance of Bone and Its Biological Degradation:** *Robert Ritchie*<sup>1</sup>; <sup>1</sup>University of California Berkeley

### 10:40 AM Invited

**Scaffolds to Guide Stem Cells for Bone and Dentin Regeneration:** *Peter Ma*<sup>1</sup>; <sup>1</sup>University of Michigan

### 11:00 AM Invited

**Titanium with Designed Elongated Pores for Biomedical Implants:** *David Dunand*<sup>1</sup>; <sup>1</sup>Northwestern University

### 11:20 AM Invited

**Bioprinting of Living Cells for 3D Tissues:** *Wei Sun*<sup>1</sup>; <sup>1</sup>Drexel University

### 11:40 AM Invited

**Predicting Microstructure Evolution in Drug Eluting Coatings:** *David Saylor*<sup>1</sup>; <sup>1</sup>FDA-CDRH-OSEL

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## Novel Sintering Processes and News in Traditional Sintering and Grain Growth: Field Assisted and NanoSintering III

*Program Organizers:* Ricardo H. R. Castro, University of California at Davis; Douglas Gouvêa, Universidade de São Paulo

Wednesday AM  
October 19, 2011

Room: C222  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

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### 8:00 AM

**Effect of High Pressure on the Microstructure and Mechanical Properties of Nanostructured Aluminum Alloy Consolidated by Spark Plasma Sintering:** *Dongming Liu*<sup>1</sup>; Yuhong Xiong<sup>1</sup>; Ying Li<sup>1</sup>; Troy Topping<sup>1</sup>; Chris Haines<sup>2</sup>; Joseph Paras<sup>2</sup>; Darold Martin<sup>2</sup>; Deepak Kapoor<sup>2</sup>; Julie Schoenung<sup>1</sup>; Enrique Lavernia<sup>1</sup>; <sup>1</sup>University of California, Davis; <sup>2</sup>US Army, RDECOM-ARDEC

### 8:20 AM

**High-Speed Compaction of Powder Materials at High Voltage Electric Discharge Consolidation:** *Evgeny Grigoryev*<sup>1</sup>; <sup>1</sup>MEPHI

### 8:40 AM Invited

**Field Assisted Sintering of Bulk Nanometric Oxides: Understanding the Basic Mechanisms:** *Umberto Anselmi-Tamburini*<sup>1</sup>; <sup>1</sup>University of Pavia

### 9:20 AM Break

### 9:40 AM

**Numerical Simulation of Microstructural Evolution during Sintering at the Meso-Scale:** *Veena Tikare*<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

### 10:20 AM

**Novel Processing of IR Transparent Nanocrystalline Ceramic Composites by Spark Plasma Sintering:** *Colby Brunet*<sup>1</sup>; Olivia Graeve<sup>1</sup>; <sup>1</sup>Alfred University

### 10:40 AM

**Thermal Stability in Sintering of Cryomilled Al-Nb Alloys:** *David Walker*<sup>1</sup>; William Caley<sup>2</sup>; Mathieu Brochu<sup>1</sup>; <sup>1</sup>McGill University; <sup>2</sup>Dalhousie University

### 11:00 AM

**Modifying the Thermal Stability of Nanocrystalline Tungsten Powders:** *Brady Butler*<sup>1</sup>; Kristopher Darling<sup>1</sup>; Micah Gallagher<sup>1</sup>; Eric Klier<sup>1</sup>; James Paramore<sup>1</sup>; Heidi Maupin<sup>1</sup>; <sup>1</sup>U.S. Army Research Laboratory

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## Particulate Composites: Particulate Composites I

*Program Organizers:* Ivi Smid, Penn State; James Foley, Los Alamos National Laboratory; Ravi K. Enneti, Global Tungsten and Powders Corporation

Wednesday AM  
October 19, 2011

Room: C115  
Location: Columbus Con. Center

*Session Chair:* Ivi Smid, Penn State

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### 10:00 AM

**Advanced Powdermetallurgical Technologies to Manufacture Metal Matrix Composites:** *Thomas Weissgaerber*<sup>1</sup>; Thomas Hutsch<sup>1</sup>; Thomas Schubert<sup>1</sup>; Bernd Kieback<sup>1</sup>; <sup>1</sup>Fraunhofer Institute IFAM Dresden

### 10:40 AM

**The Effects of Sand Size on the Abrasion Resistance of Alloys and Tungsten Carbide-Based MMC Overlays:** *Gary Fisher*<sup>1</sup>; Tonya Wolfe<sup>1</sup>; *John Wolodko*<sup>1</sup>; <sup>1</sup>Alberta Innovates - Technology Futures

**11:00 AM**

**Comparative Evaluation of Tensile Bond Strength & Microleakage of Prime & Bond NT & Gluma Comfort Bond: An In-Vitro Study:** *Abhishek Kirpal<sup>1</sup>; Rahul Bhola<sup>1</sup>; Sonya Kirpal<sup>2</sup>; Vinod Gujral<sup>2</sup>; <sup>1</sup>School of Dentistry; <sup>2</sup>EnviroHealth Research Labs*

**11:20 AM**

**Preparation of Octahedral Silver-Copper Alloy Powders:** *Qunyan Wei<sup>1</sup>; Depeng Zhao<sup>1</sup>; Jienan Qiu<sup>1</sup>; Hong Guo<sup>1</sup>; <sup>1</sup>Yunnan university, School of Chemistry Science and Technology*

**11:40 AM Break**

## Particulate Composites: Particulate Composites II

**Program Organizers:** Ivi Smid, Penn State; James Foley, Los Alamos National Laboratory; Ravi K. Enneti, Global Tungsten and Powders Corporation

Wednesday AM  
October 19, 2011

Room: C115  
Location: Columbus Con. Center

*Session Chair:* Ravi Enneti, Global Tungsten & Powders

**8:00 AM**

**Properties and Performance of High-Pressure High-Temperature Sintered Diamond-SiC Composites:** *Thomas Easley<sup>1</sup>; <sup>1</sup>Diamond Innovations*

**8:20 AM**

**Cold-Sprayed Self-Lubricating Coatings Utilizing Ni-Encapsulated Particulate Composites:** *Ivi Smid<sup>1</sup>; Lisa Stark<sup>1</sup>; Albert Segall<sup>1</sup>; Tim Eden<sup>1</sup>; <sup>1</sup>Penn State*

**8:40 AM**

**Researches Regarding the Structure Investigations on New Materials of the Composite Type:** *Alexandru Antoniu Cernaianu Stoianovici<sup>1</sup>; <sup>1</sup>COREF*

**9:00 AM**

**Highly conductive  $\delta$ -Bi<sub>2</sub>O<sub>3</sub> pathway in a Bi<sub>2</sub>O<sub>3</sub> ceramic matrix with dispersed 8YSZ spheres:** *Li-Der Liu<sup>1</sup>; Wen-Cheng Wei<sup>1</sup>; <sup>1</sup>National Taiwan University*

## Pb-Free Solders and Next Generation Interconnects: Microstructure, Crystallography, and Mechanical Behavior of Pb-free Solders

**Program Organizers:** Sehoon Yoo, Korea Institute of Industrial Technology; Andre Lee, Michigan State University; Govindarajan Muralidharan, Oak Ridge National Laboratory; Young-Ho Kim, Hanyang University

Wednesday AM  
October 19, 2011

Room: E160B  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

**8:00 AM**

**Thermal Diffusivity Measurements in Sn-Based Pb-Free Solder Alloys:** *Ghazal Alipour<sup>1</sup>; Michael Banish<sup>1</sup>; <sup>1</sup>University of Alabama in Huntsville*

**8:20 AM**

**Crystal Plasticity Finite Element Modeling of Shear Test in Lead-Free Solder Joints:** *Payam Darbandi<sup>1</sup>; Bite Zhou<sup>1</sup>; Farhang Pourboghrat<sup>1</sup>; Thomas Bieler<sup>1</sup>; Tae Lee<sup>1</sup>; Kuo Liu<sup>1</sup>; <sup>1</sup>Michigan state university*

**8:40 AM**

**Preferred Lattice Orientations of Cu<sub>6</sub>Sn<sub>5</sub> Formed on Ni Substrate:** *W. M. Chen<sup>1</sup>; C. Robert Kao<sup>1</sup>; <sup>1</sup>National Taiwan University*

**9:00 AM**

**New method to measure Intermetallic Compound layer thickness and the development of a new equation to predict its growth:** *Jose Servin<sup>1</sup>; <sup>1</sup>Continental*

**9:20 AM**

**Solder Volume Effect on the Growth Behavior of Pd-Ni-Sn Intermetallic Compound in Microelectronic Solder Joints:** *Cheng-En Ho<sup>1</sup>; Sheng-Wei Lin<sup>1</sup>; Md. Arifur Rahman<sup>1</sup>; <sup>1</sup>Yuan Ze University*

**9:40 AM Break**

**10:00 AM**

**The Effect of Ag and Cu on Sn Nucleation:** *Gregory Parks<sup>1</sup>; Eric Cotts<sup>1</sup>; <sup>1</sup>Binghamton University*

**10:20 AM**

**Effects of Molybdenum Nanoparticles Addition on the Interface between Sn-3.8Ag-0.7Cu Solder and Copper Substrate during Multiple Reflow:** *Md. Arafat Mahmood<sup>1</sup>; A. S. M. A. Haseeb<sup>1</sup>; Mohd Rafie Johan<sup>1</sup>; <sup>1</sup>University of Malaya*

**10:40 AM**

**Effects of Solder Joint Size and Configuration on the Evolution of Mechanical Properties in Aging:** *Tariq Tashtoush<sup>1</sup>; Babak Arfaei<sup>1</sup>; Peter Borgesen<sup>1</sup>; <sup>1</sup>State University of New York at Binghamton*

**11:00 AM**

**On the Variability of Mechanical Strength in Bi Containing Sn-Ag-Cu Pb-Free Solder Alloys:** *Mashdalina Matahir<sup>1</sup>; Le Thieng Chin<sup>1</sup>; Kha Sheng Tan<sup>1</sup>; Ayodele Olofinjana<sup>1</sup>; <sup>1</sup>Universiti Brunei Darussalam*

**11:20 AM**

**Atlas of Lead-Free Soldering Systems as a Set of Computer Models:** *Vasily Lutsyk<sup>1</sup>; Vera Vorobjeva<sup>1</sup>; <sup>1</sup>Physical Materials Science Institute*

## Phase Stability, Diffusion, Kinetics and their Applications (PSDK-VI): Alloy Design and Phase Stability Modeling

**Program Organizers:** Jeffrey LaCombe, University of Nevada, Reno; Yongho Sohn, University of Central Florida; John Morral, Ohio State University; Ursula Kattner, National Institute of Standards and Technology; Abhijeet Misra, QuesTek Innovations LLC

Wednesday AM  
October 19, 2011

Room: C214  
Location: Columbus Con. Center

*Session Chairs:* Yuri Mishin, George Mason University; Alonso Jaques, Universidad Tecnica Federico Santa Maria

**8:00 AM**

**Computationally-Guided Discovery of Efficient Metal-Organic Frameworks for CO<sub>2</sub> Capture:** *Donald Siegel<sup>1</sup>; Hyun Seung Koh<sup>1</sup>; Jinhyung Hwang<sup>1</sup>; <sup>1</sup>University of Michigan*

**8:40 AM**

**First-Principles Study of Lattice Dynamics and Thermodynamics of TiO<sub>2</sub> Polymorphs:** *Zhi-Gang Mei<sup>1</sup>; Yi Wang<sup>1</sup>; Shunli Shang<sup>1</sup>; Zi-Kui Liu<sup>1</sup>; <sup>1</sup>Pennsylvania State University*

**9:00 AM**

**Modelling the Influence of Cooling Rate on the Precipitate Evolution in Al-Mg-Si (Cu) Alloys:** *Peter Lang<sup>1</sup>; Ahmad Falahati<sup>1</sup>; Rene Radis<sup>2</sup>; Erwin Povoden-Karadeniz<sup>1</sup>; Mohammad Ahmadi<sup>1</sup>; Piotr Warczak<sup>1</sup>; Ernst Kozeschnik<sup>1</sup>; <sup>1</sup>Vienna University of Technology; <sup>2</sup>Graz University of Technology*

9:20 AM

**Phase Stability of  $\text{Ni}_{1-x}\text{Mg}_x\text{Al}_2\text{O}_4$  Spinel under Reducing Conditions and the Influence of Stabilizing Elements:** *Brenden Hill*<sup>1</sup>; *Micheline Miller*<sup>2</sup>; *Scott Mixture*<sup>1</sup>; <sup>1</sup>Alfred University; <sup>2</sup>Excellerant Ceramics

9:40 AM Break

10:00 AM

**Defected-Mediated Properties in Bulk and Nanoparticle Metallic Alloys: Quantitative Prediction of Phase Stability, Mechanical Properties and Kinetics:** *Duane Johnson*<sup>1</sup>; <sup>1</sup>Ames Laboratory/Iowa State University

10:40 AM

**Multi-Scale Modeling on Microstructures and Microstructure-Property Relations of High Temperature Materials for Fossil Energy Applications:** *Kaisheng Wu*<sup>1</sup>; *De Nyago Tafen*<sup>1</sup>; *Michael Gao*<sup>1</sup>; *Jeffery Hawk*<sup>2</sup>; <sup>1</sup>National Energy Technology Lab; URS Coporation; <sup>2</sup>National Energy Technology Lab

11:00 AM

**Atomic Scale Investigation of Classical and Non-Classical Gamma Prime Precipitation in Nickel Base Alloys:** *Antariksh Singh*<sup>1</sup>; *Gopal Viswanathan*<sup>2</sup>; *Soumya Nag*<sup>1</sup>; *Junyeon Hwang*<sup>1</sup>; *Jaimie Tiley*<sup>2</sup>; *Hamish Fraser*<sup>3</sup>; *Rajarshi Banerjee*<sup>1</sup>; <sup>1</sup>University of North Texas; <sup>2</sup>Air Force Research Laboratory; <sup>3</sup>The Ohio State University

11:20 AM

**Thermo-Kinetic Computer Simulation of Precipitation and Age-Hardening Effect in Al-Mg-Si Alloys with Arbitrary Heat Treatment:** *Ahmad Falahati*<sup>1</sup>; *Mohammad Ahmadi*<sup>1</sup>; *Peter Lang*<sup>1</sup>; *Erwin Povoden-Karadeniz*<sup>2</sup>; *Piotr Warczok*<sup>1</sup>; *Ernst Kozeschnik*<sup>1</sup>; <sup>1</sup>Vienna University of Technology

11:40 AM

**Role of Different Heterogeneous Nucleation Sites on Precipitation of Alpha Platelets in the Beta Matrix of Titanium Alloys:** *Peeyush Nandwana*<sup>1</sup>; *Soumya Nag*<sup>1</sup>; *Arun Devaraj*<sup>1</sup>; *Rajarshi Banerjee*<sup>1</sup>; *Hamish Fraser*<sup>2</sup>; <sup>1</sup>University of North Texas; <sup>2</sup>The Ohio State University

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## Professor K. K. Chawla Honorary Symposium on Fibers, Foams and Composites: Science and Engineering: Metal Matrix Composites/Polymer Matrix Composites

**Program Organizers:** *Nikhilesh Chawla*, Arizona State University; *Aldo Boccaccini*, University of Erlangen-Nuremberg; *Gary Gladysz*, Trelleborg USA; *Pedro D. Portella*, Federal Institute of Testing and Materials BAM

Wednesday AM  
October 19, 2011

Room: D234  
Location: Columbus Con. Center

**Session Chairs:** *Javier Llorca*, IMDEA; *Pedro Portella*, Federal Institute of Testing and Materials - BAM

8:00 AM Invited

**Studies of Nanocrystalline Copper-Refractory Metal Alloys:** *J. Rigsbee*<sup>1</sup>; <sup>1</sup>North Carolina State University

8:40 AM Invited

**Functionally Designed Hard Materials:** *Zhigang Fang*<sup>1</sup>; <sup>1</sup>University of Utah

9:20 AM

**Tensile Instability in Unidirectional Ductile/Ductile Phase Composites:** *Arda Cetin*<sup>1</sup>; *Cécile Bernardi*<sup>1</sup>; *Shoichi Nambu*<sup>2</sup>; *Andreas Rossoll*<sup>1</sup>; *Junya Inoue*<sup>2</sup>; *Toshihiko Koseki*<sup>2</sup>; *Andreas Mortensen*<sup>1</sup>; <sup>1</sup>Ecole Polytechnique Fédérale de Lausanne; <sup>2</sup>The University of Tokyo

9:40 AM Break

10:00 AM

**High-Temperature Deformation of Powder Metallurgy Si-Al Composites and Their Matrices:** *Farghalli Mohamed*<sup>1</sup>; <sup>1</sup>University of California, Irvine

10:20 AM

**Effect of Thermal Cycling on Tensile Creep Behavior of Powder Metallurgy Processed Al-5 Vol.% SiCp Composite Hot-Rolled at 400 or 600 oC:** *Jishnu Bhattacharyya*<sup>1</sup>; *Rahul Mitra*<sup>1</sup>; <sup>1</sup>Indian Institute of Technology

10:40 AM Invited

**Effect of Cure Cycle on Void Distribution and Mechanical Properties of Polymer-Matrix Composites**

: *Javier Llorca*<sup>1</sup>; *Silvia Hernández*<sup>2</sup>; *Federico Sket*<sup>2</sup>; *Jon M. Molina-Aldareguia*<sup>2</sup>; *Carlos González*<sup>1</sup>; <sup>1</sup>Polytechnic University of Madrid/IMDEA Materials Institute; <sup>2</sup>IMDEA Materials Institute

11:20 AM Invited

**Structural Health Monitoring of Wind Turbine Blades:** *Volker Trappe*<sup>1</sup>; *Fabian Grasse*<sup>1</sup>; *Sebastian Thoens*<sup>1</sup>; *Samir Said*<sup>1</sup>; *Pedro D. Portella*<sup>1</sup>; <sup>1</sup>Federal Institute of Testing and Materials BAM

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## Recent Advances in Structural Characterization of Materials: Scattering Methods

**Program Organizers:** *Chad Parish*, Oak Ridge National Laboratory; *Roumiana Petrova*, New Jersey Institute of Tech; *Jacob Jones*, University of Florida; *Zhonghou Cai*, Argonne National Laboratory; *Gang Chen*, Ohio University

Wednesday AM  
October 19, 2011

Room: C212  
Location: Columbus Con. Center

**Session Chairs:** *Gang Chen*, Ohio University; *Chad Parish*, Oak Ridge National Labs

8:00 AM Invited

**Recent developments in research on disordered materials using high energy x-ray diffraction.:** *Chris Benmore*<sup>1</sup>; <sup>1</sup>Argonne National Laboratory

8:40 AM Invited

**In Situ Studies on the Effect of Oxygen Partial Pressure on Ferroelectric Thin Films:** *Dillon Fong*<sup>1</sup>; *Chad Folkman*<sup>1</sup>; *Matthew Highland*<sup>1</sup>; *Tiffany Santos*<sup>1</sup>; *Seong Keun Kim*<sup>1</sup>; *Peter Baldo*<sup>1</sup>; *Paul Fuoss*<sup>1</sup>; *Carol Thompson*<sup>2</sup>; *Jeffrey Eastman*<sup>1</sup>; *Stephen Streiffer*<sup>1</sup>; *G Stephenson*<sup>1</sup>; <sup>1</sup>Argonne National Laboratory; <sup>2</sup>Northern Illinois University

9:20 AM

**Structure of Exfoliated Layered Oxides from Combined Techniques:** *Scott Mixture*<sup>1</sup>; *Jiawanjun Shi*<sup>1</sup>; <sup>1</sup>Alfred University

9:40 AM Break

10:00 AM Invited

**Tightly Packaged DNA in a Test Tube and in a Nano-Container:** *Xiangyun Qiu*<sup>1</sup>; <sup>1</sup>George Washington University

10:40 AM

**Synchrotron X-Rays Simplified: A Rapid Access Mail-In Powder Service at the Advanced Photon Source:** *Matthew Suchomel*<sup>1</sup>; *Lynn Ribaud*<sup>1</sup>; *Robert Von Dreele*<sup>1</sup>; *Brian Toby*<sup>1</sup>; <sup>1</sup>Argonne National Laboratory

11:00 AM

**Rietveld Refinement of an Oil Field Cement Blend:** *Benjamin Iverson*<sup>1</sup>; *Christopher Edwards*<sup>1</sup>; *Ray Loghry*<sup>1</sup>; <sup>1</sup>Halliburton

11:20 AM

**Study of Correlation between Tensile Properties and Micro-Structure of TWIP Steels with Al Variation by Using In-Situ Neutron Scattering Experiments:** Jae-suk Jeong<sup>1</sup>; Yang-Mo Koo<sup>1</sup>; Wan Chuck Woo<sup>1</sup>; Se-kyun Kwon<sup>1</sup>; <sup>1</sup>POSTECH

## Recent Developments in Steel Processing: Session II

*Program Organizer:* Bhaskar Yalamanchili, Gerdau Ameristeel.com

Wednesday AM  
October 19, 2011

Room: D142/143  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

8:00 AM

**Hot Ductility of Ti Bearing High Strength Steel:** Myeonghun kang<sup>1</sup>; Jae-Sang Lee<sup>1</sup>; YangMo Koo<sup>1</sup>; <sup>1</sup>GIFT,POSTECH

8:20 AM

**Modification of Steelmaking Slag by Additions of Salt Cake and KAIF4 from Aluminum Production:** Greg Sweet<sup>1</sup>; Georges Kipourou<sup>2</sup>; Stephan Ferenczy<sup>1</sup>; <sup>1</sup>Steel Dynamics Inc.; <sup>2</sup>Dalhousie University

8:40 AM

**Energy Analysis of EAF with Electromagnetic Stirring:** Xiaojing Zhang<sup>1</sup>; Cen Zhang<sup>1</sup>; Ola Widlund<sup>1</sup>; Jan-Erik Eriksson<sup>1</sup>; Mohamed Ali Rahmani<sup>1</sup>; Olof Hjortstam<sup>1</sup>; <sup>1</sup>ABB Corporate Research

9:00 AM

**Accelerated Carbide Spheroidisation and Refinement (ASR) of Steel AISI 1042:** Jaromir Dlouhy<sup>2</sup>; Daniela Hauserová<sup>1</sup>; Zbyšek Nový<sup>1</sup>; Jozef Zrník<sup>1</sup>; <sup>1</sup>COMTES FHT

9:20 AM

**Use of Industrial Ink Jet Printers for Controlled Lubrication of Mill Rolls:** Steve Liker<sup>1</sup>; <sup>1</sup>Trident Industrial Ink Jet

9:40 AM Break

10:00 AM

**Fine Grained Steel Developed through High Strain and Rapid Heat Treatment:** Preethi Manjunatha<sup>1</sup>; Vijaya Prasad<sup>1</sup>; Dhanoj Balakrishnan<sup>1</sup>; Ram Natarajan<sup>1</sup>; Palaniyapillai Shanmugam<sup>1</sup>; <sup>1</sup>Tube Investments of India Ltd

10:20 AM

**Grain Refinement in Dual Phase Plain Low Carbon Steels:** vishnu charan Sangem<sup>1</sup>; Hamid Azizi-Alizamini<sup>1</sup>; Matthias Militzer<sup>1</sup>; <sup>1</sup>UBC

10:40 AM

**Dual-Phase Ultrafine Grained Steels Produced by Controlled Rolling Processes:** María José Quintana<sup>1</sup>; Roberto González<sup>1</sup>; Luis Felipe Verdeja<sup>2</sup>; José Ignacio Verdeja<sup>2</sup>; <sup>1</sup>Universidad Panamericana; <sup>2</sup>Oviedo University

11:00 AM

**Evolution of Textures and Microstructures in Low-Reduction Rolled and Annealed Low-Carbon Steels:** Kyu Hwan Oh<sup>1</sup>; Yang Mo Koo<sup>1</sup>; Dong Nyung Lee<sup>1</sup>; <sup>1</sup>Graduate Institute of Ferrous Technology, Pohang University of Science and Technology

11:20 AM

**Practice and Analysis on Deep Dephosphorization and Desulfurization Pretreatment of Hot Metal by Soda Ash:** zhe jiang<sup>1</sup>; Jianliang Zhang<sup>1</sup>; Bing Dai<sup>1</sup>; <sup>1</sup>University Science and Technology Beijing

11:40 AM

**Study on the Position of Continuous Casting Slab Final Solidifying Point:** Lianghua Feng<sup>1</sup>; Miaoyong Zhu<sup>1</sup>; <sup>1</sup>University of Science and Technology Liaoning China

## Refractory Materials: Refractory Ceramics General Session

*Program Organizers:* James Hemrick, Oak Ridge National Laboratory; William Headrick, Jr, Missouri Refractories; Dana Goski, Allied Mineral Products; Paul Ormond, AluChem, Inc.; Dave Tucker, CE Minerals; Mike Alexander, Riverside Refractories Inc.

Wednesday AM  
October 19, 2011

Room: C226  
Location: Columbus Con. Center

*Session Chairs:* Dana Goski, Allied Mineral Products, Inc.; William Headrick, Missouri Refractories Co. Inc.

8:00 AM

**Analysis of Drying Process for Castable Refractories:** Satoru Shimizu<sup>1</sup>; Koji Yamaguchi<sup>1</sup>; Yoshisato Kiyota<sup>1</sup>; Hisaohiro Matsunaga<sup>1</sup>; <sup>1</sup>JFE Steel Corporation

8:20 AM

**New, Higher Purity Homogenized Bauxite and Its Applications:** Bill Porter<sup>1</sup>; John Karson<sup>1</sup>; Brooke Xi<sup>2</sup>; <sup>1</sup>Overseas Trade Network; <sup>2</sup>Henan Rongann Thermo-Technical New Materials Co., LTD.

8:40 AM

**Advantages of Calcium Hexaluminate in a Corrosive Environment:** Dale Zacherl<sup>1</sup>; Marion Schnabel<sup>2</sup>; Andreas Buhr<sup>2</sup>; Gunter Buechel<sup>2</sup>; Rainer Kocke<sup>2</sup>; <sup>1</sup>Almatis, Inc; <sup>2</sup>Almatis GmbH

9:00 AM

**Microstructural Characterization of an Alumina Zirconia Silicate (AZS) Refractory Material for Molten Metal Application:** Brian Hetzel<sup>1</sup>; Klaus-Markus Peters<sup>1</sup>; James Hemrick<sup>2</sup>; <sup>1</sup>Fireline, Inc.; <sup>2</sup>Oak Ridge National Laboratory

9:20 AM

**Non Contact Ultra High Temperature Characterization of UHTC Using Electro-Magnetic Mechanical Apparatus:** Sindhura Gangireddy<sup>1</sup>; John Halloran<sup>1</sup>; Zachary Wing<sup>2</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>Advanced Ceramic Manufacturing

9:40 AM Break

10:00 AM

**Hot Blast Stoves: Refractory Tradition and Innovative Refractory Solutions:** Floris van Laar<sup>1</sup>; Yuechu Ma<sup>2</sup>; Laura Irwin<sup>2</sup>; <sup>1</sup>Allied Mineral Technical Service, Inc.; <sup>2</sup>Allied Mineral Products, Inc.

10:20 AM

**Materials and Design of Refractory Linings for Use in O<sub>2</sub>-Enriched Sulfur Recovery Reaction Furnaces:** Syed Rahman<sup>1</sup>; <sup>1</sup>ConocoPhillips

10:40 AM

**Fabrication of Cost-Effective Mullite from Rice Hulls:** Peigen Zhang<sup>1</sup>; Jiandong Liang<sup>1</sup>; Kaiyang Wang<sup>1</sup>; Shengmin Guo<sup>1</sup>; <sup>1</sup>LSU

11:00 AM

**Molecular Scale Mixing for Determination of Mullite Solid Solution Limits:** Thomas McGee<sup>1</sup>; <sup>1</sup>Iowa State University

11:20 AM

**Activated Synthesis & Sintering of Complex Spinel Bonded Basic Refractories:** Rahul Lodha<sup>1</sup>; Carmen Oprea<sup>1</sup>; Hamidreza Zargar<sup>1</sup>; George Oprea<sup>1</sup>; Tom Troczynski<sup>1</sup>; <sup>1</sup>University of British Columbia



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## Sosman Award Symposium: Interface Structure and Microstructure Evolution in Ceramics

*Program Organizers:* Veena Tikare, Sandia National Laboratories; Sung-Yoon Chung, Inha University

Wednesday AM                      Room: C113/114  
October 19, 2011                      Location: Columbus Con. Center

*Session Chairs:* Veena Tikare, Sandia National Laboratories; Sung-Yoon Chung, Inha University

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### 8:00 AM Introductory Comments

#### 8:20 AM

**Abnormal Growth of Grains with Cubic Shapes and Singular Grain Boundaries in Sintered Ni:** *Duk Yong Yoon*<sup>1</sup>; Sang-Hyun Jung<sup>2</sup>; Suk-Joong Kang<sup>2</sup>; <sup>1</sup>KAIST & POSTECH; <sup>2</sup>KAIST

#### 8:40 AM

**Survey of Grain Boundary Motion Mechanisms in FCC Metals:** *Elizabeth Holm*<sup>1</sup>; Eric Homer<sup>1</sup>; Stephen Foiles<sup>1</sup>; David Olmsted<sup>2</sup>; <sup>1</sup>Sandia National Laboratories; <sup>2</sup>University of California Berkeley

#### 9:00 AM

**Influence of Grain Boundary Energy on Microstructure Evolution:** Herbert Miller<sup>1</sup>; *Gregory Rohrer*<sup>1</sup>; <sup>1</sup>Carnegie Mellon University

#### 9:20 AM

**Grain Boundary Dynamics and Atomic Structures in Ceramics:** *Yuichi Ikuhara*<sup>1</sup>; <sup>1</sup>University of Tokyo/Japan Fine Ceramics Center, WPI, Tohoku University

#### 9:40 AM Break

#### 10:00 AM

**Tuning the Template-Matrix Interface for Templated Grain Growth of Textured Ceramics:** *Gary Messing*<sup>1</sup>; Stephen Poterala<sup>1</sup>; Yunfei Chang<sup>1</sup>; <sup>1</sup>The Pennsylvania State University

#### 10:20 AM

**Developing Grain Boundary "Phase" Diagrams as a New Materials Science Tool:** *Jian Luo*<sup>1</sup>; <sup>1</sup>Clemson University

#### 10:40 AM

**Role of Complexions in Heat-Treatment Strategies for Microstructure Control:** *Martin Harmer*<sup>1</sup>; Shuailei Ma<sup>1</sup>; <sup>1</sup>Lehigh University

#### 11:00 AM

**Energy and Structure of Nanometer-Thick Intergranular Films:** Mor Baram<sup>1</sup>; Dominique Chatain<sup>2</sup>; *Wayne Kaplan*<sup>1</sup>; <sup>1</sup>Technion - Israel Institute of Technology; <sup>2</sup>CNRS, Aix-Marseille University

#### 11:20 AM

**Proximity Effects for Interfaces:** *W. Craig Carter*<sup>1</sup>; <sup>1</sup>MIT

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## Steel Product Metallurgy and Applications: Alloying and Precipitation

*Program Organizer:* Bhaskar Yalamanchili, Gerdau Ameristeel.com

Wednesday AM                      Room: D132  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* To Be Announced

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#### 8:00 AM

**Current Niobium Developments in High Carbon Steel Applications:** *Steven Jansto*<sup>1</sup>; <sup>1</sup>CBMM-Reference Metals Company

#### 8:20 AM

**Modeling the Effect of Nb on the Austenite to Ferrite Transformation Kinetics:** *Tao Jia*<sup>1</sup>; Matthias Militzer<sup>1</sup>; Fateh Fazeli<sup>1</sup>; <sup>1</sup>University of British Columbia

#### 8:40 AM

**Direct Observation of the Effect of Solute on Complex HSLA Steel Microstructures via In Situ TEM:** *Asher Leff*<sup>1</sup>; Michael Grimes<sup>2</sup>; Matthew Hartshorne<sup>1</sup>; Christopher Winkler<sup>1</sup>; Pello Uranga<sup>3</sup>; Mitra Taheri<sup>1</sup>; <sup>1</sup>Drexel University; <sup>2</sup>Lehigh University; <sup>3</sup>CEIT and TECNUN

#### 9:00 AM

**Kinetics of Nano Ti Carbides Precipitation:** Namhyun Kang<sup>1</sup>; Young-Ho Park<sup>1</sup>; Yang-Do Kim<sup>1</sup>; *Eunjun Chun*<sup>1</sup>; Sung Ju Kim<sup>2</sup>; Hyung Hyup Do<sup>2</sup>; Young Do Park<sup>3</sup>; <sup>1</sup>Pusan National University; <sup>2</sup>Hyundai steels; <sup>3</sup>Dong-Eui University

#### 9:20 AM

**Study on a New Type Surface Nitriding Steel Micro-Alloyed with Niobium:** *Ze-min Huang*<sup>1</sup>; Wenjie Hua<sup>1</sup>; Yang Li<sup>1</sup>; <sup>1</sup>Baoshan Iron & Steel Co., Ltd., Special Steel Division

#### 9:40 AM Break

#### 10:00 AM

**Investigation of Precipitation and Grain Boundaries in Ultra High Strength Steel with TEM and 3D Atom Probe:** *Matthew Hartshorne*<sup>1</sup>; Paul Novotny<sup>2</sup>; Michael Schmidt<sup>2</sup>; Mitra Taheri<sup>1</sup>; <sup>1</sup>Drexel University; <sup>2</sup>Carpenter Technology Corporation

#### 10:20 AM

**Effects of Nitrogen on Deformation Behavior of Austenitic High Nitrogen Steel:** *Byoungkoo Kim*<sup>1</sup>; T. T. T. Trang<sup>1</sup>; Nack J. Kim<sup>1</sup>; <sup>1</sup>GIFT

#### 10:40 AM

**Development and Characterization of ATI 216Cb\8482 Alloy, a Mo-Bearing Lean Austenitic Stainless Steel:** *David Bergstrom*<sup>1</sup>; <sup>1</sup>ATI Allegheny Ludlum

#### 11:00 AM

**Cooling Rate Dependence of Boron Distribution in Low Carbon Steel:** *Dong Jun Mun*<sup>1</sup>; Yang Mo Koo<sup>1</sup>; Eun Joo Shin<sup>2</sup>; Jae Sang Lee<sup>1</sup>; <sup>1</sup>Pohang University of Science and Technology; <sup>2</sup>Korea Atomic Energy Research Institute

#### 11:20 AM

**Model Development and Application of Stainless Steel Ingredient:** *wei zhuang*<sup>1</sup>; <sup>1</sup>baosteel,specialsteel

#### 11:40 AM Cancelled

**Effect of Boron Addition on Continuous Cooling Transformation and High Temperature Deformation Behavior of Al-Killed Low Carbon Steel:** *Nuntawat Chokechaitananan*<sup>1</sup>; Sorachai Pitakkoraras<sup>1</sup>; Takateru Umeda<sup>1</sup>; <sup>1</sup>Sahaviriya Steel Industries Public Co.,Ltd

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## Structural Materials for Aerospace and Defense: Challenges and Prospects: Composites and Nanocomposites

*Program Organizer:* Roumiana Petrova, New Jersey Institute of Tech

Wednesday AM                      Room: D242/243  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* Yellapu Murty, Cellular Materials International, Inc

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#### 8:00 AM Invited

**Lightweight, Multifunctional Composite for Aerospace Applications:** *Tiffany Miller*<sup>1</sup>; <sup>1</sup>Powdermet, Inc.



8:40 AM

**Aluminum SComp for Lightweight Structural and Energy Absorbing Applications:** *Brian Doud*<sup>1</sup>; <sup>1</sup>Powdermet Inc.

9:00 AM

**Unusual Hot Tearing Resistance Enhancement in Cast A206/Al<sub>2</sub>O<sub>3</sub> Nanocomposite:** *Hongseok Choi*<sup>1</sup>; Yi Sun<sup>1</sup>; Hiromi Konishi<sup>1</sup>; Xiaochun Li<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

9:20 AM

**Cast AZ91D/TiB<sub>2</sub> Nanocomposites with an Automatic Nanoparticle-Feeding System:** *Hongseok Choi*<sup>1</sup>; Yi Sun<sup>1</sup>; Ben Slater<sup>1</sup>; Xiaochun Li<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

9:40 AM Break

10:00 AM Invited

**Ti<sub>2</sub>AlC-Nanocrystalline Mg-Matrix Composites with Ultrahigh Damping, Stiffnesses and Strengths:** *Michel Barsoum*<sup>1</sup>; Babak Anasori<sup>1</sup>; <sup>1</sup>Drexel University

10:40 AM

**Development of Ti-TiAl<sub>3</sub> Metallic-Intermetallic Laminate Composites for Structural, Defense, and Aerospace Applications:** *Derrick Stokes*<sup>1</sup>; Xiu-Ren Bu<sup>2</sup>; Jennifer Conway<sup>1</sup>; Stan Jones<sup>1</sup>; Viola Acoff<sup>1</sup>; <sup>1</sup>The University of Alabama; <sup>2</sup>Clark Atlanta University

11:00 AM

**Current NDE Studies of Impact Damage in Multi-Layered Transparent Panel Structures:** *William Green*<sup>1</sup>; Raymond Brennan<sup>1</sup>; <sup>1</sup>U.S. Army Research Laboratory

11:20 AM

**Thermo-Mechanical Properties of Epoxy Based Shape Memory Polymers:** *Haluk Karaca*<sup>1</sup>; Burak Basaran<sup>1</sup>; Mohammed Souiri<sup>1</sup>; Anil Erol<sup>1</sup>; <sup>1</sup>UNIVERSITY OF KENTUCKY

11:40 AM

**Novel Ti<sub>2</sub>AlNb-Based Intermetallic Alloys and Composites:** *Marat Shagiev*<sup>1</sup>; <sup>1</sup>Institute for Metals Superplasticity Problems

12:00 PM

**Extreme Anelastic Responses in Zn<sub>80</sub>Al<sub>20</sub> Matrix Composite Materials Containing BaTiO<sub>3</sub> Inclusion:** *Liang Dong*<sup>1</sup>; Donald Stone<sup>1</sup>; Roderic Lakes<sup>1</sup>; <sup>1</sup>University of Wisconsin, Madison

12:20 PM Cancelled

**Characterization of TiB<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub>-TiB<sub>2</sub> Composites on the MISSE-6 Mission:** *Eric Faierson*<sup>1</sup>; Kathryn Logan<sup>2</sup>; Sharon Jefferies<sup>3</sup>; <sup>1</sup>National Institute of Aerospace - Virginia Tech; <sup>2</sup>Virginia Tech; <sup>3</sup>NASA Langley Research Center

## Surface Properties of Biomaterials: Antimicrobial Coatings and Surface Analysis

**Program Organizers:** Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Thomas Webster, Brown University; Sharmila Mukhopadhyay, Wright State University; Paul Calvert, University of Massachusetts; Mukesh Kumar, Biomet Inc

Wednesday AM  
October 19, 2011

Room: C216  
Location: Columbus Con. Center

**Session Chairs:** Amit Bandyopadhyay, Washington State University; Pranesh Aswath, University of Texas at Arlington

8:00 AM Invited

**Surface Modification of Microneedles Using Pulsed Laser Deposition:** *Roger Narayan*<sup>1</sup>; Shaun Gittard<sup>1</sup>; Nancy Monteiro-Riviere<sup>2</sup>; Aleksandr Ovsianikov<sup>3</sup>; Boris Chichkov<sup>3</sup>; Bret Chisholm<sup>4</sup>; Shane Stafslie<sup>4</sup>; <sup>1</sup>Univ of North Carolina & North Carolina State Univ; <sup>2</sup>North Carolina State Univ; <sup>3</sup>Laser Zentrum Hannover e.V.; <sup>4</sup>North Dakota State University

8:40 AM

**Anti-Bacterial and Biological Properties of Plasma Sprayed Silver-Doped Hydroxyapatite Coating:** *Mangal Roy*<sup>1</sup>; Gary Fielding<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; Susmita Bose<sup>1</sup>; <sup>1</sup>Washington State University

9:00 AM

**Improving the Resistance of Ceramic Surfaces to Biofilm Formation:** *Curtis Larimer*<sup>1</sup>; Ian Nettleship<sup>1</sup>; Anil Ojha<sup>1</sup>; <sup>1</sup>University of Pittsburgh

9:20 AM

**Anti-Bacterial and Biological Properties of Plasma Sprayed Strontium and Silver Doped Hydroxyapatite Coatings:** *Gary Fielding*<sup>1</sup>; Mangal Roy<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; Susmita Bose<sup>1</sup>; <sup>1</sup>Washington State University

9:40 AM Break

10:00 AM Invited

**Nature Inspired Hierarchical Surfaces for Biomedical Devices:** *Sharmila Mukhopadhyay*<sup>1</sup>; Elizabeth Maurer<sup>2</sup>; Adam Maleszewsky<sup>1</sup>; Ian Barney<sup>1</sup>; Saber Hussain<sup>2</sup>; <sup>1</sup>Wright State University; <sup>2</sup>Air Force Research Laboratory

10:20 AM

**Antimicrobial Properties of Copper and Its Alloy:** *David Esezobor*<sup>1</sup>; Samuel Fatoba<sup>1</sup>; John Etudor<sup>1</sup>; Solomon Macgregor<sup>1</sup>; <sup>1</sup>University of Lagos

10:40 AM

**Structure of Trabecular Bone in DMP-1 Deficient Knock Out Mice and Wild Type Mice:** *Megen Velten*<sup>1</sup>; Paul Dechow<sup>2</sup>; Jian Feng<sup>2</sup>; Pranesh Aswath<sup>1</sup>; <sup>1</sup>University of Texas at Arlington; <sup>2</sup>Baylor College of Dentistry

11:00 AM

**The Role of Bacterial Attachment to Metal Substrate and Its Effects on Microbiologically Influenced Corrosion (MIC) in Transporting Hydrocarbon Pipelines:** *Faisal Al-Abbas*<sup>1</sup>; Arshad Bajvani Gavanluei<sup>2</sup>; David Olson<sup>2</sup>; Brajendra Mishra<sup>2</sup>; John Spear<sup>2</sup>; Anthony Kakpopovie<sup>1</sup>; <sup>1</sup>Saudi Aramco; <sup>2</sup>Colorado School of Mines

11:20 AM

**XPS and Cellular Characterization of Surface Anodized Titanium Alloys for Dental Implant Applications:** *Rahul Bhola*<sup>1</sup>; Reed Ayers<sup>1</sup>; Brajendra Mishra<sup>2</sup>; David Olson<sup>1</sup>; Timothy Ohno<sup>1</sup>; <sup>1</sup>Colorado School of Mines

11:40 AM Cancelled

**Surface Analysis of a Beta-Titanium Biomaterial:** *Kallen Konen*<sup>1</sup>; Keeley Floreen<sup>1</sup>; K.V. Sudhakar<sup>1</sup>; <sup>1</sup>Montana Tech

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## Surface Protection for Enhanced Materials Performance: Science and Technology: Advanced Processing/Multi-Functional Coatings I

*Program Organizers:* Rodney Trice, Purdue University; Dongming Zhu, NASA Glenn Research Center; Daniel Mumm, University of California-Irvine; Hua-Tay Lin, Oak Ridge National Laboratory; Pravansu Mohanty, University of Michigan; Yutaka Kagawa, The University of Tokyo; Kang Lee, Rolls Royce; Charles Kay, ASB Industries, Inc.; Luc Pouliot, TECNAR Automation Ltd.

Wednesday AM  
October 19, 2011

Room: D230  
Location: Columbus Con. Center

*Session Chairs:* Luc Pouliot, TECNAR Automation Ltd.; Charles Kay, ASM Industries

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### 8:00 AM Invited

**Upcoming Global Opportunities and Challenges in the Thermal Spray Industry:** *Mitchell Dorfman*<sup>1</sup>; <sup>1</sup>Sulzer Metco (US) Inc.

### 8:40 AM

**Doped Solid Oxide Fuel Cell Electrolytes Produced via a Combination of Suspension Plasma Spray and Very Low Pressure Plasma Spray:** *James Fleetwood*<sup>1</sup>; Elliott Slamovich<sup>1</sup>; Rodney Trice<sup>1</sup>; Aaron Hall<sup>2</sup>; James McCloskey<sup>2</sup>; <sup>1</sup>Purdue University; <sup>2</sup>Sandia National Laboratory

### 9:00 AM

**Composite Powders for Thermal Spray Applications:** *Greg Engleman*<sup>1</sup>; Joshua Caris<sup>1</sup>; Andrew Sherman<sup>1</sup>; Curtis Glasgow<sup>1</sup>; John Formica<sup>1</sup>; MesoCoat

### 9:20 AM

**Aerospace Coatings via Directed Vapor Deposition:** *Balvinder Gogia*<sup>1</sup>; Derek Hass<sup>1</sup>; <sup>1</sup>Directed Vapor Technologies Intl.

### 9:40 AM Break

### 10:00 AM Invited

**Cold Spray Technology:** *Jegan Karthikeyan*<sup>1</sup>; <sup>1</sup>ASB Industries

### 10:40 AM

**A Study on Friction Surfaced Coating of Niobium Stabilized Austenitic Stainless Steel on Mild Steel Substrate:** *Ramesh Puli*<sup>1</sup>; Janaki Ram G D<sup>1</sup>; <sup>1</sup>IIT Madras

### 11:00 AM

**Low Temperature Plasma Assisted Carburizing of AISI 420 Martensitic Stainless Steel: Influence of Process Parameters on the Treated Surface Properties:** Cristiano Scheuer<sup>1</sup>; Rodrigo Cardoso<sup>1</sup>; Ricardo Pereira<sup>1</sup>; *Silvio Brunatto*<sup>1</sup>; <sup>1</sup>Universidade Federal do Paraná - UFPR

### 11:20 AM

**Effect of Al on the Kinetics of Carburizing of a NiCrMo Coating:** Karin Graf<sup>1</sup>; *Ana Sofia D'Oliveira*<sup>1</sup>; <sup>1</sup>UFPR - Federal University of Paraná

### 11:40 AM

**Laser Cladding of Fe Based Amorphous Powder on Steel: A Microstructural and Thermal Modeling Study:** *Shravana Katakam*<sup>1</sup>; Sameer Paital<sup>1</sup>; Junyeon Hwang<sup>1</sup>; Rajarshi Banerjee<sup>1</sup>; Narendra Dahotre<sup>1</sup>; <sup>1</sup>University of North Texas

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## ACerS Robert B. Sosman Lecture

Wednesday PM  
October 19, 2011

Room: C113/114  
Location: Columbus Con. Center

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### 1:00 PM

**Interface Structure Dependent Microstructural Evolution in Ceramics:** *Suk-Joong L. Kang*<sup>1</sup>; <sup>1</sup>KAIST

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## Additive Manufacturing of Metals: Electron Beam Melting (EBM) II

*Program Organizers:* Ian D. Harris, EWI; Ulf Ackelid, Arcam AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, Ohio State University; Brent Stucker, University of Louisville

Wednesday PM  
October 19, 2011

Room: D130  
Location: Columbus Con. Center

*Session Chair:* Ola Harrysson, University of North Carolina

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### 2:00 PM

**Development of EBM Process Parameters for High Purity Copper Applications:** *Pedro Frigola*<sup>1</sup>; Ola Harrysson<sup>2</sup>; Kyle Knowlson<sup>2</sup>; Tim Horn<sup>2</sup>; Frank Medina<sup>3</sup>; Ryan Wicker<sup>3</sup>; Lawrence Murr<sup>3</sup>; Diana Ramirez<sup>3</sup>; <sup>1</sup>RadiaBeam Technologies; <sup>2</sup>NCSU; <sup>3</sup>UTEP

### 2:20 PM

**Electron Beam Melting: The New Directional Solidification:** *Edwin Martinez*<sup>1</sup>; Lawrence Murr<sup>1</sup>; Sara Gaytan<sup>1</sup>; Diana Ramirez<sup>1</sup>; Francisco Medina<sup>1</sup>; Ryan Wicker<sup>1</sup>; <sup>1</sup>University of Texas at El Paso

### 2:40 PM

**Influence of Interstitial Elements on the Mechanical Properties of Ti-6Al-4V Produced with Electron Beam Melting:** *Mattias Svensson*<sup>1</sup>; *Ulf Ackelid*<sup>1</sup>; <sup>1</sup>Arcam AB

### 3:00 PM

**Process Mapping of Melt Pool Dimension Control in Electron Beam Additive Manufacturing:** *Jack Beuth*<sup>1</sup>; Emre Can Soylemez<sup>1</sup>; Karen Taminger<sup>2</sup>; Bryant Walker<sup>3</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>NASA Langley Research Center; <sup>3</sup>Keystone Synergistic Enterprises

### 3:20 PM Break

### 4:00 PM

**Control of Melt Pool Dimensions in the Building of Thin-Walled Structures by Electron Beam Additive Manufacturing:** *Piyapong (Pete) Reesewat*<sup>1</sup>; Jack Beuth<sup>1</sup>; Karen Taminger<sup>2</sup>; Bryant Walker<sup>3</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>NASA Langley Research Center; <sup>3</sup>Keystone Synergistic Enterprises

### 4:20 PM

**Toward Integrated Control of Melt Pool Dimensions and Microstructure in Electron Beam Additive Manufacturing:** *Joy Davis*<sup>1</sup>; Jack Beuth<sup>1</sup>; Nathan Klingbeil<sup>2</sup>; Bryant Walker<sup>3</sup>; Karen Taminger<sup>4</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Wright State University; <sup>3</sup>Keystone Synergistic Enterprises; <sup>4</sup>NASA Langley Research Center

### 4:40 PM

**Transient Melt Pool Response in Electron Beam Additive Manufacturing:** *Jason Fox*<sup>1</sup>; Jack Beuth<sup>1</sup>; Bryant Walker<sup>2</sup>; Karen Taminger<sup>3</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Keystone Synergistic Enterprises; <sup>3</sup>NASA Langley Research Center

5:00 PM

**Powder Removal from Complex Structures Produced Using Electron Beam Melting:** *David Trinh<sup>1</sup>; Isak Elfström<sup>1</sup>; Arcam AB*

5:20 PM

**Influence of Powder Size and Layer Thickness on the Properties of Ti-6Al-4V Lattice Structures Manufactured by Electron Beam Melting:** *Sanna Fager Franzén<sup>1</sup>; Isak Elfström<sup>1</sup>; Mattias Svensson<sup>1</sup>; Ulf Ackelid<sup>1</sup>; David Trinh<sup>1</sup>; Arcam AB*

## Advanced Developments in Electron Microscopy: In-Situ Techniques

**Program Organizers:** Lawrence Allard, Oak Ridge National Laboratory; Velimir Radmilovic, Lawrence Berkeley National Laboratory; Paulo Ferreira, University of Texas at Austin; Daniel Ugarte, Universidade Estadual de Campinas - UNICAMP

Wednesday PM  
October 19, 2011

Room: E160A  
Location: Columbus Con. Center

**Session Chair:** Jingyue Liu, University of Missouri-St. Louis

2:00 PM

**In-Situ TEM Observation of Solid to Vapor Phase Transitions in Silver Nanoparticles:** *Michael Asoro<sup>1</sup>; Desiderio Kovar<sup>1</sup>; Paulo Ferreira<sup>1</sup>; University of Texas at Austin*

2:20 PM

**In-Situ TEM Study of Sintering of Capped Silver Nanoparticles:** *Michael Asoro<sup>1</sup>; Desiderio Kovar<sup>1</sup>; Paulo Ferreira<sup>1</sup>; University of Texas at Austin*

2:40 PM Invited

**In Situ TEM Imaging of Functional Nanoparticles in Liquids:** *Kate Klein<sup>1</sup>; Ian Anderson<sup>1</sup>; National Institute of Standards and Technology*

3:20 PM Break

4:00 PM Invited

**The Versatility of In-Situ Environmental Fluid Cells for Materials Science Research:** *Raymond Unocic<sup>1</sup>; Daan Hein Alsem<sup>2</sup>; Norman Salmon<sup>2</sup>; Miaofang Chi<sup>1</sup>; Gabriel Veith<sup>1</sup>; Leslie Adamczyk<sup>1</sup>; Nancy Dudley<sup>1</sup>; Karren More<sup>1</sup>; Oak Ridge National Laboratory; Hummingbird Scientific*

4:40 PM

**Recent Developments in In Situ Studies of Catalytic Materials at Atomic Resolution Using a New Environmental Cell Gas Reaction Technology:** *Lawrence Allard<sup>1</sup>; Wilbur Bigelow<sup>2</sup>; David Nackashi<sup>3</sup>; John Damiano<sup>3</sup>; Oak Ridge National Laboratory; University of Michigan; Protochips Inc.*

5:00 PM

**In Situ Phase Transformation Investigations of FePt Nanoparticles with Z-STEM Imaging:** *James Wittig<sup>1</sup>; Larry Allard<sup>2</sup>; Vanderbilt University; Oak Ridge National Laboratory*

5:20 PM

**In Situ HRTEM on Tensile Experiment with Metallic Nanowires:** *Scott Mao<sup>1</sup>; He Zheng<sup>1</sup>; Jianyu Huang<sup>2</sup>; University of Pittsburgh; Sandia National Lab*

## Advances in Dielectric Materials and Electronic Devices: Materials and Applications II

**Program Organizer:** K. M. Nair, E.I.duPont de Nemours & Co, Inc

Wednesday PM  
October 19, 2011

Room: C220  
Location: Columbus Con. Center

**Session Chairs:** R Ubic, Boise State University; X Pan, University of Michigan

2:00 PM

**Comparison of Electrical Characteristics of AlN-on-Diamond and AlN-on-Si MIS Diodes:** *Nirmal Govindaraju<sup>1</sup>; Dibakar Das<sup>1</sup>; Peter Kosel<sup>1</sup>; Raj Singh<sup>1</sup>; University of Cincinnati*

2:20 PM

**Development and Optimization of Integrated Piezoelectric PZT/LTCC Micropumps:** *Wenli Zhang<sup>1</sup>; Richard Eitel<sup>1</sup>; University of Kentucky*

2:40 PM

**Evaluation of Electroactive Polymer (EAP) Concept to Enhance Respirator Facial Seal:** *Mark Stasik<sup>1</sup>; Jay Sayre<sup>1</sup>; Rachel Thurston<sup>1</sup>; Wes Childers<sup>1</sup>; Aaron Richardson<sup>1</sup>; Megan Moore<sup>1</sup>; Paul Gardner<sup>2</sup>; Battelle; Edgewood Chemical Biological Center*

3:00 PM Invited

**Long-Term and Light Stimulated Evolution of Semiconductor Properties:** *Sergei Pyshkin<sup>1</sup>; John Ballato<sup>2</sup>; Raisa Zhitaru<sup>1</sup>; George Chumanov<sup>2</sup>; Donald VanDerveer<sup>2</sup>; Academy of Sciences of Moldova; Clemson University*

3:20 PM Break

4:00 PM

**Thermophysical Properties of Piezocrystal Materials:** *Adam Heitmann<sup>1</sup>; Richard Perez-Moyet<sup>1</sup>; George Rossetti<sup>1</sup>; University of Connecticut*

4:20 PM Invited

**Time-Resolved Imaging of Ferroelectric Switching:** *Xiaoqing Pan<sup>1</sup>; Chris Nelson<sup>1</sup>; Peng Gao<sup>1</sup>; Benjamin Winchester<sup>2</sup>; Carolina Adamo<sup>3</sup>; Chad Folkman<sup>4</sup>; Chang-Beom Eom<sup>4</sup>; Darrell Schlom<sup>3</sup>; Long-Qing Chen<sup>2</sup>; University of Michigan; Penn State University; Cornell University; University of Wisconsin - Madison*

4:40 PM

**Numerical Simulations for the Effect of the Localized Temperature during a Back Grinding Process for TSV Wafers:** *Ahmed Abdelnaby<sup>1</sup>; Gabriel Potirniche<sup>1</sup>; Fred Barlow<sup>1</sup>; Aicha Elshabini<sup>1</sup>; Randy Parker<sup>2</sup>; University of Idaho; Micron Technologies Inc.*

5:00 PM Cancelled

**Long-Time Photoluminescence Decay in Quantum Dot Samples:** *Karel Kral<sup>1</sup>; Inst. Phys. ASCR, v.v.i.*

## AIST Adolf Martens Memorial Steel Lecture

**Program Organizer:** Stephanie Will, The Timken Company

Wednesday PM  
October 19, 2011

Room: D131  
Location: Columbus Con. Center

1:00 PM Invited

**A Metallurgical Perspective of the Role of Rail Steel in the Growth of America:** *Bruce Bramfitt<sup>1</sup>; ArcelorMittal-Steelton*

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## Ceramic Matrix Composites: Modeling/Characterization

*Program Organizers:* Narottam Bansal, NASA Glenn Research Center; J. P. Singh, U.S. Army Research Laboratory; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Wednesday PM                      Room: C112  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* Jacques Lamon, CNRS

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### 2:00 PM Invited

**Multiscale Approach to Lifetime Prediction for Woven Fiber Reinforced Ceramic Matrix Composites:** *Jacques Lamon*<sup>1</sup>; <sup>1</sup>CNRS

### 2:40 PM

**Effect of Microstructure on Properties of HfB<sub>2</sub>-SiC:** *Sylvia Johnson*<sup>1</sup>; Matthew Gasch<sup>1</sup>; Michael Gusman<sup>2</sup>; Margaret Stackpoole<sup>2</sup>; <sup>1</sup>NASA-Ames Research Center; <sup>2</sup>ERC Inc

### 3:00 PM

**High Temperature Furnace Door Test for Wollastonite Based Chemically Bonded Phosphate Ceramics with Different Reinforcements:** *H. A. Colorado*<sup>1</sup>; J-M Yang<sup>1</sup>; <sup>1</sup>University of California, Los Angeles

### 3:20 PM Break

### 4:00 PM

**Processing-Microstructure-Property Relations of Pressureless Sintered ZrB<sub>2</sub>-SiC Composites:** *Sabyasachi Roy*<sup>1</sup>; Manab Mallik<sup>1</sup>; Kalyan Ray<sup>1</sup>; *Rahul Mitra*<sup>1</sup>; <sup>1</sup>Indian Institute of Technology

### 4:20 PM

**Stress Wave Management in Alumina (Al<sub>2</sub>O<sub>3</sub>) 3D Ceramic Laminated Composite Systems:** *Christian Espinoza Santos*<sup>1</sup>; Waltraud Kriven<sup>1</sup>; Kevin Brittain<sup>1</sup>; Daniel Tortorelli<sup>1</sup>; <sup>1</sup>The University of Illinois at Urbana Champaign

### 4:40 PM

**Structural and Compositional Investigations of Ceramic-Metallic Composites Produced by Reactive Metal Penetration in Molten Al and Al-Fe Alloy:** *Anthony Yurcho*<sup>1</sup>; Klaus-Markus Peters<sup>2</sup>; Brian Hetzel<sup>2</sup>; Matthias Zeller<sup>1</sup>; Raymond Brennan<sup>3</sup>; Timothy Wagner<sup>1</sup>; *Virgil Solomon*<sup>1</sup>; <sup>1</sup>Youngstown State University; <sup>2</sup>Fireline TCON, Inc.; <sup>3</sup>U.S. Army Research Laboratory

### 5:00 PM

**Giant Anelastic Responses in (BaZrO<sub>3</sub>-ZnO)-BaTiO<sub>3</sub> Composite Materials:** *Liang Dong*<sup>1</sup>; Roderic Lakes<sup>1</sup>; Donald Stone<sup>1</sup>; <sup>1</sup>University of Wisconsin, Madison

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## Characterization and Modeling of the Performance of Advanced Alloys for the Transportation Industry -- Bridging the Data Gap II: Evaluating the Performance of Advanced Lightweight Alloys II

*Program Organizers:* Mark Stoudt, National Institute of Standards and Technology; Adam Creuziger, National Institute of Standards and Technology; John Carsley, General Motors; Michael Miles, BYU; Kip Findley, Colorado School of Mines

Wednesday PM                      Room: D131  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* Adam Creuziger, NIST

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### 2:00 PM

**Microstructure Simulation of Magnesium for Engineering Property Prediction:** *Erin Barker*<sup>1</sup>; Dongsheng Li<sup>1</sup>; Xin Sun<sup>1</sup>; Mohammad Khaleel<sup>1</sup>; John Allison<sup>2</sup>; Mei Li<sup>3</sup>; <sup>1</sup>Pacific Northwest National Lab; <sup>2</sup>University of Michigan; <sup>3</sup>Ford Motor Company

### 2:20 PM

**Microstructure Evolution of Wrought Thixomolded Mg Alloy Sheet:** *Tracy Berman*<sup>1</sup>; William Donlon<sup>1</sup>; Victoria Miller<sup>1</sup>; Raymond Decker<sup>2</sup>; Jack Huang<sup>2</sup>; Tresa Pollock<sup>3</sup>; J. Wayne Jones<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>nanoMAG, LLC.; <sup>3</sup>University of California, Santa Barbara

### 2:40 PM Break

### 3:20 PM

**An Efficient Test to Reveal the Temperature-Dependence of Deformation Mechanisms:** *Kun Piao*<sup>1</sup>; Robert Wagoner<sup>1</sup>; <sup>1</sup>OSU

### 3:40 PM

**Creep Behavior of Peak-Aged Mg-11Y-5Gd-2Zn-0.5Zr (wt.%) Alloy for Engine Piston Applications:** *Dongdi Yin*<sup>1</sup>; Qudong Wang<sup>1</sup>; C.J. Boehlert<sup>2</sup>; <sup>1</sup>Shanghai Jiao Tong University; <sup>2</sup>Michigan State University

### 4:00 PM

**Creep Behaviors of Extruded and Rolled AZ80 Mg Alloy:** *Jun Qiao*<sup>1</sup>; Yu Wang<sup>1</sup>; <sup>1</sup>The University of Science and Technology Liaoning

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## Controlled Synthesis, Processing and Applications of Structural and Functional Nanomaterials: Three Dimensional Nanomaterials I

*Program Organizers:* Kathy Lu, Virginia Tech; Xudong Wang, University of Wisconsin - Madison; Eugene Olevsky, San Diego State University; Gurpreet Singh, Kansas State University; Nitin Chopra, The University of Alabama; Pu-Xian Gao, University of Connecticut; Jianyu Liang, Worcester Polytechnic Institute

Wednesday PM                      Room: C123  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* Xudong Wang, University of Wisconsin-Madison

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### 2:00 PM Invited

**Rational Tailoring of 1-D (Nanowires), 2-D (Graphene) and 3-D (Ceramic/Carbon Nanotubes Composites) Functional and Structural Nanomaterials:** *Nitin Padture*<sup>1</sup>; <sup>1</sup>The Ohio State University

### 2:40 PM

**3D TiO<sub>2</sub> Nanoarchitecture Fabricated by Pulsed Chemical Vapor Deposition:** *Jian Shi*<sup>1</sup>; Xudong Wang<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

3:00 PM

**A New Multifunctional Covalent-Integrated Epoxy Composites Fabricated by Ionic Liquid Functional Carbon Nanotubes:** *zhe wang*<sup>1</sup>; Hansang Kim<sup>1</sup>; Tomas Hahn<sup>1</sup>; <sup>1</sup>UCLA

3:20 PM Break

4:00 PM Invited

**Approaching Multimaterial 3D Nanostructured Gas Phase Nanoxerographic Printers:** *Heiko Jacobs*<sup>1</sup>; <sup>1</sup>University of Minnesota

4:40 PM

**Direct Synthesis of ZnO Nanorod Field Emitters on Metal Electrodes:** *Gregory Wrobel*<sup>1</sup>; Marcin Piech<sup>2</sup>; Pu-Xian Gao<sup>1</sup>; Sameh Dardona<sup>2</sup>; <sup>1</sup>University of Connecticut; <sup>2</sup>United Technologies Research Center

5:00 PM

**A Novel Method for Manufacturing Aluminum-Aluminum Nitride Nanocomposites:** *Makhlouf Makhlouf*<sup>1</sup>; *Cecilia Borgonovo*<sup>1</sup>; <sup>1</sup>WPI

5:20 PM

**Quantifying the Kinetic Transition in the Growth of Nanocrystals in Al-Sm Alloys:** *Seth Imhoff*<sup>1</sup>; John Perepezko<sup>1</sup>; Paul Evans<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

## Corrosion Protection through Metallic and Non-Metallic Coatings: Polymeric and Conversion Coatings

*Program Organizers:* Narasi Sridhar, DNV; Rudolph Buchheit, Ohio State University

Wednesday PM  
October 19, 2011

Room: D244/245  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

2:00 PM

**Corrosion Resistant Coatings Derived from Cooperative Chemical Inhibition by Zn<sup>2+</sup> and Vanadates and Inhibitor Delivery by Synthetic Ion Exchange Compounds:** *Rudolph Buchheit*<sup>1</sup>; <sup>1</sup>Ohio State University

2:40 PM

**Corrosion Inhibition of AA 2024-T3 by Aqueous Silicate, Molybdate, and Praseodymium Species:** *Omar Lopez-Garrity*<sup>1</sup>; <sup>1</sup>The Ohio State University

3:00 PM

**Corrosion Inhibition of a Hybrid Organic/Inorganic Coating by Release on Demand:** *Nay Win Khun*<sup>1</sup>; Saikat Adhikari<sup>1</sup>; Yi-Yun Li<sup>1</sup>; Gerald Frankel<sup>1</sup>; Brian Bammel<sup>2</sup>; Thomas Smith<sup>2</sup>; John McGee<sup>2</sup>; John Comoford<sup>2</sup>; John Zimmerman<sup>2</sup>; Gregory Donaldson<sup>2</sup>; <sup>1</sup>Ohio State University; <sup>2</sup>Henkel Corp.

3:20 PM

**Simulations Guided Design of Anti-Corrosion Coatings for Al Alloys by Selective Targeting of Intermetallic Particles:** *Jie Xiao*<sup>1</sup>; Hyunwook Kwak<sup>1</sup>; Thomas Chastek<sup>1</sup>; *Santanu Chaudhuri*<sup>1</sup>; <sup>1</sup>Washington State University

3:40 PM

**Study of Corrosion Inhibitors on Aluminum Alloy Al 2024-T3:** *Jaspreet Singh*<sup>1</sup>; Jude Iroh<sup>1</sup>; <sup>1</sup>UNIVERSITY OF CINCINNATI

4:00 PM

**Conversion Coatings for the Corrosion Protection of Magnesium:** *Nick Birbilis*<sup>1</sup>; X.-B. Chen<sup>1</sup>; T.B. Abbott<sup>2</sup>; M.A. Easton<sup>1</sup>; <sup>1</sup>Monash University; <sup>2</sup>Advanced Magnesium Technologies

4:20 PM Break

4:30 PM

**Sulfur-Resistant Silicone Conformal Coatings:** *Barry Hindin*<sup>1</sup>; Steve Risser<sup>1</sup>; <sup>1</sup>Battelle

4:50 PM

**Corrosion Detection, Inspection and Correction of Water Systems Piping:** *James Lary*<sup>1</sup>; <sup>1</sup>Corpro Companies, Inc.

5:10 PM

**Improvement of Corrosion Behavior of Al-Si Eutectic Alloy by Cerium-Based Conversion Coatings:** *Carlos Castano*<sup>1</sup>; Surender Maddela<sup>1</sup>; William Fahrenholtz<sup>1</sup>; Matthew O'Keefe<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology

## Deformation and Transitions at Grain Boundaries: Nanocrystalline Grain Boundary Processes

*Program Organizers:* Thomas Bieler, Michigan State University; Douglas Spearot, University of Arkansas; Rozaliya Barabash, Oak Ridge National Laboratory; Shen Dillon, University of Illinois at Urbana-Champaign; Jian Luo, Clemson University

Wednesday PM  
October 19, 2011

Room: C121  
Location: Columbus Con. Center

*Session Chairs:* Douglas Spearot, University of Arkansas; Dmitri Molodov, RWTH Aachen University

2:00 PM Invited

**Grain Boundary Mediated Deformation in Nanocrystalline NiFe Alloys under Dynamic and Cyclic Loading:** *Yonghao Zhao*<sup>1</sup>; S. Cheng<sup>2</sup>; Y.Z. Guo<sup>3</sup>; Y.M. Wang<sup>4</sup>; Y. Li<sup>1</sup>; Q.M. Wei<sup>3</sup>; X.-L. Wang<sup>3</sup>; P.K. Liaw<sup>2</sup>; E.J. Lavernia<sup>1</sup>; <sup>1</sup>University of California Davis; <sup>2</sup>University of Tennessee, Knoxville, USA; <sup>3</sup>University of North Carolina, Charlotte; <sup>4</sup>Lawrence Livermore National Laboratory, Livermore; <sup>5</sup>Oak Ridge National Laboratory, Oak Ridge

2:20 PM Invited

**Grain Boundary Relaxation and the Plastic Deformation of Nanocrystalline Alloys:** Timothy Rupert<sup>1</sup>; *Christopher Schuh*<sup>1</sup>; <sup>1</sup>MIT

2:40 PM

**Grain Boundary-Mediated Plastic Deformation in Nanocrystalline Metals:** *Scott Mao*<sup>1</sup>; <sup>1</sup>University of Pittsburgh

3:00 PM

**Molecular Dynamics Simulations of Plastic Deformation in Dopant-Modified Nanocrystalline Metallic Materials:** *Douglas Spearot*<sup>1</sup>; Lucas Brown<sup>1</sup>; <sup>1</sup>University of Arkansas

3:20 PM Break

4:00 PM

**Local Deformation Tracking at the Microstructural Level in Coarse and Ultrafine-Grained Metals:** *Adam Kammer*<sup>1</sup>; Samantha Daly<sup>1</sup>; <sup>1</sup>The University of Michigan

4:20 PM Invited

**Shear-Coupled Stress Driven Grain Boundary Migration:** *Dmitri Molodov*<sup>1</sup>; Tatiana Gorkaya<sup>1</sup>; Günter Gottstein<sup>1</sup>; <sup>1</sup>RWTH Aachen University

4:40 PM

**Deformation Twinning in Nanocrystalline Mo-Molecular Dynamics Simulations:** *Yongfeng Zhang*<sup>1</sup>; Paul Millett<sup>1</sup>; Michael Tonks<sup>1</sup>; Bulent Biner<sup>1</sup>; Liangzhe Zhang<sup>1</sup>; Karthikeyan Chockalingam<sup>1</sup>; <sup>1</sup>Idaho National Lab



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## Energy Conversion/Fuel Cells: Interconnect Coatings

*Program Organizers:* Matthew Seabaugh, NexTech Materials, Ltd.; Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Meilin Liu, Georgia Institute of Technology

Wednesday PM                      Room: C224  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* To Be Announced

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### 2:00 PM

**Experimental Characterization of Manganese Cobalt Oxide (MCO) Coatings on Fuel Cell Interconnects:** *Sajedur Akanda*<sup>1</sup>; Mark Walter<sup>1</sup>; <sup>1</sup>The Ohio State University

### 2:20 PM

**Ceramic and Glass Composite Interconnects for Solid Oxide Fuel Cells:** Seung-Bok Lee<sup>1</sup>; Seuk-Hoon Pi<sup>1</sup>; *Jong-Won Lee*<sup>1</sup>; Tak-Hyoung Lim<sup>1</sup>; Seok-Joo Park<sup>1</sup>; Rak-Hyun Song<sup>1</sup>; Dong-Ryul Shin<sup>1</sup>; <sup>1</sup>Korea Institute of Energy Research

### 2:40 PM

**High Performance Oxide Protective Coatings for SOFC Components:** *Matthew Seabaugh*<sup>1</sup>; Sergio Ibanez<sup>2</sup>; Kellie Chenault<sup>1</sup>; Neil Kidner<sup>1</sup>; Michael Day<sup>1</sup>; Lora Thrun<sup>1</sup>; <sup>1</sup>NexTech Materials, Ltd.

### 3:00 PM

**Manganese Cobalt Spinel Oxide Based Coatings for SOFC Interconnects:** *Jeffrey Fergus*<sup>1</sup>; Yingjia Liu<sup>1</sup>; Yu Zhao<sup>1</sup>; <sup>1</sup>Auburn University

### 3:20 PM Break

### 4:00 PM

**The Effect of MnCoO-CeO Spinel Coating Thickness on Electrical Conductivity at Long-Term SOFC Operating Condition:** *Jung Pyung Choi*<sup>1</sup>; Jeff Stevenson<sup>1</sup>; Ryan Scott<sup>1</sup>; Matt Chou<sup>1</sup>; <sup>1</sup>Pacific Northwest National Laboratory

### 4:20 PM

**Interfacial Interactions of Electrolyte-(La<sub>0.8</sub>Sr<sub>0.2</sub>)xMnO<sub>3</sub>-Interconnect Tri-Layer for Solid Oxide Fuel Cells:** *Kathy Lu*<sup>1</sup>; Tongan Jin<sup>1</sup>; <sup>1</sup>Virginia Tech

### 4:40 PM

**Study on Heteropolyacids/Ti/Zr Mixed in the Inorganic Composites for Fuel Cell Electrolytes:** *Uma Thanganathan*<sup>1</sup>; <sup>1</sup>Okayama University

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## Energy Storage: Materials, Systems and Applications: Energy Storage for Transportation Applications III

*Program Organizers:* Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Terry Holesinger, Los Alamos National Laboratory; Xingbo Liu, West Virginia University; Chun Lu, Siemens Energy, Inc.

Wednesday PM                      Room: C223  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* Xiaochuan Lu, Pacific Northwest National Laboratory

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### 2:00 PM

**Synthesis of LiCoO<sub>2</sub> Cathodes for Li-Ion Batteries via Solution Precursor Plasma Process:** *Raghavender Tummala*<sup>1</sup>; RAMESH K. GUDURU<sup>1</sup>; PRAVANSU S. MOHANTY<sup>1</sup>; <sup>1</sup>Univ of Michigan

### 2:20 PM Invited

**Nanostructured Electrodes for High-Performance Supercapacitors:** Min-Kyu Song<sup>1</sup>; Shuang Cheng<sup>1</sup>; Wentao Qin<sup>1</sup>; *Meilin Liu*<sup>1</sup>; <sup>1</sup>Georgia Institute of Technology

### 3:00 PM Break

### 3:20 PM

**Development of Hybrid Supercapacitors for Portable Power Applications:** *Elvin Beach*<sup>1</sup>; Steven Risser<sup>1</sup>; Megan Moore<sup>1</sup>; Mark Stasik<sup>1</sup>; Kevin Spahr<sup>1</sup>; Brian Kaseman<sup>1</sup>; <sup>1</sup>Battelle

### 3:40 PM

**Optimization of Power and Energy Densities in Supercapacitors:** *David Robinson*<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

### 4:00 PM

**Aniline Coated Carbon Cryogel with Improved Cyclic Stability for Supercapacitor Electrodes:** *Dawei Liu*<sup>1</sup>; <sup>1</sup>University of Washington

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## Failure Analysis and Prevention: Composites

*Program Organizers:* Andrew Spowage, The University of Nottingham, Malaysia Campus; Tom Ackerson, IMR Metallurgical Services; Larry Hanke, Materials Evaluation and Engineering, Inc

Wednesday PM                      Room: D235  
October 19, 2011                      Location: Columbus Con. Center

*Session Chairs:* Ronald Parrington, IMR Test Labs; Joseph Rakow, Exponent Failure Analysis Associates; William Rossey, GE Aviation

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### 2:00 PM

**Composite Failure Analysis: A Step-by-Step Overview:** *William Pinnell*<sup>1</sup>; <sup>1</sup>University Dayton Research Institute

### 2:40 PM

**An Interactive Case Study in Composite Failure Analysis:** *Joseph Rakow*<sup>1</sup>; <sup>1</sup>Exponent Failure Analysis Associates

### 3:00 PM

**Failure Analysis of Composites at the NTSB:** *Matthew Fox*<sup>1</sup>; <sup>1</sup>NTSB

### 3:20 PM Break

### 4:00 PM

**Catastrophic Failure of Fiber-Reinforced Polypropylene Lawnmower Wheels:** *Ronald Parrington*<sup>1</sup>; <sup>1</sup>IMR Test Labs

### 4:20 PM

**Stress Rupture Failure of a Continuous Fiber Composite Water Holding Tank:** *John DeFranks*<sup>1</sup>; William DeLaurier<sup>1</sup>; Ronald Parrington<sup>1</sup>; <sup>1</sup>IMR Test Labs

### 4:40 PM

**Failure of 3D Woven Composites:** *Brian Justusson*<sup>1</sup>; Mark Pankow<sup>1</sup>; Anthony Waas<sup>1</sup>; <sup>1</sup>University of Michigan

### 5:00 PM

**Fracture Study of Polymer and Polymeric Composite Materials Using the Spiral Notch Torsion Test:** *Fei Ren*<sup>1</sup>; Jy-An Wang<sup>1</sup>; Ting Tan<sup>1</sup>; Edgar Lara-Curzio<sup>1</sup>; Pancasatya Agastra<sup>2</sup>; John Mandell<sup>2</sup>; Williams Bertelsen<sup>3</sup>; Carl LaFrance<sup>4</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>Montana State University; <sup>3</sup>Gougeon Brothers, Inc. ; <sup>4</sup>Molded Fiber Glass Companies

### 5:20 PM

**Lessons Learned from Aging Studies and Teardown of Composite Structures:** *LAMIA SALAH*<sup>1</sup>; John Tomblin<sup>1</sup>; <sup>1</sup>NIAR

## Failure Analysis and Prevention: General Topics in Failure Analysis

*Program Organizers:* Andrew Spowage, The University of Nottingham, Malaysia Campus; Tom Ackerson, IMR Metallurgical Services; Larry Hanke, Materials Evaluation and Engineering, Inc

Wednesday PM  
October 19, 2011

Room: D232  
Location: Columbus Con. Center

*Session Chairs:* Brett Miller, IMR Metallurgical Services; Larry Hanke, Materials Evaluation and Engineering, Inc.; Dana Medlin, South Dakota School of Mines & Technology

### 2:00 PM

**Failure Analysis of 316L Stainless Steel J-Hooks from a Galvalume Coating Premelt Pot:** *Amber Dalley<sup>1</sup>; Erin Sapp<sup>1</sup>; <sup>1</sup>U. S. Steel Corporation*

### 2:20 PM

**Analysis of Corrosion Damage in Homes Constructed with Imported Wallboard:** *Richard Ricker<sup>1</sup>; David Pitchure<sup>1</sup>; Rik Khanna<sup>2</sup>; <sup>1</sup>NIST; <sup>2</sup>U.S. Consumer Product Safety Commission*

### 2:40 PM

**Failure Analysis of Pressure Relief Valve Spring:** *Kevin Jones<sup>1</sup>; <sup>1</sup>Packer Engineering, Inc.*

### 3:00 PM

**Crash of T-6A Texan II – Residual Strength of Rod Ends:** *Scott Schroeder<sup>1</sup>; Cyrille Moore<sup>1</sup>; Robert Carnahan<sup>1</sup>; <sup>1</sup>Exponent*

### 3:20 PM Break

### 4:00 PM Cancelled

**Failure Investigation of Leaking Lube Oil Coolers from a US Navy Littoral Combat Ship:** *Vincent Zuwala<sup>1</sup>; Eric Hakun<sup>1</sup>; <sup>1</sup>Naval Surface Warfare Center, Carderock Division*

### 4:20 PM

**Hose Coupling Cam and Pressure Relief Valve Failure:** *Mark Hood<sup>1</sup>; <sup>1</sup>McSwain Engineering, Inc.*

### 4:40 PM

**Hot Dip Galvanizing Cracking:** *Craig Clauser<sup>1</sup>; <sup>1</sup>CCECI*

### 5:00 PM

**Use of Mechanical and Metallurgical Analysis to Evaluate the Cause of Fractures in a Cast 310 Stainless Steel Pintle Chain:** *Thomas Traubert<sup>1</sup>; Tim Jur<sup>1</sup>; <sup>1</sup>Engineering Design & Testing*

### 5:20 PM Cancelled

**Failure Analysis and Corrosion Mitigation in Silage Unloader Chain Systems Used by the Agriculture Industry:** *Tom Ackerson<sup>1</sup>; <sup>1</sup>IMR Metallurgical Services*

## Fatigue and Microstructure: A Symposium on Recent Advances: Fatigue on Small Scales

*Program Organizers:* Amit Shyam, Oak Ridge National Laboratory; Sushant Jha, Air Force Research Laboratory/Universal Technology Corporation; Michael Caton, US Air Force Research Laboratory

Wednesday PM  
October 19, 2011

Room: D240/241  
Location: Columbus Con. Center

*Session Chairs:* Sushant Jha, Air Force Research Laboratory/Universal Technology Corporation; Christopher Szczepanski, Air Force Research Laboratory

### 2:00 PM

**In-Situ Microscale Fatigue Study to Evaluate the Role of Microstructural Neighborhoods:** *Christopher Szczepanski<sup>1</sup>; Sushant Jha<sup>2</sup>; Paul Shade<sup>2</sup>; Robert Wheeler<sup>3</sup>; James Larsen<sup>1</sup>; <sup>1</sup>US Air Force Research Laboratory; <sup>2</sup>Universal Technology Corporation; <sup>3</sup>UES*

### 2:40 PM

**Investigation of Very High Cycle Fatigue Behavior Using Micro-Scale Digital Image Correlation:** *Jason Geathers<sup>1</sup>; Martina Zimmermann<sup>2</sup>; Samantha Daly<sup>1</sup>; J. Wayne Jones<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>University of Siegen*

### 3:00 PM

**Characterization of Mechanical Properties at Microstructurally-Relevant Length Scales:** *Kelly Kranjc<sup>1</sup>; Nicholas Hutchinson<sup>1</sup>; Katharine Flores<sup>1</sup>; <sup>1</sup>Ohio State University*

### 3:20 PM Break

### 4:00 PM

**Suppressing Persistent Slip in Nanocrystalline Ni Alloys:** *Brad Boyce<sup>1</sup>; Henry Padilla<sup>1</sup>; Blythe Clark<sup>1</sup>; <sup>1</sup>Sandia National Labs*

### 4:40 PM

**Relating Strain Localizations to Microstructure in Fatigue Crack Growth:** *Jay Carroll<sup>1</sup>; Wael Abuzaid<sup>1</sup>; Mallory Casperson<sup>1</sup>; John Lambros<sup>1</sup>; Huseyin Sehitoglu<sup>1</sup>; Ravinder Chona<sup>2</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign; <sup>2</sup>Air Force Research Laboratory*

### 5:00 PM

**Slip Transfer at Grain Boundaries In Hastelloy-X:** *Wael Abuzaid<sup>1</sup>; Jay Carroll<sup>1</sup>; Michael Sangid<sup>1</sup>; Huseyin Sehitoglu<sup>1</sup>; John Lambros<sup>1</sup>; Ravinder Chona<sup>2</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign; <sup>2</sup>Air Force Research Lab*

### 5:20 PM

**Microstructure Evolution from the Free Surface in a Fatigue Haynes 230 Nickel Alloy:** *Buyang Cao<sup>1</sup>; Garrett Pataky<sup>1</sup>; Ian Robertson<sup>1</sup>; Huseyin Sehitoglu<sup>1</sup>; <sup>1</sup>University of Illinois Urbana Champaign*

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## Hardness across the Multi-Scales of Structure and Loading Rate: Applications I

**Program Organizers:** Ronald Armstrong, University of Maryland; David Bahr, Washington State University; Naresh Thadhani, Georgia Institute of Technology; Stephen Walley, Physics and Chemistry of Solids Cavendish Laboratory

Wednesday PM  
October 19, 2011

Room: C210  
Location: Columbus Con. Center

**Session Chairs:** Ronald Armstrong, University of Maryland; Lawrence Murr, University of Texas at El Paso

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### 2:00 PM Invited

**A Comparative Nanoindentation Study of the Metal Particles and Thin Films on a Sapphire Substrate:** *Eugen Rabkin*<sup>1</sup>; Dan Mordehai<sup>1</sup>; Michael Kazakevich<sup>1</sup>; Julia Deuschle<sup>2</sup>; David Srolovitz<sup>3</sup>; <sup>1</sup>Technion; <sup>2</sup>University of Stuttgart; <sup>3</sup>Institute of High Performance Computing, Singapore

### 2:20 PM Invited

**Hardness of 1D and 2D Nanostructured Materials Characterized by Nanoindentation:** *Han Huang*<sup>1</sup>; <sup>1</sup>The University of Queensland

### 2:40 PM Invited

**Tribology of Hardfaced Surfaces: Impact of Elastic and Plastic Indentation Work on Wear Performance:** *Ewald Badisch*<sup>1</sup>; *Markus Varga*<sup>1</sup>; Thomas Koch<sup>2</sup>; Martin Kirchgaßner<sup>3</sup>; <sup>1</sup>AC2T research GmbH; <sup>2</sup>Vienna University of Technology; <sup>3</sup>Castolin Ges.m.b.H.

### 3:00 PM Invited

**Mechanics of Material Removal in Chemical Mechanical Planarization:** *Sinan Muftu*<sup>1</sup>; <sup>1</sup>Northeastern University

### 3:20 PM Break

### 4:00 PM Invited

**Mechanical Properties of Sputtered, Highly Textured Cu/Ni Multilayers:** *Yue Liu*<sup>1</sup>; Daniel Bufford<sup>1</sup>; Haiyan Wang<sup>1</sup>; Cheng Sun<sup>1</sup>; Xinghang Zhang<sup>1</sup>; <sup>1</sup>Texas A&M University

### 4:20 PM

**Characterization of Indentation-Induced Hydrogen Cracking Using Cohesive Zone Modeling:** *Akio Yonezu*<sup>1</sup>; Takuma Hara<sup>1</sup>; Toshiyuki Kondo<sup>1</sup>; Kohji Minoshima<sup>1</sup>; <sup>1</sup>Osaka University

### 4:40 PM Invited

**Effect of an Electric Field on Solute Solubility in Al Alloys Measured by Hardness:** *Hans Conrad*<sup>1</sup>; Jun Wang<sup>1</sup>; <sup>1</sup>NC State University

### 5:00 PM

**Nanoindentation of Pure Tin: Effect of Electric Current:** *Guangfeng Zhao*<sup>1</sup>; Fuqian Yang<sup>1</sup>; <sup>1</sup>University of Kentucky

### 5:20 PM Invited

**A Mystery of Current Spike: Nanoscale Plasticity Revised:** *Roman Nowak*<sup>1</sup>; Dariusz Chrobak<sup>1</sup>; Sijo Nagao<sup>1</sup>; David Vodnick<sup>2</sup>; Michael Berg<sup>2</sup>; <sup>1</sup>Nordic Hysitron Laboratory, Aalto University; <sup>2</sup>Hysitron Inc.

### 5:40 PM

**Strain Rate Dependence of the Indentation Stress of Heat-Treated AA 6061 Alloy over the Indentation Depth Range from 50 nm to 10.0 µm:** *Meysam Haghsheenas*<sup>1</sup>; Lin Wang<sup>2</sup>; Robert Klassen<sup>1</sup>; <sup>1</sup>The University of Western Ontario; <sup>2</sup>Beijing Institute of Technology

### 6:00 PM Cancelled

**Measuring Creep Parameters Using Nanoindentation and Finite Elements:** *James Dean*<sup>1</sup>; Angela Bradbury<sup>1</sup>; Bill Clyne<sup>1</sup>; <sup>1</sup>University of Cambridge, UK

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## Innovative Processing and Synthesis of Ceramics, Glasses and Composites: Processing and Microstructure-Property Relationships

**Program Organizers:** J. P. Singh, U.S. Army Research Laboratory; Narottam Bansal, NASA Glenn Research Center; Takashi Goto, Tohoku University

Wednesday PM  
October 19, 2011

Room: C110  
Location: Columbus Con. Center

**Session Chair:** Waltraud Kriven, University of Illinois

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### 2:00 PM Invited

**Production of Spherical Ceramic Beads Using Sodium Alginate Chemistry:** *Christian Espinoza*<sup>1</sup>; Teng-Sing Wei<sup>1</sup>; *Waltraud Kriven*<sup>1</sup>; Bum Rae Cho<sup>2</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign; <sup>2</sup>Keimyung University

### 2:20 PM

**Combustion Formation of Ti<sub>2</sub>AlC MAX Phase by Electro-Plasma Processing:** *Kaiyang Wang*<sup>1</sup>; Jiandong Liang<sup>1</sup>; P.G. Zhang<sup>1</sup>; S.M. Guo<sup>1</sup>; <sup>1</sup>Louisiana State University

### 2:40 PM

**Properties of Hot-Pressed Ti<sub>3</sub>AlC<sub>2</sub> Obtained by SHS Process:** *Leszek Chlubny*<sup>1</sup>; Jerzy Lis<sup>1</sup>; <sup>1</sup>AGH-University of Science and Technology, Faculty of Materials Science and Ceramics

### 3:00 PM Cancelled

**Effect of Sintering Process and Additives on the Properties of Cordierite Based Ceramics:** *Ingunda Sperberga*<sup>1</sup>; Gaida Sedmale<sup>1</sup>; Maris Rundans<sup>1</sup>; Lauma Lindina<sup>1</sup>; Ints Steins<sup>1</sup>; <sup>1</sup>Riga Technical University

### 3:20 PM Break

### 4:00 PM

**Fabricating Complex-Shaped Ceramic Components by Injection Molding Ceramic Suspension Gels at Room Temperature:** *Valerie Wiesner*<sup>1</sup>; Rodney Trice<sup>1</sup>; Jeffrey Youngblood<sup>1</sup>; <sup>1</sup>Purdue University

### 4:20 PM

**Sintering and Characterization of Nano WC-Co Powder — On the Formation of WC Platelets:** *Yang Zhong*<sup>1</sup>; Angel Ortiz<sup>2</sup>; Leon Shaw<sup>1</sup>; <sup>1</sup>University of Connecticut; <sup>2</sup>Universidad de Extremadura

### 4:40 PM

**Low Temperature Densification and Mechanical Properties of Ultra-Hard Boron Suboxide Ceramics:** *Robert Pavlacka*<sup>1</sup>; Gary Gilde<sup>1</sup>; <sup>1</sup>U.S. Army Research Laboratory

## Integrated Computational Materials Engineering: Modeling and Simulation Applied to Metals Processing: Materials and Manufacturing Process Modeling and Simulation

Program Organizer: David Furrer, Pratt & Whitney

Wednesday PM                      Room: C213  
October 19, 2011                      Location: Columbus Con. Center

Session Chair: Pamela Kobryn, AFRL

### 2:00 PM

**Powder Metallurgy Simulations: Press-Sinter, Injection Molding:** *Randall German*<sup>1</sup>; Seokyoung Ahn<sup>2</sup>; Suk Hwan Chung<sup>3</sup>; Seong Taek Chung<sup>4</sup>; Seong Jin Park<sup>5</sup>; Young Sam Kwon<sup>4</sup>; <sup>1</sup>San Diego State University; <sup>2</sup>University of Texas Pan American; <sup>3</sup>Hyundai Steel Company; <sup>4</sup>CetaTech, Inc.; <sup>5</sup>Pohang University of Science and Technology

### 2:20 PM

**Integrated Computational Modeling of Welding – Development to Deployment:** *Sudarsanam Babu*<sup>1</sup>; <sup>1</sup>Ohio State University

### 2:40 PM

**Numerical Analysis of Welding Induced Residual Stresses Regarding Dependency of Martensite Start Temperature on Austenite Grain Size:** *Christoph Heinze*<sup>1</sup>; Christopher Schwenk<sup>1</sup>; Michael Rethmeier<sup>1</sup>; Sudarsanam Babu<sup>2</sup>; <sup>1</sup>BAM Federal Institute for Materials Research and Testing; <sup>2</sup>The Ohio State University

### 3:00 PM

**Predicting Residual Stress and Dimensional Change Due to Heat Treatment of Steel Parts:** *Blake Ferguson*<sup>1</sup>; Zhichao Li<sup>1</sup>; Andrew Freborg<sup>1</sup>; <sup>1</sup>Deformation Control Technology, Inc.

### 3:20 PM Break

### 4:00 PM

**Simulation of Rotational Welding Operations:** *Michael Preuss*<sup>1</sup>; Philip Withers<sup>1</sup>; <sup>1</sup>University of Manchester

### 4:20 PM

**Computer Modeling of Induction Heat Treating: Things to be Aware Of, Things to Avoid:** *Valery Rudnev*<sup>1</sup>; <sup>1</sup>Inductoheat Inc.

### 4:40 PM

**Modeling and Simulation of Machining:** *Christian Fischer*<sup>1</sup>; <sup>1</sup>Scientific Forming Technologies Corporation

### 5:00 PM

**Stress-Relief Simulation:** *Dennis Buchanan*<sup>1</sup>; <sup>1</sup>UDRI

## Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches -- Fundamental and Engineering Issues: Interfaces, 3-Lines and Wetting

Program Organizers: Wayne Kaplan, Technion - Israel Institute of Technology; Paul Wynblatt, Carnegie Mellon University; Dominique Chatain, Centre Interdisciplinaire de Nanoscience de Marseille; Mikel Holcomb, West Virginia University

Wednesday PM                      Room: C120  
October 19, 2011                      Location: Columbus Con. Center

Session Chairs: Eduardo Saiz, Imperial College; Paul Wynblatt, Carnegie Mellon University

### 2:00 PM Keynote

**Phase Transformations in Nanoscale Si/Au and Ge/Au Systems:** *Frances Ross*<sup>1</sup>; <sup>1</sup>IBM T. J. Watson Research Center

### 2:40 PM Invited

**Experimental methodologies for assessing the surface energy of highly hygroscopic materials: The case of nanocrystalline magnesia:** *Ricardo H. R. Castro*<sup>1</sup>; Klaus van Benthem<sup>1</sup>; Tien Tran<sup>1</sup>; Alexandra Navrotsky<sup>1</sup>; Shmuel Hayun<sup>1</sup>; <sup>1</sup>University of California at Davis

### 3:00 PM Invited

**Structure and Energy of Equilibrated Ni-Al<sub>2</sub>O<sub>3</sub> and Ni-ZrO<sub>2</sub> Interfaces:** *Hila Meltzman*<sup>1</sup>; Wayne Kaplan<sup>1</sup>; <sup>1</sup>Technion - Israel Institute of Technology

### 3:20 PM Break

### 4:00 PM Invited

**Grain Boundary and Orientation Effects on the Growth of Tin Whiskers:** *Aaron Pedigo*<sup>1</sup>; Pylin Sarobol<sup>1</sup>; Carol Handwerker<sup>1</sup>; *John Blendell*<sup>1</sup>; <sup>1</sup>Purdue University

### 4:20 PM Invited

**In Situ TEM Investigations of Wetting-Dewetting Transitions of Ultra-Thin Nickel Films on (100) Silicon Substrates:** *Andrew Thron*<sup>1</sup>; *Klaus van Benthem*<sup>1</sup>; <sup>1</sup>University of California, Davis

### 4:40 PM

**Interfacial Free Energies from Data on Coarsening Plus Assessments of Gibbs Free Energies of Mixing in Ni-Base  $\gamma/\gamma'$  Alloys:** *Alan Ardell*<sup>1</sup>; <sup>1</sup>National Science Foundation

### 5:00 PM

**Surface Tension of Cerium Using the Electrostatic Levitation Process – The Effect of Oxygen:** *Erik Lord*<sup>1</sup>; David Olson<sup>1</sup>; Stephen Liu<sup>1</sup>; <sup>1</sup>Colorado School of Mines

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## International Symposium on Advances in Nanostructured Materials and Applications: The 2011 Acta Materialia Gold Medal Symposium: Nanoceramics II: Nanomaterials and Their Applications

*Program Organizers:* Haiyan Wang, Texas A&M University; Nuggehalli Ravindra, New Jersey Institute of Technology; Alan Ardell, National Science Foundation; Yuntian Zhu, North Carolina State University; Xinghang Zhang, Texas A&M University; Rajiv K. Singh, University of Florida; John Prater, Army Research Office

Wednesday PM  
October 19, 2011

Room: E170  
Location: Columbus Con. Center

*Session Chairs:* John Prater, Army Research Office; Marc Meyers, University of California, San Diego

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### 2:00 PM Invited

**Synchrotron X-Ray Laue Microbeam Studies of Individual Nanostructures:** *John Budai*<sup>1</sup>; Jonathan Tischler<sup>1</sup>; Zhengwei Pan<sup>2</sup>; Alexander Tselev<sup>1</sup>; Andrei Kolmakov<sup>3</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>University of Georgia; <sup>3</sup>Southern Illinois University

### 2:20 PM Invited

**Critical Challenges in GaN-Based Structures on Silicon for High Power Devices:** *C.L. Reynolds*<sup>1</sup>; J. Narayan<sup>1</sup>; <sup>1</sup>North Carolina State University

### 2:40 PM Invited

**Fundamental Problems of Nano Self-Assembly for Manufacturing Semiconductor Products:** *Rajendra Singh*<sup>1</sup>; Githin Alapatt<sup>1</sup>; Nishant Gupta<sup>1</sup>; Kelvin Poole<sup>1</sup>; <sup>1</sup>Clemson University

### 3:00 PM Invited

**Pulsed Laser Induced Self-Organization of Bilayer Liquids to Nanomanufacture Plasmonic-Ferromagnetic Nanocomposites:** *Ramki Kalyanaraman*<sup>1</sup>; <sup>1</sup>University of Tennessee

### 3:20 PM Invited

**Nanowire Based Photodetectors:** *Narsingh Singh*<sup>1</sup>; M King<sup>1</sup>; S McLaughlin<sup>1</sup>; D Kahler<sup>1</sup>; A Berghmans<sup>1</sup>; B Wagner<sup>1</sup>; D Knuteson<sup>1</sup>; M Aziz<sup>1</sup>; <sup>1</sup>Northrop Grumman Corporation

### 3:40 PM Break

### 4:20 PM Invited

**The Role of the Nanoscale in the Success of Large-Scale High Temperature Superconductors:** *Justin Schwartz*<sup>1</sup>; <sup>1</sup>North Carolina State University

### 4:40 PM Invited

**Nano Brushes of Polysaccharides: Materials, Mechanisms and Applications:** *Ram Singh*<sup>1</sup>; <sup>1</sup>IISER PUNE, INDIA

### 5:00 PM Invited

**Structural Nanoceramics and Nanocomposites: Challenges and Opportunities:** *Nitin Padture*<sup>1</sup>; <sup>1</sup>The Ohio State University

### 5:20 PM

**Magnetron Sputtered Multi-layered Alumina and Zirconia Thin Films for Thermal Barrier Coating Applications:** *shengmin guo*<sup>1</sup>; Diane Ho<sup>1</sup>; Ranran Liu<sup>1</sup>; <sup>1</sup>Louisiana State University

### 5:40 PM

**Ag Nano Plate for Application of Printable Electronics:** *Young Jin Kim*<sup>1</sup>; <sup>1</sup>Tokusen USA Inc.

### 6:00 PM

**Unusual Variation in Optical Properties of Undoped Zinc Oxide Nanoparticles:** *Navendu Goswami*<sup>1</sup>; <sup>1</sup>Jaypee Institute of Information Technology

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## International Symposium on Defects, Transport and Related Phenomena: Defects and Transport in Materials Related to Fuel Cells I

*Program Organizers:* Sangtae Kim, University of California, Davis; Ruediger Dieckmann, Cornell University; Doreen Edwards, Alfred University; Manfred Martin, RWTH Aachen University; Thomas Mason, Northwestern University

Wednesday PM  
October 19, 2011

Room: C122  
Location: Columbus Con. Center

*Funding support provided by:* WCU Hybrid Materials Program, Department of Materials Science and Engineering, Seoul National University, Korea

*Session Chairs:* Manfred Martin, RWTH Aachen University ; Alastair Cormack , Alfred University

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### 2:00 PM Invited

**Defect Characteristics of Solid Oxide Fuel Cell Materials Containing Tetrahedral Moieties:** *Peter Slater*<sup>1</sup>; <sup>1</sup>University of Birmingham

### 2:40 PM Invited

**Structure and Defects in Ceria Nanoparticles:** *Alastair Cormack*<sup>1</sup>; Bu Wang<sup>1</sup>; Samuel Lamphier<sup>1</sup>; <sup>1</sup>Alfred University

### 3:20 PM Break

### 4:00 PM

**Local and Average Structure of Lanthanum Tungstate: A Proton Conductor with Fluorite-Type Structure:** *Anna Magraso*<sup>1</sup>; Carlos Frontera<sup>2</sup>; Jesus Canales-Vazquez<sup>3</sup>; Jonathan Polfus<sup>1</sup>; Reidar Haugsrud<sup>1</sup>; <sup>1</sup>Dept. Chemistry, University of Oslo; <sup>2</sup>ICMAB-CSIC; <sup>3</sup>Renewable Energy Research Institute, University of Castilla-la Mancha

### 4:20 PM Invited

**Mixed Oxide Ion and Electron Conduction in Reduced Ceria by Density Functional Study:** *NAKAYAMA MASANOBU*<sup>1</sup>; HIROMI OSHIMA<sup>1</sup>; MANFRED MARTIN<sup>2</sup>; <sup>1</sup>Nagoya Institute of Technology; <sup>2</sup>RWTH Aachen University

### 5:00 PM

**Oxygen Transport Investigation on Infiltrated SOFC Cathode:** *Yihong Li*<sup>1</sup>; Kirk Gerdes<sup>2</sup>; Xingbo Liu<sup>1</sup>; <sup>1</sup>West Virginia University; <sup>2</sup>1. National Energy Technology Laboratory

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## Joining and Sustaining of Superalloys: Joining and Sustaining of Ni-Base Superalloys: Part II

*Program Organizers:* Sammy Tin, Illinois Institute of Technology; Jeffrey Evans, University of Alabama in Huntsville; David Mourer, GE Aviation; Judith Schneider, Mississippi State University; Ji-Cheng Zhao, The Ohio State University

Wednesday PM  
October 19, 2011

Room: E161A  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

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### 2:00 PM Invited

**Laser Repair and Cladding of Superalloy Single Crystals:** *Wilfried Kurz*<sup>1</sup>; <sup>1</sup>EPFL, Swiss Federal Institute of Technology Lausanne

### 2:20 PM Invited

**Superalloy Component Repair by LENS Material Build-Up:** *Richard Grylls*<sup>1</sup>; David Keicher<sup>1</sup>; <sup>1</sup>Optomec Inc.



2:40 PM

**Weld Mechanical Properties of a Ni-Base Superalloy in Various Pre-Weld Aged Conditions:** *Jeremy Caron*<sup>1</sup>; Greg Hoback<sup>1</sup>; Mark Britton<sup>1</sup>; Lee Pike<sup>1</sup>; <sup>1</sup>Haynes International, Inc.

3:00 PM

**Effect of Ta/Nb Ratio on the Solidification Behavior and Phase Equilibria of Polycrystalline Gamma/Gamma Prime-Delta Eutectic Ni-Base Superalloy:** *Mengtao Xie*<sup>1</sup>; Randy Helmink<sup>2</sup>; Sammy Tin<sup>1</sup>; <sup>1</sup>Illinois Institute of Technology; <sup>2</sup>Rolls-Royce Corporation

3:20 PM

**Continuous Heating and Cooling Transformation Diagram in Ni-Base Superalloy 282:** *Boian Alexandrov*<sup>1</sup>; Jeffrey Rodelas<sup>1</sup>; Margaret Kittila<sup>1</sup>; John Lippold<sup>1</sup>; David Metzler<sup>2</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Haynes International

3:40 PM Break

4:00 PM Invited

**Understanding the Effect of Microstructure on Deformation Behavior of Ni-Base Disk Superalloys: Characterization, Phase Field Modeling and Crystal Plasticity Modeling:** *Michael Mills*<sup>1</sup>; Hallee Deutchman<sup>1</sup>; Patrick Phillips<sup>1</sup>; Ning Zhou<sup>1</sup>; Mahendra Samal<sup>1</sup>; Yunzhi Wang<sup>1</sup>; Somnath Ghosh<sup>1</sup>; Andrew Wessman<sup>2</sup>; David Mourer<sup>2</sup>; Ken Bain<sup>2</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>GE Aviation

4:20 PM Invited

**Oxidation Influence on Creep Performance of Thin-Walled Structures:** *Uwe Glatzel*<sup>1</sup>; Matthias Bensch<sup>1</sup>; Martin Brunner<sup>1</sup>; Ernst Affeldt<sup>1</sup>; Rainer Völkl<sup>1</sup>; <sup>1</sup>University Bayreuth

4:40 PM

**The Chemistry and Mechanical Properties of Hiped Dual Alloy Compacts:** Shaun Holmes<sup>1</sup>; *Mark Hardy*<sup>1</sup>; Catherine Rae<sup>2</sup>; <sup>1</sup>Rolls-Royce plc; <sup>2</sup>University of Cambridge

5:00 PM

**Effects of Alloying Elements on Shear Deformation and Stacking Fault of FCC Ni: A First-Principles Study:** *Shun-Li Shang*<sup>1</sup>; Yi Wang<sup>1</sup>; Zi-Kui Liu<sup>1</sup>; <sup>1</sup>Pennsylvania State University

5:20 PM

**Effect of HIP Temperature on Mechanical Properties and Microstructure of GTD-111 Superalloy:** *Seyed Mohsen Sadat Shekarab*<sup>1</sup>; <sup>1</sup>K. N. Toosi University

5:40 PM Cancelled

**Evaluation of Residual, Post-Service Creep-Rupture Properties of S-816 Buckets:** *Jonathan Contreras*<sup>1</sup>; <sup>1</sup>The University of Texas at El Paso

## Joining of Advanced and Specialty Materials (JASM XIII): Micro and Nano Joining II

**Program Organizers:** Judith Schneider, Mississippi State University; Norman Zhou, Univ. of Waterloo; Leijun Li, Utah State University; Mathieu Brochu, McGill University; Boian Alexandrov, The Ohio State University; Michael Halbig, U.S. Army Research Laboratory; Akio Hirose, Osaka University; Sammy Tin, Illinois Institute of Technology

Wednesday PM  
October 19, 2011

Room: E161B  
Location: Columbus Con. Center

**Session Chairs:** Mathieu Brochu, McGill University; Norman Zhou, University of Waterloo; Akio Hirose, Osaka University

2:00 PM Invited

**Evaluation of Dissimilar Metal Electro-Spark Deposits:** *Michael Eff*<sup>1</sup>; Jerry Gould<sup>1</sup>; <sup>1</sup>Edison Welding Institute

2:20 PM Invited

**Characterization of Electro-Spark Deposition of ER312 on 304L:** *Thomas Lienert*<sup>1</sup>; Dennis Lujan<sup>1</sup>; Kendall Hollis<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

2:40 PM

**Solidification Structure Resulting of Electrospark Deposition of Multiphase Materials:** *Rabab Farhat*<sup>1</sup>; *Mathieu Brochu*<sup>1</sup>; <sup>1</sup>McGill University

3:00 PM

**Rapid Solidification of Al-Rich Aluminum-Titanium Alloys Using Electrospark Deposition Process:** *Gilberto Portillo*<sup>1</sup>; Mathieu Brochu<sup>1</sup>; <sup>1</sup>McGill University - Mining & Materials Engineering

3:20 PM Break

4:00 PM

**Laser Microwelding of Shape Memory Alloys:** *Rosa Miranda*<sup>1</sup>; <sup>1</sup>FCT-UNL

4:20 PM

**Fabrication of Intermetallics Micro Networks on Light Metals for Surface Stress Modifications through Reaction Diffusion Joining:** *Yasunori Uehara*<sup>1</sup>; Soshu Kiriha<sup>2</sup>; Satoko Tasaki<sup>2</sup>; <sup>1</sup>Graduate School of Engineering, Osaka University; <sup>2</sup>Joining and Welding Research Institute, Osaka University

## Materials for Nuclear Waste Disposal and Environmental Cleanup: Processing and Characterization of Salts for Nuclear Waste Disposal Program Organizer: Elizabeth Hoffman, Savannah River National Laboratory

Wednesday PM  
October 19, 2011

Room: C226  
Location: Columbus Con. Center

**Session Chair:** Alex Cozzi, Savannah River National Laboratory

4:00 PM

**Immobilisation of Pyroprocessing Waste Salts:** *Eric Vance*<sup>1</sup>; Joel Davis<sup>1</sup>; Kylie Olufson<sup>1</sup>; Ilkay Chironi<sup>1</sup>; <sup>1</sup>ANSTO Materials

4:20 PM

**Low-Melting Salt Mixtures Composition Determination for Nuclear Waste Processing:** *Vasily Lutsyk*<sup>1</sup>; Alexandr Zyryanov<sup>2</sup>; <sup>1</sup>Russian Academy of Sciences (Siberian Division); <sup>2</sup>Buryat State University

4:40 PM

**Rare Earth and Plutonium Doping of Apatite:** *Eric Vance*<sup>1</sup>; Yingjie Zhang<sup>1</sup>; Terry McLeod<sup>1</sup>; Ian Farnan<sup>2</sup>; Prashant Selvaratnam<sup>2</sup>; Miodrag Jovanovic<sup>1</sup>; <sup>1</sup>ANSTO Materials; <sup>2</sup>University of Cambridge

5:00 PM

**Evaluation of Mixing Occurring in the SRS Saltstone Transfer Line:** *Alex Cozzi*<sup>1</sup>; Erich Hansen<sup>1</sup>; Tim Jones<sup>1</sup>; Tim Jones<sup>1</sup>; Marissa Reigel<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

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## Materials for Nuclear Waste Disposal and Environmental Cleanup: Waste Forms for Nuclear Disposition

*Program Organizer:* Elizabeth Hoffman, Savannah River National Laboratory

Wednesday PM                      Room: C226  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* Elizabeth Hoffman, Savannah River National Laboratory

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**2:00 PM Panel Discussion**

**3:20 PM Break**

**3:00 PM Question and Answer Period**

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## Materials Science Challenges for Nuclear Applications: Materials Degradation I

*Program Organizers:* Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprashad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Wednesday PM                      Room: C225  
October 19, 2011                      Location: Columbus Con. Center

*Session Chairs:* Raul Rebak, GE Global Research; Kumar Sridharan, University of Wisconsin

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**2:00 PM Invited Cancelled**

**Materials Degradation Issues in Pressurized Water Reactors:** *Denise Paraventi*<sup>1</sup>; <sup>1</sup>BMPC - Bettis Laboratory

**2:40 PM**

**Environmentally Assisted Cracking Resistance of Ferritic Chromium Steels in High Temperature Water:** Peter Andresen<sup>1</sup>; Timothy Jurewicz<sup>1</sup>; Raul Rebak<sup>1</sup>; <sup>1</sup>GE Global Research

**3:00 PM**

**Creep Crack Initiation and Crack Growth of Alloy 617 in Impure VHTR Helium and Air at Elevated Temperatures:** Guoping Cao<sup>1</sup>; Paul Pezzi<sup>1</sup>; Graham Fischer<sup>1</sup>; Kumar Sridharan<sup>1</sup>; Todd Allen<sup>1</sup>; Wendy Crone<sup>1</sup>; <sup>1</sup>University of Wisconsin

**3:20 PM Break**

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## Materials Science Challenges for Nuclear Applications: Materials Degradation II

*Program Organizers:* Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprashad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Wednesday PM                      Room: C225  
October 19, 2011                      Location: Columbus Con. Center

*Session Chairs:* Raul Rebak, GE Global Research; Denise Paraventi, BMPC - Bettis Laboratory

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**4:00 PM Invited**

**Development of Materials for High Dose Reactor Applications:** *Stuart Maloy*<sup>1</sup>; Mychailo Toloczko<sup>2</sup>; Osman Anderoglu<sup>1</sup>; Dave Hoelzer<sup>3</sup>; Thak-Sang Byun<sup>3</sup>; James Cole<sup>4</sup>; Tarik Saleh<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory; <sup>2</sup>PNNL; <sup>3</sup>ORNL; <sup>4</sup>Idaho National Laboratory

**4:20 PM**

**Spectral Emissivity Measurements of High Temperature Reactor Materials: Role of Oxidation and Surface Treatments:** *Kumar Sridharan*<sup>1</sup>; Scott Weber<sup>1</sup>; Guoping Cao<sup>1</sup>; David Adam<sup>1</sup>; Michael Adashek<sup>1</sup>; Mark Anderson<sup>1</sup>; Todd Allen<sup>1</sup>; <sup>1</sup>University of Wisconsin

**4:40 PM**

**Stress Corrosion Cracking Initiation of Austenitic Alloys in Supercritical Water:** *Guoping Cao*<sup>1</sup>; Vahid Firouzdoor<sup>1</sup>; Todd Allen<sup>1</sup>; <sup>1</sup>University of Wisconsin

**5:00 PM**

**A Creep/Fatigue Testing System for Alloys in Impure Helium Environments:** *Alfred Okello*<sup>1</sup>; Gokce Gulsoy<sup>1</sup>; Chris Torbet<sup>2</sup>; Gary Was<sup>1</sup>; Wayne Jones<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>University of California Santa Barbara

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## Measurements and Modeling of Advanced Automotive and Structural Materials at Intermediate and High Strain Rates: Intermediate-to-High-Rate Material Behavior

*Program Organizer:* Steven P. Mates, National Institute of Standards and Technology

Wednesday PM                      Room: D231  
October 19, 2011                      Location: Columbus Con. Center

*Session Chair:* Steven Mates, NIST

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**2:00 PM Keynote**

**High-Strain-Rate & Shock Response of Lightweight Materials: How Dynamic Properties Influence the Future Design Landscape for Transportation Applications:** *George Gray*<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

**2:40 PM**

**Dynamic Response of Magnesium Alloy AZ31B and Aluminum Alloys 7039, 6061, 5083 and 5059:** *Sara Perez-Bergquist*<sup>1</sup>; George Gray III<sup>1</sup>; Carl Trujillo<sup>1</sup>; Ellen Cerreta<sup>1</sup>; Mike Lopez<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

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3:00 PM

**Dynamic Tensile Behavior of a TRIP Steel:** Oscar Guzman<sup>1</sup>; Weinong Chen<sup>2</sup>; <sup>1</sup>NASA; <sup>2</sup>Purdue University

3:20 PM Break

4:00 PM

**Nonlinear Stress Wave Mitigation in Ordered Granular Media:** Tommy On<sup>1</sup>; Erheng Wang<sup>1</sup>; John Lambros<sup>1</sup>; <sup>1</sup>University of Illinois at Urbana Champaign

4:20 PM

**Strain Rate Effect on Interlaminar Fracture of A Woven Glass Composite:** Bo Song<sup>1</sup>; Wei-Yang Lu<sup>1</sup>; Helena Jin<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

4:40 PM

**Investigation of Damage Mechanisms for Polymers Tested under High Strain Rate Conditions:** David Francis<sup>1</sup>; Mark Horstemeyer<sup>1</sup>; Jean-Luc Bouvard<sup>1</sup>; <sup>1</sup>Mississippi State University

5:00 PM

**Adiabatic Shear Sensitivities of TC18 Titanium Alloy Characterized with Forced Shearing Test:** Lin Wang<sup>1</sup>; Pu Miao<sup>1</sup>; Xing Cheng<sup>1</sup>; Kun Sun<sup>2</sup>; Shu Li<sup>1</sup>; <sup>1</sup>Beijing Institute of Technology; <sup>2</sup>Chuxiong Normal University

## Microwave Processing of Materials: Session I

*Program Organizers:* Morsi Mahmoud, Karlsruhe Institute of Technology (KIT); Guido Link, Karlsruhe Institute of Technology

Wednesday PM  
October 19, 2011

Room: C221  
Location: Columbus Con. Center

*Session Chair:* Morsi Mahmoud, Karlsruhe Institute of Technology

2:00 PM Invited

**The MW Technology and Activities in Japan:** Motoyasu Sato<sup>1</sup>; Kazuhiro Nagata<sup>2</sup>; Naoki Shinohara<sup>3</sup>; <sup>1</sup>National Institute of Fusion Science (NIFS); <sup>2</sup>Tokyo University of the Arts; <sup>3</sup>Kyoto University

2:20 PM

**Millimeter-Wave Sintering with Application of External Pressure:** Yury Bykov<sup>1</sup>; Sergey Egorov<sup>1</sup>; Anatoly Eremeev<sup>1</sup>; Vladislav Kholoptsev<sup>1</sup>; Kirill Rybakov<sup>1</sup>; Vladimir Semenov<sup>1</sup>; <sup>1</sup>Institute of Applied Physics, Russian Academy of Sciences

2:40 PM

**Effect of Microwave Plasma Process Conditions on Nanocrystalline Diamond Deposition on AlGaIn/GaN HEMT and Si Device Metallizations:** Nirmal Govindaraju<sup>1</sup>; Raj Singh<sup>1</sup>; <sup>1</sup>University of Cincinnati

3:00 PM

**Understanding the Effect of Microwave Treatment on the Processing of Mineral Ores:** Abubeker Ali<sup>1</sup>; Steven Bradshaw<sup>1</sup>; <sup>1</sup>Stellenbosch University

3:20 PM Break

4:00 PM

**Investigation on Microstructural Characterization of Microwave Cladding:** Dheeraj Gupta<sup>1</sup>; Apurbba Kumar Sharma<sup>1</sup>; <sup>1</sup>Indian Institute of Technology Roorkee

4:20 PM

**A Contactless Method to Monitor Shrinkage and Temperature Distribution during Microwave Sintering:** Dominique GOEURLOT<sup>1</sup>; Daniel ZYMEKA<sup>1</sup>; Sébastien SAUNIER<sup>1</sup>; Jérôme MOLIMARD<sup>1</sup>; <sup>1</sup>ENS Mines de Saint-Etienne

4:40 PM

**Microwave Sintering of Complex-Shape Titanium Powder Compacts:** Arne Fliflet<sup>1</sup>; Ashraf Imam<sup>1</sup>; Ralph Bruce<sup>2</sup>; Jerry Feng<sup>1</sup>; Richard Everett<sup>1</sup>; <sup>1</sup>Naval Research Laboratory; <sup>2</sup>Bethel College

5:00 PM

**Dilatometric Study and In-Situ Resistivity Measurements during Millimeter Wave Sintering of Metal Powder Compacts:** Guido Link<sup>1</sup>; Morsi Mahmoud<sup>1</sup>; Manfred Thumm<sup>1</sup>; <sup>1</sup>Karlsruhe Institute of Technology

5:20 PM Concluding Comments

## Multifunctional Oxides: Session V

*Program Organizer:* Xiaoqing Pan, University of Michigan

Wednesday PM  
October 19, 2011

Room: E162A  
Location: Columbus Con. Center

*Session Chairs:* Cewen Nan, Tsinghua University; Sophie Harrington, University of Cambridge

2:00 PM Invited

**Multi-Scale Modeling of the Converse Magnetoelectric Effect in Ferromagnetic/Ferroelectric Layered Heterostructures:** Jia-Mian Hu<sup>1</sup>; Guang Sheng<sup>2</sup>; Jingxian Zhang<sup>2</sup>; Long-Qing Chen<sup>2</sup>; CW Nan<sup>1</sup>; <sup>1</sup>Tsinghua University; <sup>2</sup>Pennsylvania State University

2:40 PM Invited

**Self-Assembled Oxide Nano-Scaffolds for Enhanced Ferroelectricity in Thick Barium Titanate Films:** Sophie Harrington<sup>1</sup>; Judith MacManus-Driscoll<sup>1</sup>; <sup>1</sup>University of Cambridge

3:20 PM Break

4:00 PM

**First Principles Study of Disorder in Double Perovskites: A Tale of Two Compounds:** Rohan Mishra<sup>1</sup>; Oscar Restrepo<sup>1</sup>; Patrick Woodward<sup>1</sup>; Wolfgang Windl<sup>1</sup>; <sup>1</sup>The Ohio State University

4:20 PM

**Study of Defects in Sputter Deposited Thin Films of Double Perovskites Sr<sub>2</sub>FeMoO<sub>6</sub> and Sr<sub>2</sub>CrReO<sub>6</sub>:** Manisha Dixit<sup>1</sup>; Robert Williams<sup>1</sup>; Srinivasan Rajagopalan<sup>2</sup>; Adam Hauser<sup>1</sup>; Fengyuan Yang<sup>1</sup>; Hamish Fraser<sup>1</sup>; Wolfgang Windl<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Exxon Mobil Research and Engineering Company

4:40 PM Invited

**Novel Low Moment Magnetic Films for Multiferroic Heterostructures with Strong Magneto Electric Coupling:** Jing Lou<sup>1</sup>; Ziyao Zhou<sup>1</sup>; Shawn Beguhn<sup>1</sup>; Scott Rand<sup>1</sup>; Xi Yang<sup>1</sup>; Ming Liu<sup>1</sup>; Nian Sun<sup>1</sup>; <sup>1</sup>Northeastern University

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## Nanotechnology for Energy, Healthcare and Industry : Session II

**Program Organizers:** Gary Pickrell, Virginia Tech; Suveen Mathaudhu, U.S. Army Research Office; Wolfgang Sigmund, University of Florida; Jud Ready, Georgia Tech; George Wei, Osram Sylvania; Ke Wang, Virginia Tech; Zhiwei Shan, Jiaotong University; Alpesh Shukla, Lawrence Berkeley National Laboratory; Nitin Chopra, The University of Alabama; Sudipta Seal, Univ of Central Florida; Navin Manjooan, Siemens Corporation; Julia Greer, California Institute of Technology

Wednesday PM  
October 19, 2011

Room: C125  
Location: Columbus Con. Center

*Session Chairs:* Navin Manjooan, Siemens Corporate Technology; Nitin Chopra, The University of Alabama Tuscaloosa

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### 2:00 PM

**Multi-Functional Nanoscale Heterostructures Derived from 1-D Nanostructures:** *Nitin Chopra*<sup>1</sup>; <sup>1</sup>The University of Alabama

### 2:40 PM

**Controlling Electron Transport in CNT-Supported Organometallic Catalysts:** *Yuan Lu*<sup>1</sup>; Bruce Hinds<sup>1</sup>; Matthew Beck<sup>1</sup>; <sup>1</sup>University of Kentucky

### 3:00 PM

**Anodization of Aluminum-Titanium Alloys for Solar Cell Applications:** *Neslihan Alpay*<sup>1</sup>; George Demopoulos<sup>1</sup>; Mathieu Brochu<sup>1</sup>; <sup>1</sup>McGill University

### 3:20 PM Break

### 4:00 PM

**Highly Active Porous Catalysts Fabricated by Attachment of Metal Nanoparticles on Hierarchical Carbon Structures:** *Hema Vijwani*<sup>1</sup>; *Sharmila Mukhopadhyay*<sup>1</sup>; <sup>1</sup>Wright State University

### 4:20 PM

**Fabrication of P-Type Silicon Optical Fiber:** *Brian Scott*<sup>1</sup>; Ke Wang<sup>1</sup>; Gary Pickrell<sup>1</sup>; <sup>1</sup>Virginia Tech

### 4:40 PM

**Nanoscale Carbon in Metals for Energy Applications:** *David Forrest*<sup>1</sup>; Lourdes Salamanca-Riba<sup>2</sup>; Lloyd Brown<sup>3</sup>; Jennifer Wolk<sup>1</sup>; Peter Joyce<sup>3</sup>; X. Jie Zhang<sup>1</sup>; <sup>1</sup>Naval Surface Warfare Center; <sup>2</sup>University of Maryland; <sup>3</sup>United States Naval Academy

### 5:00 PM

**Novel Catalytic Behavior of Ultra-Small Ceria Nanoparticles for Water Splitting through DFT Investigation:** *Xing Huang*<sup>1</sup>; Matthew Beck<sup>1</sup>; <sup>1</sup>University of Kentucky

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## Next Generation Biomaterials: Next Generation Biomaterials

**Program Organizers:** Roger Narayan, Univ of North Carolina & North Carolina State Univ; Kalpana Katti, North Dakota State University; Kajal Mallick, University of Warwick; Vilupanur Ravi, California State Polytechnic University, Pomona; Varshni Singh, Louisiana State University

Wednesday PM  
October 19, 2011

Room: C215  
Location: Columbus Con. Center

*Session Chairs:* Sarit Bhaduri, The University of Toledo ; Eldon Case, Michigan State Univ

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### 2:00 PM Invited

**Porosity Dependent Strength and Elastic Modulus of Hydroxyapatite and Other Oxide and Non-Oxide Materials:** *Eldon Case*<sup>1</sup>; Xiaofeng Fan<sup>1</sup>; Fei Ren<sup>2</sup>; Melissa Baumann<sup>1</sup>; Y Shu<sup>1</sup>; <sup>1</sup>Michigan State Univ; <sup>2</sup>Oak Ridge National Laboratory

### 2:20 PM

**Synthesis and Properties of Nano-Calcium Phosphates for Biomedical Applications:** *Darcy Wagner*<sup>1</sup>; Huan Zhou<sup>1</sup>; Joseph Lawrence<sup>1</sup>; Sarit Bhaduri<sup>1</sup>; <sup>1</sup>University of toledo

### 2:40 PM

**Processing Effects on the Crystallinity, Microstructure, and Mechanical Properties of Hydroxyapatite Reinforced Polyetheretherketone Scaffolds:** *Timothy Conrad*<sup>1</sup>; David Jaekel<sup>2</sup>; Steven Kurtz<sup>2</sup>; Ryan Roeder<sup>1</sup>; <sup>1</sup>University of Notre Dame; <sup>2</sup>Drexel University

### 3:00 PM

**Preparing PLA Powders for Powder-Based Processing Using a Solvent-Non-Solvent Mediated Technique:** *Huan Zhou*<sup>1</sup>; Sarit Bhaduri<sup>1</sup>; <sup>1</sup>University of toledo

### 3:20 PM Break

### 4:00 PM Invited

**Biological Aspects of Chemically Bonded Ca-Aluminate Based Biomaterials:** *Leif Hermansson*<sup>1</sup>; <sup>1</sup>Doxa AB

### 4:20 PM

**Enhancement of Apatite Formation by Oxynitridation of Ti Substrate:** *Masami Hashimoto*<sup>1</sup>; Kazumi Kashiwagi<sup>1</sup>; Satoshi Kitaoka<sup>1</sup>; <sup>1</sup>Japan Fine Ceramics Center

### 4:40 PM

**Corrosion Behaviour of Ti-Base Alloys in Biocompatible Solutions:** *Sailendra Paul*<sup>1</sup>; Smita Sahu<sup>2</sup>; Manish Roy<sup>3</sup>; <sup>1</sup>VNIT; <sup>2</sup>IIT; <sup>3</sup>DMRL

### 5:00 PM

**Electrochemical Characterization of the Eastern Oyster Crassostrea Virginica Shell as a Bioceramic Material:** *Yuhchae Yoon*<sup>1</sup>; Douglas Hansen<sup>1</sup>; Karolyn Hansen<sup>2</sup>; Andrew Mount<sup>3</sup>; <sup>1</sup>University of Dayton Research Institute; <sup>2</sup>University of Dayton; <sup>3</sup>Clemson University

## Novel Sintering Processes and News in Traditional Sintering and Grain Growth: Field Assisted and NanoSintering IV

*Program Organizers:* Ricardo H. R. Castro, University of California at Davis; Douglas Gouvêa, Universidade de São Paulo

Wednesday PM  
October 19, 2011

Room: C222  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

### 2:00 PM

**Synthesis and Microstructure of Bulk Nanostructured Cu by Spark Plasma Sintering of Cryomilled Powders:** *Haiming Wen<sup>1</sup>; Yonghao Zhao<sup>1</sup>; Zhihui Zhang<sup>1</sup>; Osman Ertorer<sup>1</sup>; Shaoming Dong<sup>2</sup>; Enrique Lavernia<sup>1</sup>*; <sup>1</sup>University of California, Davis; <sup>2</sup>Shanghai Institute of Ceramics, Chinese Academy of Sciences

### 2:20 PM

**Deformation-Induced Ductility in Cryomilled Nanostructured Nickel with Porosity and Grain Boundary Segregation:** *Yonghao Zhao<sup>1</sup>; Q. Zhan<sup>2</sup>; T.D. Topping<sup>1</sup>; Y. Li<sup>1</sup>; E.J. Lavernia<sup>1</sup>*; <sup>1</sup>University of California Davis; <sup>2</sup>University of Science and Technology Beijing, China

### 2:40 PM

**Compaction and Sintering of Mechanically Alloyed W-3Ni-1Fe Powder:** *Alex Aning<sup>1</sup>; Matthew Hiser<sup>1</sup>*; <sup>1</sup>Virginia Tech

### 3:00 PM Break

### 3:40 PM

**On the Conditions of Forming WC Platelets in WC-Co Hardmetals:** *Yang Zhong<sup>1</sup>; Leon Shaw<sup>1</sup>*; <sup>1</sup>University of Connecticut

### 4:00 PM

**Effect of Ni Content on the Sintering of Mechanically Alloyed W-Ni Alloys:** *Andrew Zeagler<sup>1</sup>; Alex Aning<sup>1</sup>*; <sup>1</sup>Virginia Tech

### 4:20 PM

**Effect of Coke Particle Size on Sinter Quality:** *Nader Tahanpesarandezfuly<sup>1</sup>; Ali Heidary<sup>1</sup>*; <sup>1</sup>Azad University

### 4:40 PM Cancelled

**Densification and Characterization of Boron Carbide Nanopowders through Field Assisted Sintering (FAST):** *Lionel Vargas-Gonzalez<sup>1</sup>; Chris Haines<sup>2</sup>; Darold Martin<sup>2</sup>*; <sup>1</sup>Army Research Laboratory; <sup>2</sup>US Army ARDEC

## Particulate Composites: Particulate Composites III

*Program Organizers:* Ivi Smid, Penn State; James Foley, Los Alamos National Laboratory; Ravi K. Enneti, Global Tungsten and Powders Corporation

Wednesday PM  
October 19, 2011

Room: C115  
Location: Columbus Con. Center

*Session Chair:* James Foley, Los Alamos National Lab

### 2:00 PM

**Innovative Design and Processing of Gas Atomized Precursor Powders to Generate Nano-Composite Microstructures in Ferritic Stainless Steels:** *Iver Anderson<sup>1</sup>; Joel Rieken<sup>2</sup>; Matthew Kramer<sup>1</sup>; Robert Odette<sup>3</sup>; Erich Stergar<sup>3</sup>*; <sup>1</sup>Ames Laboratory; <sup>2</sup>Iowa State University; <sup>3</sup>Univ. of California-Santa Barbara

### 2:40 PM

**Fabrication and Wear Behavior of Al-Ni/SiC Functional Gradient Materials:** *Carlos Leon-Patino<sup>1</sup>; Ena A. Aguilar-Reyes<sup>1</sup>; Sergio Mendez-Diaz<sup>1</sup>; Egberto Bedolla-Becerril<sup>1</sup>*; <sup>1</sup>Universidad Michoacana

### 3:00 PM

**Manufacture of Alumina/Aluminum Functionally Graded Material: Numerical Investigation of the Architecture and Evaluation of the Thermal Conductivity:** *Nabil Ferguen<sup>1</sup>; Emmanuel Bellenger<sup>1</sup>; Mohamed Guessasma<sup>1</sup>; Christine Pélegrin<sup>1</sup>; Claudia Cogné<sup>1</sup>*; <sup>1</sup>IUT - UPJV

### 3:20 PM Break

### 4:00 PM

**Dry Sliding Behavior of 6061-Al<sub>2</sub>O<sub>3</sub> Composite in Case of Y<sub>2</sub>O<sub>3</sub> Interface Coating:** *Serdar Altuner<sup>1</sup>; Ergun Kelesoglu<sup>1</sup>; Yildiz Technical University*

### 4:20 PM

**The Effects of Additives on the Corrosion, Microstructure, Mechanical Properties, and Machinability of 316L Stainless Steel:** *Daudi Waryoba<sup>1</sup>; Nicholas Carrier<sup>1</sup>; Jeffrey Johnson<sup>1</sup>; Mark Kopp<sup>1</sup>; Keith Rogers<sup>1</sup>*; <sup>1</sup>Penn State Dubois

## Phase Stability, Diffusion, Kinetics and their Applications (PSDK-VI): Phase Stability and Diffusional Processes II

*Program Organizers:* Jeffrey LaCombe, University of Nevada, Reno; Yongho Sohn, University of Central Florida; John Morral, Ohio State University; Ursula Kattner, National Institute of Standards and Technology; Abhijeet Misra, QuesTek Innovations LLC

Wednesday PM  
October 19, 2011

Room: C214  
Location: Columbus Con. Center

*Session Chairs:* Yong-Ho Sohn, University of Central Florida; Nagraj Kulkarni, Oak Ridge National Laboratory

### 2:00 PM

**4D Measurements of Interfacial Evolution during Coarsening:** *J Fife<sup>1</sup>; L. Aagesen<sup>2</sup>; A Johnson<sup>2</sup>; M Miksis<sup>2</sup>; E Lauridsen<sup>3</sup>; Peter Voorhees<sup>2</sup>*; <sup>1</sup>Paul Scherrer Institut; <sup>2</sup>Northwestern University; <sup>3</sup>RISO

### 2:40 PM

**Nucleation of second-phase near elastic defects in crystalline solids:** *Christina Bjerkén<sup>1</sup>; Ali Massih<sup>1</sup>*; <sup>1</sup>Malmö University

### 3:00 PM

**Microstructure Stability of Multi-Materials Systems with Adaptive Microstructures:** *Rongpei Shi<sup>1</sup>; Richard Cutler<sup>1</sup>; Ji-Cheng Zhao<sup>1</sup>; Yunzhi Wang<sup>1</sup>*; <sup>1</sup>The Ohio State University

### 3:20 PM Break

### 3:40 PM

**Expedited Processing of CIGS Photovoltaic Absorber Materials:** *Carelyn Campbell<sup>1</sup>*; <sup>1</sup>National Institute of Standards and Technology

### 4:20 PM

**Size Induced Transition from Partitioning to Non-Partitioning Local Equilibrium Kinetics in the Precipitation of Carbide Nano-Particles and Subsequent Formation of Transient Bimodal Particle Size Distribution:** *Qing Chen<sup>1</sup>; Gustaf Sterner<sup>1</sup>; Heng-Jeng Jou<sup>2</sup>; Anders Engström<sup>1</sup>*; <sup>1</sup>Thermo-Calc Software AB; <sup>2</sup>QuesTek Innovations LLC

### 4:40 PM

**Molecular Dynamics Simulations of Reaction, Diffusion and Segregation in Nanoscale Equiatomic Ni-Al Systems:** *Irina Belova<sup>1</sup>; Alexander Evteev<sup>1</sup>; Elena Levchenko<sup>1</sup>; Graeme Murch<sup>1</sup>*; <sup>1</sup>The University of Newcastle



5:00 PM

**Thermodynamic Stability and Al Diffusion Mechanism in Al<sub>5</sub>Fe<sub>2</sub>:** *Ridwan Sakidja*<sup>1</sup>; John Perepezko<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

5:20 PM

**Accelerated Kinetics of Surface Coating Growth by Diffusion near the Phase Transition Temperature: Mechanism of Growth of Boride Layers on Titanium:** *Biplab Sarma*<sup>1</sup>; K. S. Ravi Chandran<sup>1</sup>; <sup>1</sup>University of Utah

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## Processing, Microstructure and Properties of Cast Irons and Cast and Forged Specialty Steels: Forged and Specialty Steels

*Program Organizers:* Srinath Viswanathan, University of Alabama; Stephanie Will, The Timken Company

Wednesday PM  
October 19, 2011

Room: D142/143  
Location: Columbus Con. Center

*Session Chairs:* David Alexander, Los Alamos National Lab; Warren Garrison, Carnegie Mellon University

2:00 PM

**The Development of High Toughness, Cobalt Free, Secondary Hardening Steels:** *Warren Garrison*<sup>1</sup>; <sup>1</sup>Carnegie Mellon University

2:20 PM

**The Effects of Cobalt on the Ductile-to-Brittle Transition Temperature of Precipitation Strengthened Ultra-High Strength Steels:** *Warren Garrison*<sup>1</sup>; <sup>1</sup>Carnegie Mellon University

2:40 PM

**Optimization of Molybdenum Alloyed Carburizing Steels by Nb Microalloying for Large Gear Applications:** *Hardy Mohrbacher*<sup>1</sup>; *Frank Hippenstiel*<sup>2</sup>; <sup>1</sup>NiobelCon bvba; <sup>2</sup>Buderus Edelstahl GmbH

3:00 PM

**Studying the Resistance Against Destruction of Nitrided Steel, through Critical Opening of the Crack:** *Angel Zumbilev*<sup>1</sup>; *Nikolay Tonchev*<sup>1</sup>; *Ilia Zumbilev*<sup>1</sup>; <sup>1</sup>Technical University of Sofia, Plovdiv branch

3:20 PM Break

4:00 PM

**Tension-Compression Asymmetry in 21-6-9 High-Manganese Nitrogen-Strengthened Austenitic Stainless Steel:** *David Alexander*<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

4:20 PM

**Stress Rupture Properties and Carbide Reaction of Heat Resistant Cast Steels for Thin-Walled Castings of Automobile Engine:** *DOO HYUN KIM*<sup>1</sup>; *JUNG SUK LEE*<sup>2</sup>; *JONG MYOUNG KIM*<sup>2</sup>; *JONG HOON LEE*<sup>1</sup>; <sup>1</sup>Korea Institute of Materials Science; <sup>2</sup>Hyundai Kia Motors Corp.

4:40 PM Cancelled

**The Study on Microstructure and Thermal Fatigue Properties of HSS Rolls:** *Changzheng Xu*<sup>1</sup>; *Dale Sun*<sup>1</sup>; *Qiong Wu*<sup>1</sup>; *Hongquan Wen*<sup>1</sup>; *Heng Zhang*<sup>1</sup>; *Hongkui Zhang*<sup>1</sup>; <sup>1</sup>Baoshan Iron & Steel Company Limited

5:00 PM

**Study on High Temperature Mechanical Properties of 28MnCr5 Steel:** *Suzhou Wu*<sup>1</sup>; *Zhizheng Li*<sup>2</sup>; <sup>1</sup>Wuhan University of Science and Technology; <sup>2</sup>Beijing University of Science and Technology

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## Professor K. K. Chawla Honorary Symposium on Fibers, Foams and Composites: Science and Engineering: Fibers

*Program Organizers:* Nikhilesh Chawla, Arizona State University; Aldo Boccaccini, University of Erlangen-Nuremberg; Gary Gladysz, Trelleborg USA; Pedro D. Portella, Federal Institute of Testing and Materials BAM

Wednesday PM  
October 19, 2011

Room: D234  
Location: Columbus Con. Center

*Session Chairs:* Satish Kumar, Georgia Institute of Technology; Martin Schmucker, German Aerospace Center (DLR)

2:00 PM Invited

**Test Methods for the Tensile Evaluation of Ceramic Fibers:** *Edgar Lara-Curzio*<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory

2:40 PM Invited

**Microstructural Changes of Oxide Fibers at High Temperatures:** *Martin Schmucker*<sup>1</sup>; *Peter Mechnich*<sup>1</sup>; <sup>1</sup>German Aerospace Center (DLR)

3:20 PM Break

3:40 PM Invited

**Polyacrylonitrile/Carbon Nanotube Based Carbon Fibers:** *Satish Kumar*<sup>1</sup>; <sup>1</sup>Georgia Institute of Technology

4:20 PM

**Mechanical Behavior of Recycled Polyethylene/Piassaba Fiber Composites:** *João Miguez Suarez*<sup>1</sup>; *Amal Elzubair*<sup>1</sup>; <sup>1</sup>Instituto Militar de Engenharia

4:40 PM

**Natural Lignocellulosic Fibers as Special Engineering Materials:** *Sergio Monteiro*<sup>1</sup>; <sup>1</sup>State University of the Northern Rio de Janeiro - UENF

5:00 PM

**The Study of Mechanical Properties on Cellular Solids Using North American Porcupine Quills:** *Shih-Feng Chou*<sup>1</sup>; *Ruel Overfelt*<sup>1</sup>; <sup>1</sup>Auburn University

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## Recent Advances in Structural Characterization of Materials: Electron Backscatter Diffraction

*Program Organizers:* Chad Parish, Oak Ridge National Laboratory; Roumiana Petrova, New Jersey Institute of Tech; Jacob Jones, University of Florida; Zhonghou Cai, Argonne National Laboratory; Gang Chen, Ohio University

Wednesday PM  
October 19, 2011

Room: C212  
Location: Columbus Con. Center

*Session Chair:* Chad Parish, Oak Ridge National Laboratory

2:00 PM Invited

**A Novel Multi-Modal 3D Characterization System to Quantify Grain-Level Microstructural Features in Macro-Scale Volumes:** *Michael Uchic*<sup>1</sup>; *Michael Groeber*<sup>1</sup>; *Megna Shah*<sup>2</sup>; *Adam Shiveley*<sup>3</sup>; *Jonathan Spowart*<sup>1</sup>; <sup>1</sup>Air Force Research Laboratory; <sup>2</sup>UES, Inc.; <sup>3</sup>Universal Technology Corporation

2:40 PM Invited

**Using Electron Backscatter Diffraction to Measure Elastic and Plastic Strains in Weld Microstructures:** *Luke Brewer*<sup>1</sup>; <sup>1</sup>Naval Postgraduate School

## 3:20 PM Break

## 4:00 PM

**3D EBSD-FIB Characterization of Cold Roll Bonding Ti-Al-Nb Multilayer Sheets:** *Peng Qu<sup>1</sup>; Hui Xu<sup>1</sup>; Liming Zhou<sup>1</sup>; Viola Acoff<sup>1</sup>; <sup>1</sup>the University of Alabama*

## 4:20 PM Invited

**In-Situ Analysis of Deformation and Recrystallization Mechanisms in Magnesium Alloys:** *Carl Boehlert<sup>1</sup>; Zhe Chen<sup>1</sup>; Javier Llorca<sup>2</sup>; Ivan Gutiérrez-Urrutia<sup>3</sup>; Teresa Perez-Prado<sup>2</sup>; <sup>1</sup>Michigan State University; <sup>2</sup>IMDEA; <sup>3</sup>Max Planck Institute for Iron Research*

## 5:00 PM

**Full-Speed Simultaneous EBSD and Spectral Image EDS Acquisitions:** *Patrick Camus<sup>1</sup>; <sup>1</sup>Thermo Scientific*

## 5:20 PM

**Large Scale EBSD Collection and Analysis:** *Adam Shiveley<sup>1</sup>; Adam Pilchak<sup>2</sup>; Paul Shade<sup>1</sup>; Jay Tiley<sup>2</sup>; Gopal Viswanathan<sup>3</sup>; <sup>1</sup>Universal Technology Corporation; <sup>2</sup>Air Force Research Laboratory; <sup>3</sup>Universal Energy Systems, Inc*

## Solution-Based Processing for Ceramic Materials: Solution Synthesis of Ceramic Powders and Structures

*Program Organizer: Geoff Brennecke, Sandia National Laboratories*

Wednesday PM  
October 19, 2011

Room: C111  
Location: Columbus Con. Center

*Session Chair: Song Won Ko, The Pennsylvania State University*

## 2:00 PM Invited

**Solution-Based Processing of Dielectric and Ferroelectric Nanostructured Ceramic Oxides:** *Vincenzo Buscaglia<sup>1</sup>; <sup>1</sup>CNR*

## 2:20 PM Invited

**Tailor-Made Ceramic Nanocrystals by Organic-Ligand-Assisted Hydrothermal Synthesis**

*: Satoshi Ohara<sup>1</sup>; Kazuyoshi Sato<sup>2</sup>; Hiroya Abe<sup>1</sup>; <sup>1</sup>Osaka University; <sup>2</sup>Gunma University*

## 2:40 PM

**Investigation of Solution Combustion Synthesis and Precipitation Synthesis Conditions on TiO<sub>2</sub> and ZnO Nanopowder Characteristics:** *James Kelly<sup>1</sup>; Olivia Graeve<sup>1</sup>; <sup>1</sup>Alfred University*

## 3:00 PM

**Polymeric Precursor Synthesis of Ce(1-x)Bi<sub>2</sub>O(2-x/2) Powders Assisted by Sonic Cavitation:** *Siomara Martinez-Costilla<sup>1</sup>; Karinjilottu Padmadas<sup>2</sup>; Antonio Fuentes<sup>2</sup>; Sagrario Montemayor<sup>1</sup>; <sup>1</sup>Universidad Autonoma de Coahuila; <sup>2</sup>Cinvestav del IPN*

## 3:20 PM Break

## 4:00 PM Invited

**Novel Catalytic Phenomena of Mesoporous Silica Composites Controlled by Sol-Gel Processing:** *Junichi Hojo<sup>1</sup>; Shougo Yamashita<sup>1</sup>; Miki Inada<sup>1</sup>; Yumi Tanaka<sup>1</sup>; Naoya Enomoto<sup>1</sup>; <sup>1</sup>Kyushu University*

## 4:20 PM Invited

**Solution Synthesis of Perovskites and Complex Transition Metal Oxides:** *Maria Zaharescu<sup>1</sup>; <sup>1</sup>Institute of Physical Chemistry of the Romanian Academy*

## 4:40 PM

**Study of Reverse Micelle Nanoreactors for the Controlled Preparation of Zirconium Hydroxide Precipitates:** *Hoorshad Fathi<sup>1</sup>; James Kelly<sup>1</sup>; Raghunath Kanakala<sup>1</sup>; Daniel Davies<sup>1</sup>; Olivia Graeve<sup>1</sup>; <sup>1</sup>Alfred University*

## 5:00 PM

**Ultrasonically Assisted Synthesis of A<sub>2</sub>Zr<sub>y</sub>Ti<sub>2-y</sub>O<sub>7</sub> (A = Y, Dy, Gd) Pyrochlore and Fluorite-Type Solid Solutions:** *Maria Valdes-Ibarra<sup>1</sup>; Karinjilottu Padmasree<sup>1</sup>; Antonio Fuentes<sup>1</sup>; <sup>1</sup>Cinvestav del IPN*

## Steel Product Metallurgy and Applications: Processing and Performance I

*Program Organizer: Bhaskar Yalamanchili, Gerdau Ameristeel.com*

Wednesday PM  
October 19, 2011

Room: D132  
Location: Columbus Con. Center

*Session Chair: To Be Announced*

## 2:00 PM

**Effects of Initial Microstructure of Boron Steel Sheets on Hardenability and Mechanical Property after Hardening:** *Kazuo Hikita<sup>1</sup>; Nobusato Kojima<sup>1</sup>; <sup>1</sup>Sumitomo Metal Industries*

## 2:20 PM

**Predicting Formability of Sheared Holes in Advanced High Strength Sheet Steels:** *Robert Comstock<sup>1</sup>; Dustin Brown<sup>1</sup>; Daniel Scherrer<sup>1</sup>; <sup>1</sup>AK Steel*

## 2:40 PM

**High Performance Vacuum Carburizing Steels:** *Patrick Anderson<sup>1</sup>; Michael Burnett<sup>1</sup>; <sup>1</sup>The Timken Company*

## 3:00 PM

**In-Situ Observation of Martensitic Transformation in Low Carbon Steel:** *Naoya Shibuta<sup>1</sup>; Shoichi Nambu<sup>1</sup>; Kentaro Asakura<sup>1</sup>; Junya Inoue<sup>1</sup>; Toshihiko Koseki<sup>1</sup>; <sup>1</sup>The University of Tokyo*

## 3:20 PM Break

## 4:00 PM

**The Effects of Cooling Rate on Microstructure and Mechanical Properties in Automotive Connecting Rod Steels:** *Kelly Puzak<sup>1</sup>; John Speer<sup>1</sup>; <sup>1</sup>Colorado School of Mines*

## 4:20 PM

**Study of the Ti-Mn-Al-Si-O-S Complex Inclusions Inducing Intragranular Acicular Ferrite:** *chengwei yang<sup>1</sup>; <sup>1</sup>Wuhan Iron & Steel (Group) Corp.*

## 4:40 PM

**Evolution of Morphology, Size and Distribution of MnS Inclusions in Hot Forging Steel by Heat Treatment:** *Xiao Shao<sup>1</sup>; Xin Wang<sup>1</sup>; Min Jiang<sup>1</sup>; Wan Wang<sup>1</sup>; Xiang Huang<sup>1</sup>; <sup>1</sup>University of science and technology beijing*

## 5:00 PM Cancelled

**Post Weld Heat Treatment Response and Phase Transformation Behavior of F22 Steel:** *Eric Fusner<sup>1</sup>; John Lippold<sup>1</sup>; <sup>1</sup>OSU Welding and Joining Metallurgy Group*

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## Structural Materials for Aerospace and Defense: Challenges and Prospects: Aluminum and Titanium Alloys

*Program Organizer:* Roumiana Petrova, New Jersey Institute of Tech

Wednesday PM  
October 19, 2011

Room: D242/243  
Location: Columbus Con. Center

*Session Chair:* Timothy Langan, Surface Treatment Technologies, Inc.

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### 2:00 PM Invited

#### Damage Study in an AA 2024 T3 Panel Subjected to Explosive Loading:

*Tomoko Sano*<sup>1</sup>; Constantine Fountzoulas<sup>1</sup>; Chian-Fong Yen<sup>1</sup>; Charles Chen<sup>2</sup>; Mark Nansteel<sup>3</sup>; <sup>1</sup>US Army Research Laboratory; <sup>2</sup>US Department of Homeland Security; <sup>3</sup>Battelle Memorial Institute

### 2:40 PM

**A Study of the Effects of Minor Alloying Compositions on the Precipitation Hardening of Some Aluminum Alloys:** *Adebayo Badmos*<sup>1</sup>; Akindele Odeshi<sup>2</sup>; <sup>1</sup>Black Hawk College; <sup>2</sup>University of Saskatchewan

### 3:00 PM

**Microstructure and Corrosion Investigation of a Friction Stir Weld of AA 5083 H116 before and after Diode Laser Surface Treatment:** *Samar Kalita*<sup>1</sup>; *Benjamin Waldera*<sup>1</sup>; <sup>1</sup>Advanced Engineered Materials Center, University of North Dakota

### 3:20 PM Break

### 4:00 PM Invited

#### Optimizing Mechanical Properties of Bulk Nanostructured 7075 Al Alloy:

*Yonghao Zhao*<sup>1</sup>; P.V. Liddicoat<sup>2</sup>; X.Z. Liao<sup>2</sup>; Y.T. Zhu<sup>3</sup>; R. Z. Valiev<sup>4</sup>; E.J. Lavernia<sup>1</sup>; <sup>1</sup>University of California Davis; <sup>2</sup>University of Sydney, Australia; <sup>3</sup>North Carolina State University, Raleigh; <sup>4</sup>Ufa State Aviation Technical University, Russia

### 4:40 PM

**Determining the Variance and Distribution of Quantified Microstructure in a +  $\beta$  Processed Ti-6Al-4V:** *Meg Noble*<sup>1</sup>; Dan Huber<sup>1</sup>; John Sosa<sup>1</sup>; Santhosh Koduri<sup>1</sup>; Hamish Fraser<sup>1</sup>; <sup>1</sup>The Ohio State University

### 5:00 PM

**Characterization of Allotriomorphic Alpha in Titanium Alloys:** *Vikas Dixit*<sup>1</sup>; G.B. Viswanathan<sup>2</sup>; W.A.T. Clark<sup>1</sup>; H.L. Fraser<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Air Force Research Laboratory

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## Surface Properties of Biomaterials: Surface Modification

*Program Organizers:* Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Thomas Webster, Brown University; Sharmila Mukhopadhyay, Wright State University; Paul Calvert, University of Massachusetts; Mukesh Kumar, Biomet Inc

Wednesday PM  
October 19, 2011

Room: C216  
Location: Columbus Con. Center

*Session Chair:* Sharmila Mukhopadhyay, Wright State University

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### 2:00 PM

**Corrosion Mechanism of Anodized AZ91D and Its Biological Characterization:** *Dingchuan Xue*<sup>1</sup>; Yeohung Yun<sup>2</sup>; Mark Schulz<sup>1</sup>; Zhongyun Dong<sup>1</sup>; Zongqing Tan<sup>1</sup>; Vesselin Shanov<sup>1</sup>; <sup>1</sup>University of Cincinnati; <sup>2</sup>North Carolina A&T University

### 2:20 PM

**Sol-Gel Synthesis of Bio-Active Nanoporous Sodium Zirconate Coated on 316L Stainless Steel for Biomedical Application:** *Bavya Devi*<sup>1</sup>; *Nallaiyan Rajendran*<sup>1</sup>; <sup>1</sup>Anna University

### 2:40 PM

#### Cold Spray Process as an Alternative for Bioactive Coatings for Biomedical Applications:

*Ravinder Singh*<sup>1</sup>; Niraj Bala<sup>2</sup>; <sup>1</sup>Chitkara University; <sup>2</sup>Baba Banda Singh Bahadur Engineering College

### 3:00 PM

#### Titanium-HDPE Sandwich Composite with In-Built Current Generating Circuit for Bone Implant:

*Preetam Anbukarasu*<sup>1</sup>; Sangita Sridar<sup>1</sup>; <sup>1</sup>Anna University

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## Surface Protection for Enhanced Materials Performance: Science and Technology: Advanced Processing/Multi-Functional Coatings II

*Program Organizers:* Rodney Trice, Purdue University; Dongming Zhu, NASA Glenn Research Center; Daniel Mumm, University of California-Irvine; Hua-Tay Lin, Oak Ridge National Laboratory; Pravansu Mohanty, University of Michigan; Yutaka Kagawa, The University of Tokyo; Kang Lee, Rolls Royce; Charles Kay, ASB Industries, Inc.; Luc Pouliot, TECNAR Automation Ltd.

Wednesday PM  
October 19, 2011

Room: D230  
Location: Columbus Con. Center

*Session Chairs:* Charles Kay, ASM Industries; Luc Pouliot, TECNAR Automation Ltd.

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### 2:00 PM Invited

#### Field Assisted Sintering Technology (FAST) - Current and Future Thrusts:

*Sinthu Chanthapan*<sup>1</sup>; Sean Gephart<sup>1</sup>; Aaron Rape<sup>1</sup>; *Jogender Singh*<sup>1</sup>; Anil Kulkarni<sup>1</sup>; <sup>1</sup>Penn State University

### 2:40 PM

#### Friction Stir Processing of Cold Spray Depositions for Enhanced Surface Properties:

*Nicholas Procive*<sup>1</sup>; Dustin Bloomo<sup>1</sup>; Timothy Johnson<sup>1</sup>; Todd Curtis<sup>2</sup>; Michael West<sup>1</sup>; Bharat Jasthi<sup>2</sup>; <sup>1</sup>South Dakota School of Mines and Technology; <sup>2</sup>Arbegast Advanced Materials Processing and Joining Laboratory (AMP)

### 3:00 PM Cancelled

#### Features of Coatings Produced on Aluminum Substrates by Plasma Electrolytic Oxidation (PEO):

*Vahid Dehnavi*<sup>1</sup>; Sohrab Rohani<sup>1</sup>; David Shoesmith<sup>1</sup>; Ben Li Luan<sup>2</sup>; Mark Liu<sup>2</sup>; <sup>1</sup>The University of Western Ontario; <sup>2</sup>National Research Council Canada

### 3:20 PM Break

### 4:00 PM

#### Novel Properties of Zn Coating Deposited by Electro-Plasma Technology:

*Varshni Singh*<sup>1</sup>; *Pratheesh George*<sup>2</sup>; Edward Daigle<sup>2</sup>; R Reddy<sup>3</sup>; <sup>1</sup>Louisiana State University; <sup>2</sup>Cap Technologies; <sup>3</sup>University of Alabama

### 4:20 PM

#### Cleaning of Oxide Layer on Steel Surface by Electrolytic Plasma Process:

*Jiandong Liang*<sup>1</sup>; Peigen Zhang<sup>1</sup>; Kaiyang Wang<sup>1</sup>; Shengmin Guo<sup>1</sup>; Muhammad Wahab<sup>1</sup>; <sup>1</sup>Louisiana State University

### 4:40 PM

#### Cryogenic Processing: A Method to Enhance Material Properties by Low Temperature Treatment:

*Makarand Brahmangaonkar*<sup>1</sup>; Chandrashekar Gogte<sup>1</sup>; <sup>1</sup>MIT, Aurangabad

### 5:00 PM

#### Kinetics Formation of Aluminized Multifunctional Coating on Steel in SHS Condition:

*Borys Sereda*<sup>1</sup>; *Dmytro Sereda*<sup>1</sup>; <sup>1</sup>ZSEA

## Additive Manufacturing of Metals: Additive Manufacturing - An Array of Processes

*Program Organizers:* Ian D. Harris, EWI; Ulf Ackelid, Arcam AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, Ohio State University; Brent Stucker, University of Louisville

Thursday AM  
October 20, 2011

Room: D130  
Location: Columbus Con. Center

*Session Chair:* Suresh Babu, The Ohio State University

### 8:00 AM

**Additive Manufacturing of Metals and AMC:** *Ian Harris*<sup>1</sup>; <sup>1</sup>EWI

### 8:40 AM

**Fabrication of Precipitation Strengthened Surface Layers via Additive Friction Stir Processing:** *Jeff Rodelas*<sup>1</sup>; John Lippold<sup>1</sup>; <sup>1</sup>The Ohio State University

### 9:00 AM

**Gamma Titanium Aluminide with High Niobium Content Produced by Electron Beam Melting:** Sara Biamino<sup>1</sup>; Mathieu Terner<sup>1</sup>; Andrea Penna<sup>2</sup>; Ulf Ackelid<sup>3</sup>; Silvia Sabbadini<sup>4</sup>; Paolo Fino<sup>1</sup>; Matteo Pavese<sup>1</sup>; Claudio Badini<sup>1</sup>; <sup>1</sup>Politecnico di Torino; <sup>2</sup>Avioprop; <sup>3</sup>Arcam AB; <sup>4</sup>Avio SpA

### 9:20 AM

**Optimal Processing of Aluminum Alloys Using the DMLS Technology:** *Dustin Lindley*<sup>1</sup>; Ping Wang<sup>1</sup>; Steve Rengers<sup>1</sup>; <sup>1</sup>Morris Aerospace

### 9:40 AM Break

### 10:00 AM

**Laser-Assisted Twin-Wire Arc Spray:** *Ondrej Racek*<sup>1</sup>; Daniel Sordelet<sup>1</sup>; <sup>1</sup>Caterpillar, Inc.

### 10:20 AM Panel Discussion

### 10:50 AM Concluding Comments

## Advanced Developments in Electron Microscopy: Advanced Materials Applications

*Program Organizers:* Lawrence Allard, Oak Ridge National Laboratory; Velimir Radmilovic, Lawrence Berkeley National Laboratory; Paulo Ferreira, University of Texas at Austin; Daniel Ugarte, Universidade Estadual de Campinas - UNICAMP

Thursday AM  
October 20, 2011

Room: E160A  
Location: Columbus Con. Center

*Session Chair:* Velimir Radmilovic, University of Belgrade

### 8:00 AM Introductory Comments

### 8:20 AM Invited

**Characterizing Energy Materials in 3-D Using STEM Tomography:** *Ilke Arslan*<sup>1</sup>; <sup>1</sup>University of California, Davis

### 9:00 AM Invited

**Aberration-Corrected Scanning Transmission Electron Microscopy of Nanomaterials for Energy Applications:** *Jingyue Liu*<sup>1</sup>; Lawrence Allard<sup>2</sup>; <sup>1</sup>University of Missouri-St. Louis; <sup>2</sup>Oak Ridge National Laboratory

### 9:40 AM Break

### 10:00 AM

**"Spongy" Structure in a Pt-Co Fuel Cell Catalyst Characterized by High Angle Annular Dark Field Imaging and Chemical Mapping Based on Electron Energy Loss Spectroscopy:** *Zhongyi Liu*<sup>1</sup>; Zhiqiang Yu<sup>1</sup>; Junliang Zhang<sup>1</sup>; Frederick Wagner<sup>1</sup>; Huolin Xin<sup>2</sup>; Julia Mundy<sup>2</sup>; David Muller<sup>2</sup>; <sup>1</sup>General Motors; <sup>2</sup>Cornell University

### 10:20 AM

**Enhanced Eshelby Twist in 10-nm-Diameter InP Nanowires:** Luiz Tizei<sup>1</sup>; Alan Craven<sup>2</sup>; Luiz Zagonel<sup>3</sup>; Marcel Tencé<sup>4</sup>; Odile Stephan<sup>4</sup>; Thalita Chiaramonte<sup>1</sup>; Monica Cotta<sup>1</sup>; *Daniel Ugarte*<sup>1</sup>; <sup>1</sup>Universidade Estadual de Campinas - UNICAMP; <sup>2</sup>Univ. of Glasgow, School of Physics & Astronomy; <sup>3</sup>Laboratório Nacional de Luz Sincrotron (LNLS); <sup>4</sup>Lab. de Physique des Solides, Univ. Paris-Sud

### 10:40 AM

**Characterization of Nanoscale hcp Phase Nickel in a fcc Phase Nickel Thin Film:** *Shreyas Rajasekhara*<sup>1</sup>; Kameswaran Ganesh<sup>1</sup>; Khalid Hattar<sup>2</sup>; James Knapp<sup>2</sup>; Paulo Ferreira<sup>1</sup>; <sup>1</sup>The University of Texas - Austin; <sup>2</sup>Sandia National Laboratories

### 11:00 AM

**Characterization of Grain Boundary Type for Resistivity Studies of Nanocrystalline Cu Thin Films:** Amith Darbal<sup>1</sup>; Kameswaran Ganesh<sup>2</sup>; Xuan Liu<sup>1</sup>; Katayun Barmak<sup>1</sup>; Gregory Rohrer<sup>1</sup>; Dooho Choi<sup>1</sup>; Paulo Ferreira<sup>2</sup>; Bo Yao<sup>3</sup>; Andrew Warren<sup>3</sup>; Tik Sun<sup>3</sup>; Kelvin Coffey<sup>3</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>The University of Texas at Austin; <sup>3</sup>University of Central Florida

### 11:20 AM

**A Hollow-Cone Dark Field (HCDF) Transmission Electron Microscopy (TEM) Technique for Studying Fiber Texture in Polycrystalline Films:** *Patrick Cantwell*<sup>1</sup>; Eric Stach<sup>1</sup>; Matthew Schneider<sup>1</sup>; <sup>1</sup>Purdue University

### 11:40 AM Question and Answer Period

## Advances in Zinc-Based Coating Technologies for Steel Sheet : Advances in Processing and Characterization of Zinc-Coated Steel Sheet

*Program Organizer:* Frank Goodwin, International Zinc Association

Thursday AM  
October 20, 2011

Room: D144/145  
Location: Columbus Con. Center

*Session Chair:* A Chakraborty, McMaster University

### 8:00 AM

**Effect of Dew Point Temperature on Powdering Resistance of Galvannealed Coating on 590 Dual Phase Steel:** *Heejong Jung*<sup>1</sup>; Manho Na<sup>1</sup>; Man Been Moon<sup>2</sup>; Jongryoul Kim<sup>1</sup>; <sup>1</sup>hanyang university; <sup>2</sup>HYSCO

### 8:20 AM

**Remote Online Sensing of the Cleanliness of Metal Strips:** Ulises Crossa Archiropoli<sup>1</sup>; Silvio Ludueña<sup>1</sup>; Gabriel Cervellini<sup>2</sup>; Maria Pagliaricci<sup>2</sup>; Oscar Martínez<sup>3</sup>; <sup>1</sup>TOLKET S.R.L.; <sup>2</sup>Ternium Siderar; <sup>3</sup>TOLKET S.R.L. / CONICET

### 8:40 AM

**Corrosion Study and Influence of Metallic Additives of Zinc Electrodeposition on Mild Steel in Saline Environment:** *Fayomi Sunday*<sup>1</sup>; Popoola Patricia<sup>1</sup>; Popoola Olawale<sup>1</sup>; <sup>1</sup>Tshwane University of Technology, Pretoria south Africa

## Amorphous Materials: Common Issues within Science and Technology: Glass Technology

Program Organizer: Pierre Lucas, University of Arizona

Thursday AM  
October 20, 2011 Room: C211  
Location: Columbus Con. Center

Session Chair: S. Sundaram, Alfred University

### 11:00 AM

**Bioactive Glass Nanoparticles with Negative Zeta Potential:** *Ali Doostmohammadi*<sup>1</sup>; Ahmad Monshi<sup>1</sup>; Mohammad Hossein Fathi<sup>1</sup>; <sup>1</sup>Isfahan University of Technology

### 11:20 AM

**Quantitative Evaluation of Dissolved H<sub>2</sub> Concentration in Silica Glass by Thermal Desorption Spectrometry (TDS) in Ultra-High Vacuum:** *Yuko Tachibana*<sup>1</sup>; Masaaki Takata<sup>1</sup>; Yasuyuki Takimoto<sup>1</sup>; Tsuguhide Isemura<sup>1</sup>; Kiyoshi Yamamoto<sup>1</sup>; Shinya Kikugawa<sup>1</sup>; <sup>1</sup>Asahi Glass Co., Ltd.

### 11:40 AM

**Molecular Dynamics Simulation of the Locations, Atomistic Structures and Properties of Rare-Earth Doped Silicon Oxy-Nitride Intergranular Films in Silicon Nitride:** *YUN JIANG*<sup>1</sup>; Stephen Garofalini<sup>1</sup>; <sup>1</sup>Rutgers University

## Amorphous Materials: Common Issues within Science and Technology: Mechanical Properties of Glass I

Program Organizer: Pierre Lucas, University of Arizona

Thursday AM  
October 20, 2011 Room: C211  
Location: Columbus Con. Center

Session Chair: Ibrahim Guven, University of Arizona

### 8:00 AM

**Cracks in Glasses: How Do They Behave?:** *jean-pierre Guin*<sup>1</sup>; Sheldon Wiederhorn<sup>2</sup>; Theo Fett<sup>3</sup>; <sup>1</sup>CNRS @ University of Rennes I; <sup>2</sup>NIST; <sup>3</sup>Karlsruhe Institute for Technology

### 8:40 AM

**Compressive Damage Development in Glass:** *Kathryn Dannemann*<sup>1</sup>; Sidney Chocron<sup>1</sup>; Charles Anderson<sup>1</sup>; James Spencer<sup>1</sup>; <sup>1</sup>Southwest Research Institute

### 9:00 AM

**Water Diffusion into Phosphate Glasses and Its Relation to Slow Crack Growth Rate of the Glasses:** *Takashi Terashima*<sup>1</sup>; Minoru Tomozawa<sup>1</sup>; <sup>1</sup>Department of Materials Science and Engineering, Rensselaer Polytechnic Institute

### 9:20 AM

**Mechanical Properties of Glasses for Neutrino Detection:** *Kameron Chambliss*<sup>1</sup>; S.K. Sundaram<sup>1</sup>; William LaCourse<sup>1</sup>; <sup>1</sup>Alfred University

### 9:40 AM Break

## Amorphous Materials: Common Issues within Science and Technology: Mechanical Properties of Glass II

Program Organizer: Pierre Lucas, University of Arizona

Thursday AM  
October 20, 2011 Room: C211  
Location: Columbus Con. Center

Session Chair: Jean Pierre Guin, Universite de Rennes I

### 10:00 AM

**A New Approach to Fracture Modeling of Glass: Peridynamics:** *Ibrahim Guven*<sup>1</sup>; <sup>1</sup>The University of Arizona

### 10:40 AM

**Influence of Ultrahigh Surface Residual Stresses on Indentation Hardness and Impact Damage Propagation in Chemically Strengthened Glasses:** *Ghatu Subhash*<sup>1</sup>; <sup>1</sup>University of Florida

## Ceramic Matrix Composites: Mechanical Behavior

Program Organizers: Narottam Bansal, NASA Glenn Research Center; J. P. Singh, U.S. Army Research Laboratory; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Thursday AM  
October 20, 2011 Room: C112  
Location: Columbus Con. Center

Session Chair: Yutaka Kagawa, The University of Tokyo

### 8:00 AM Invited

**Mechanical Performance of Discontinuous Carbon Fiber-SiC Matrix Composites for Wear Components of High-Speed Train Applications:** *Yutaka Kagawa*<sup>1</sup>; <sup>1</sup>Research Center for Advanced Science and Technology, The University of Tokyo

### 8:40 AM

**Development of a Laser Test Facility for Thermomechanical Characterization of CMCs:** *Mark Novak*<sup>1</sup>; Frank Zok<sup>1</sup>; <sup>1</sup>UC Santa Barbara

### 9:00 AM

**High-Temperature Interlaminar Tension Test Method Development for Ceramic Matrix Composites:** *Todd Engel*<sup>1</sup>; <sup>1</sup>Hyper-Therm High-Temperature Composites, Inc.

### 9:20 AM

**Biaxial Flexure Testing of Advanced C/SiC and SiC/SiC Composites:** *John Shaw*<sup>1</sup>; Michael Rossol<sup>1</sup>; Mark Novak<sup>1</sup>; Frank Zok<sup>1</sup>; <sup>1</sup>University of California, Santa Barbara

### 9:40 AM Break

### 10:00 AM

**Notch Sensitivity of C/SiC and SiC/SiC Composites:** *Michael Rossol*<sup>1</sup>; John Shaw<sup>1</sup>; Frank Zok<sup>1</sup>; <sup>1</sup>University of California Santa Barbara

### 10:20 AM

**Identification of Damage Modes in Ceramic Matrix Composites Using Acoustic Emission Signal Pattern Recognition:** *Jacques Lamon*<sup>1</sup>; Nathalie Godin<sup>2</sup>; Mohamed R'Mili<sup>2</sup>; Pascal Reynaud<sup>2</sup>; Gilbert Fantozzi<sup>2</sup>; <sup>1</sup>CNRS; <sup>2</sup>INSA de Lyon/MATEIS Laboratory



10:40 AM

**Staggered Lamination Design for Enhancement of Mechanical Resistance of Ceramic-Metal Composite:** *Osayande Ighodaro*<sup>1</sup>; Okenwa Okoli<sup>2</sup>; Ben Wang<sup>2</sup>; <sup>1</sup>FAMU-FSU College of Engineering, High Performance Materials Institute (HPMI) Florida State University; <sup>2</sup>High Performance Materials Institute (HPMI), Florida State University

11:00 AM

**Effects of the Mode of Target Support on Foreign Object Damage in MI SiC/SiC and Oxide/Oxide CMCs:** *David Faucett*<sup>1</sup>; Sung Choi<sup>1</sup>; <sup>1</sup>NAVAIR

11:20 AM

**Sintering and Mechanical Behavior of Doped Cr<sub>3</sub>C<sub>2</sub>-NiCr Cermets: Commercial vs Steric Entrapment Method Produced 3Y-TZPs:** Ali OZER<sup>1</sup>; Yahya TÜR<sup>1</sup>; Waltraud KRIVEN<sup>2</sup>; <sup>1</sup>Gebze Institute of Technology; <sup>2</sup>University of Illinois at Urbana-Champaign

11:40 AM Cancelled

**In Situ Deformations Measurement during Multi-Materials Microwaves and Conventional Heating:** *Saunier Sébastien*<sup>1</sup>; <sup>1</sup>Ecole des Mines de Saint-Etienne

## Controlled Synthesis, Processing and Applications of Structural and Functional Nanomaterials: Three Dimensional Nanomaterials II

**Program Organizers:** Kathy Lu, Virginia Tech; Xudong Wang, University of Wisconsin - Madison; Eugene Olevsky, San Diego State University; Gurpreet Singh, Kansas State University; Nitin Chopra, The University of Alabama; Pu-Xian Gao, University of Connecticut; Jianyu Liang, Worcester Polytechnic Institute

Thursday AM  
October 20, 2011

Room: C123  
Location: Columbus Con. Center

Session Chair: Kathy Lu, Virginia Tech

8:00 AM Invited

**Low Temperature Sintering of Gadolinium-Doped Ceria (GDC) for Solid Oxide Fuel Cell Applications:** *Leon Shaw*<sup>1</sup>; Pasquale Lavorato<sup>1</sup>; <sup>1</sup>University of Connecticut

8:40 AM

**Kaolinite Effects on Sintering of Freeze-Cast Kaolinite-Silica Nanocomposite:** *Wenle Li*<sup>1</sup>; Kathy Lu<sup>1</sup>; John Walz<sup>1</sup>; <sup>1</sup>Virginia Tech

9:00 AM

**Highly Ordered TiO<sub>2</sub> Nanotube Arrays with Novel Arrangements by Focused Ion Beam Guidance:** *Bo Chen*<sup>1</sup>; Kathy Lu<sup>1</sup>; <sup>1</sup>Virginia Tech

9:20 AM Cancelled

**Thermal Characterization and Reaction Product Analysis of Porous Silicon Nanoenergetic Composites:** *Collin Becker*<sup>1</sup>; Conrad Stoldt<sup>2</sup>; <sup>1</sup>U.S. Army Research Laboratory; <sup>2</sup>University of Colorado

9:40 AM Break

10:00 AM Invited

**Dynamic Model for Coarsening during Sintering:** *Randall German*<sup>1</sup>; <sup>1</sup>San Diego State University

10:40 AM

**The Bottom Up Approach to Processing Ceramics Is Not Always the Best Solution:** *Richard Laine*<sup>1</sup>; Nathan Taylor<sup>1</sup>; Andrew Pottebaum<sup>1</sup>; Veli Uz<sup>1</sup>; <sup>1</sup>University of Michigan

11:00 AM

**Kinetics Control towards ZnO 3D Nanostructure:** *Jian Shi*<sup>1</sup>; Yong Ding<sup>2</sup>; Xudong Wang<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison; <sup>2</sup>Georgia Institute of Technology

11:20 AM

**Nanocomposites by Phase Separation in TiO<sub>2</sub>/SnO<sub>2</sub> System:** *Fred Dynys*<sup>1</sup>; Marie Helene Berger<sup>2</sup>; Alp Sehirlioglu<sup>3</sup>; Ali Sayir<sup>1</sup>; <sup>1</sup>NASA Glenn Research Center; <sup>2</sup>Centre des Matériaux Mines Paris; <sup>3</sup>Case Western Reserve University

11:40 AM

**Ultrahigh, Lightweight Al/Mg Alloys Processed by Severe Plastic Deformation:** *Nicholas Farkas*<sup>1</sup>; <sup>1</sup>Powdermet, Inc.

## Corrosion Protection through Metallic and Non-Metallic Coatings: Metallic and Refractory Coatings

**Program Organizers:** Narasi Sridhar, DNV; Rudolph Buchheit, Ohio State University

Thursday AM  
October 20, 2011

Room: D244/245  
Location: Columbus Con. Center

Session Chair: To Be Announced

8:00 AM

**High-Temperature Oxidation of Low-Temperature Pack Aluminide Coatings on Stainless Steels:** *Paul Calhoun*<sup>1</sup>; Ridwan Sakidja<sup>1</sup>; John Perepezko<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

8:20 AM

**Investigation of hot corrosion behavior of APS YSZ and Gd<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub>+YSZ composite thermal barrier coatings in Na<sub>2</sub>SO<sub>4</sub>+V<sub>2</sub>O<sub>5</sub> at 1050°C:** *M. Hamed Habibi*<sup>1</sup>; Li Wang<sup>1</sup>; Shengmin Guo<sup>1</sup>; <sup>1</sup>Louisiana State university

8:40 AM

**An Overview of Hot Corrosion in Waste to Energy Boiler Environment and Its Remedies:** Sukhminderbir Kalsi<sup>1</sup>; *Tejinder Sidhu*<sup>2</sup>; Harminder Singh<sup>3</sup>; <sup>1</sup>Amritsar college of Engineering & Technology, Amritsar, Punjab; <sup>2</sup>Shahedd Bhagat Singh College of Engineering & Technology, Ferozpur; <sup>3</sup>Guru Nanak Dev University, Regional Campus, Jalandhar

9:00 AM

**High Energy Density Coating Processing for Oil and Gas Applications:** Greg Engleman<sup>1</sup>; *Joshua Caris*<sup>1</sup>; Andrew Sherman<sup>1</sup>; Mario Medanic<sup>1</sup>; <sup>1</sup>MesoCoat

9:20 AM

**Electroless Ni-P and Ni-P-Al<sub>2</sub>O<sub>3</sub> Nanocomposite Coatings and Their Corrosion and Wear Resistance**  
: *Ajay Singh*<sup>1</sup>; Ankita Parashar<sup>1</sup>; <sup>1</sup>I.I.T.-Roorkee

9:40 AM Break

10:00 AM

**Comparative Study of Aluminide Coatings on Mild Steel by Different Aluminizing Techniques:** Gaurav Avasthi<sup>1</sup>; Munjal Mehta<sup>1</sup>; Dilip Avtani<sup>2</sup>; *Nirav Jamnapara*<sup>2</sup>; Gunjan Gupta<sup>3</sup>; Narendra Chauhan<sup>2</sup>; Ghanshyamsinh Jhala<sup>2</sup>; <sup>1</sup>Indus Institute of Technology; <sup>2</sup>Institute for Plasma Research; <sup>3</sup>Indian Institute of Technology Bombay

10:20 AM

**Corrosion Resistance of Diamond-Like Carbon (DLC) Lined Pipe to High Temperature and Pressure Hydrogen Sulfide/Carbon Dioxide Environments:** *Peter Ellis*<sup>1</sup>; Brian Chambers<sup>1</sup>; Bill Boardman<sup>2</sup>; <sup>1</sup>Honeywell Corrosion Solutions; <sup>2</sup>Sub-One Technology

10:40 AM

**Introduction to Tantalum-Surface Alloy Technology and Review of Performance in High-Temperature Acid Environments:** *Brian Chambers*<sup>1</sup>; Dean Gambale<sup>2</sup>; <sup>1</sup>Honeywell Corrosion Solutions; <sup>2</sup>Tantaline

11:00 AM

**Electrochemical Evaluation of Thermally Sprayed WC-Co/Cr for Hard Chrome Replacement:** *Ravi Dey*<sup>1</sup>; Christopher Weyant<sup>1</sup>; <sup>1</sup>Stony Brook University

11:20 AM

**Characterization of Copper Coatings on ASTM B221 Alloy by Low Pressure Cold Spray Process:** *Tarun Goyal*<sup>1</sup>; *T S Sidhu*<sup>2</sup>; R S Walia<sup>1</sup>; H.P.S. Sidhu<sup>3</sup>; <sup>1</sup>PEC University of Technology; <sup>2</sup>SBSCET; <sup>3</sup>Shaheed Udham Singh Women Engineering College

## Deformation and Transitions at Grain Boundaries: Effects of Defects and Chemistry on Grain Boundaries

*Program Organizers:* Thomas Bieler, Michigan State University; Douglas Spearot, University of Arkansas; Rozaliya Barabash, Oak Ridge National Laboratory; Shen Dillon, University of Illinois at Urbana-Champaign; Jian Luo, Clemson University

Thursday AM  
October 20, 2011

Room: C121  
Location: Columbus Con. Center

*Session Chairs:* Shen Dillon, University of Illinois at Urbana-Champaign; Yue Qi, General Motors R&D

8:00 AM Invited

**Grain Boundary Migration during Recrystallization:** *Dorte Jensen*<sup>1</sup>; <sup>1</sup>DTU Risø

8:20 AM Cancelled

**Recovery and Recrystallization of Nb Single Crystals Heated after Unlimited Straining in the Bridgman Anvils:** *Vladimir Levit*<sup>1</sup>; Vitaliy Pilyugin<sup>2</sup>; Lyudmila Voronova<sup>2</sup>; Tatiana Chaschukhina<sup>2</sup>; Aleksandr Vasiliev<sup>3</sup>; <sup>1</sup>VITALD LLC; <sup>2</sup>Metal Physics Institute RAS; <sup>3</sup>Kurchatov Institute

8:40 AM Invited

**Atomistic Predictions on Chemical Effects at Grain Boundaries:** *Yue Qi*<sup>1</sup>; <sup>1</sup>General Motors R&D

9:00 AM

**Effect of Grain Boundary Character on the Segregation of Impurities and Point Defects to Grain Boundaries in Fe:** *Mark Tschopp*<sup>1</sup>; Kiran Solanki<sup>1</sup>; Nathan Rhodes<sup>1</sup>; Mark Horstemeyer<sup>1</sup>; Fei Gao<sup>2</sup>; Xin Sun<sup>2</sup>; Moe Khaleel<sup>2</sup>; <sup>1</sup>Mississippi State University; <sup>2</sup>Pacific Northwest National Laboratory

9:20 AM Invited

**Location of La and Lu in Rare-Earth Doped Intergranular Films in Silicon Nitride: Effect of Structure on Properties:** *Stephen Garofalini*<sup>1</sup>; Yun Jiang<sup>1</sup>; <sup>1</sup>Rutgers University

9:40 AM Break

10:00 AM Invited

**Molecular Dynamics Simulation of Grain Boundary Network Stability to Irradiation:** *James Belak*<sup>1</sup>; Bryan Reed<sup>1</sup>; Thomas LaGrange<sup>1</sup>; Vasily Bulatov<sup>1</sup>; Joel Bernier<sup>1</sup>; Ming Tang<sup>1</sup>; Mukul Kumar<sup>1</sup>; <sup>1</sup>Lawrence Livermore National Laboratory

10:20 AM Invited

**Predicting Defect Interactions with Interfaces and Grain Boundaries Using Misfit Dislocation Models:** *Michael Demkowicz*<sup>1</sup>; Aurélien Vattré<sup>2</sup>; <sup>1</sup>Massachusetts Institute of Technology; <sup>2</sup>CEA-DAM IdF

10:40 AM

**Analysis of Variant Selection in a Ti-6Al-4V Ingot:** *Gordon Sargent*<sup>1</sup>; Adam Pilchak<sup>2</sup>; Ayman Salem<sup>2</sup>; Michael Glavicic<sup>3</sup>; Kacey Kinsel<sup>4</sup>; S Semiatin<sup>2</sup>; <sup>1</sup>Consultant; <sup>2</sup>Materials and Manufacturing Directorate; <sup>3</sup>Rolls-Royce Corporation; <sup>4</sup>Wright State University

11:00 AM Invited

**The Relationship between Grain Boundary Energies and Grain Boundary Complexion Transitions:** *Shen Dillon*<sup>1</sup>; Martin Harmer<sup>1</sup>; *Gregory Rohrer*<sup>1</sup>; <sup>1</sup>Carnegie Mellon University

11:20 AM

**Application of Phase Field Crystal Modeling to Studying Coupled Grain Boundary Migration and Grain Rotation:** *Vishal Yadav*<sup>1</sup>; Nele Moelans<sup>2</sup>; <sup>1</sup>KU Leuven; <sup>2</sup>Katholieke Universiteit Leuven

11:40 AM Cancelled

**Construction of Failure Envelope: A Practical Way for Multi-Scale Modeling of Mechanical Properties in Ceramics and Their Grain Boundaries:** *Wai-Yim Ching*<sup>1</sup>; Sitaram Aryal<sup>1</sup>; Anil Misra<sup>2</sup>; <sup>1</sup>University of Missouri-Kansas City; <sup>2</sup>University of Kansas

## Energy Storage: Materials, Systems and Applications: Hydrogen Storage and Thermoelectric Materials

*Program Organizers:* Zhenguo "Gary" Yang, Pacific Northwest National Laboratory; Terry Holesinger, Los Alamos National Laboratory; Xingbo Liu, West Virginia University; Chun Lu, Siemens Energy, Inc.

Thursday AM  
October 20, 2011

Room: C223  
Location: Columbus Con. Center

*Session Chairs:* Ji-Cheng Zhao, Ohio State University; Xueyan Song, West Virginia University

8:00 AM Introductory Comments

8:20 AM

**Characterization of the Mechanical Properties of Two N-Type and One P-Type Sb-Based Skutterudite Thermoelectric Compounds:** *Robert Schmidt*<sup>1</sup>; Eldon Case<sup>1</sup>; Jennifer Ni<sup>1</sup>; Jeffrey Sakamoto<sup>1</sup>; Rosa Trejo<sup>2</sup>; Edgar Lara-Curzio<sup>2</sup>; E. Payzant<sup>2</sup>; Melanie Kirkham<sup>2</sup>; Roberta Peascoe-Meisner<sup>2</sup>; <sup>1</sup>Michigan State University; <sup>2</sup>Oak Ridge National Laboratory

8:40 AM

**Optical Indices of Refraction for  $\text{Ce}_{0.1}\text{Co}_{0.95}\text{Pd}_{0.05}\text{Te}_{0.05}\text{Sb}_{0.3}\text{Ag}_{0.86}\text{Pb}_{0.19}\text{Sb}_{1.0}\text{Te}_{2.0}$  and  $(\text{Pb}_{0.95}\text{Sn}_{0.05}\text{Te})_{0.92}(\text{PbS})_{0.08}-0.055\% \text{PbI}_2$ :** *Jennifer Ni*<sup>1</sup>; Eldon Case<sup>1</sup>; Jeffrey Sakamoto<sup>1</sup>; Edward Timm<sup>1</sup>; Chun-I Wu<sup>1</sup>; Tim Hogan<sup>1</sup>; Benjamin Oberts<sup>1</sup>; Gary Blanchard<sup>1</sup>; <sup>1</sup>Michigan State University

9:00 AM

**The Temperature-Dependent Coefficient of Thermal Expansion for  $(\text{Pb}_{0.95}\text{Sn}_{0.05}\text{Te})_{0.92}(\text{PbS})_{0.08}-0.055\% \text{PbI}_2$  Thermoelectric Material:** *Jennifer Ni*<sup>1</sup>; Eldon Case<sup>1</sup>; Ryan Stewart<sup>1</sup>; Chun-I Wu<sup>1</sup>; Tim Hogan<sup>1</sup>; Rosa Trejo<sup>2</sup>; Melanie Kirkham<sup>2</sup>; Andrew Payzant<sup>2</sup>; Edgar Lara-Curzio<sup>2</sup>; Steven Girard<sup>3</sup>; Mercouri Kanatzidis<sup>3</sup>; <sup>1</sup>Michigan State University; <sup>2</sup>Oak Ridge National Laboratory; <sup>3</sup>Northwestern University

9:20 AM

**Synthesis and Characterization of  $\beta$ -Gallia-Rutile Intergrowth Structures for Thermoelectric Applications:** *Michael Saterlie*<sup>1</sup>; Raghunath Kanakala<sup>1</sup>; Doreen Edwards<sup>1</sup>; Olivia Graeve<sup>1</sup>; <sup>1</sup>Alfred University

## 9:40 AM Break

### 10:00 AM

**Effect of Alloying Elements on Surface Structure of CuPd B2 Hydrogen Separation Membranes:** *De Nyago Tafeni*<sup>1</sup>; Michael Gao<sup>1</sup>; Rongxiang Hu<sup>1</sup>; Omer Dogan<sup>2</sup>; <sup>1</sup>National Energy Technology Lab - URS; <sup>2</sup>National Energy Technology Lab

### 10:20 AM

**Fatigue Testing of Hydrogen-Exposed Austenitic Stainless Steel in an Undergraduate Materials Laboratory:** *Patrick Ferro*<sup>1</sup>; <sup>1</sup>Gonzaga University

### 10:40 AM

**Lightweight Laves Phases for Hydrogen Storage:** *Beau Billet*<sup>1</sup>; Ji-Cheng Zhao<sup>1</sup>; <sup>1</sup>Ohio State University

### 11:00 AM

**The Absorption of Hydrogen on Low Pressure Hydride Materials:** *Gregg Morgan*<sup>1</sup>; Paul Korinko<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

### 11:20 AM

**Ion Beam Preparation of Li-Ion Battery Electrodes Li-Ion:** *Edward Gorzkowski*<sup>1</sup>; David Rowenhorst<sup>1</sup>; Dean Wheeler<sup>1</sup>; <sup>1</sup>US Naval Research Lab

### 11:40 AM

**Poly-methylated Phenanthrenes as a Liquid Media for Hydrogen Storage:** *Mikhail Redko*<sup>1</sup>; <sup>1</sup>Powdermet, Inc.

## Failure Analysis and Prevention: Corrosion and Coatings

**Program Organizers:** Andrew Spowage, The University of Nottingham, Malaysia Campus; Tom Ackerson, IMR Metallurgical Services; Larry Hanke, Materials Evaluation and Engineering, Inc

Thursday AM  
October 20, 2011

Room: D235  
Location: Columbus Con. Center

**Session Chairs:** Greg Quickel, Det Norske Veritas (U.S.A.), Inc.; Brandon Rollins, Det Norske Veritas (U.S.A.), Inc.; John Mickalonis, Savannah River National Laboratory

### 8:00 AM

**Failure Analysis of Two 80 HP Multiport Boilers:** *Erhan Ulvan*<sup>1</sup>; <sup>1</sup>Acuren Group Inc.

### 8:20 AM

**Degradation Evaluation of Heavy Water Drums and Tanks:** *John Mickalonis*<sup>1</sup>; Philip Vormelker<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

### 8:40 AM

**The Role of Corrosion and Oxidation in High Temperature Failures: Valuable Witness or Vile Perpetrator?:** *BRUCE MCMORDIE*<sup>1</sup>; <sup>1</sup>BGM Coating Advisors LLC

### 9:00 AM

**Detection of Incipient SCC Damage in Primary Loop Piping Using Fiber Optic Strain Gages:** *Benjamin Jackson*<sup>1</sup>; James Wall<sup>2</sup>; Mike Cronin<sup>1</sup>; <sup>1</sup>Intertek APTECH; <sup>2</sup>Electric Power Research Institute (EPRI)

### 9:20 AM Cancelled

**Degradation Analysis of Plungers Coming from a Printing Press:** *Marina Banuta*<sup>1</sup>; <sup>1</sup>SGS Canada

## 9:40 AM Break

### 10:00 AM

**Application of Internal Corrosion Failure Analysis to Reducing Corporate Risk:** *Richard Eckert*<sup>1</sup>; <sup>1</sup>Det Norske Veritas USA Inc

### 10:40 AM

**Failure of Top-Side Gas Line Elbow in the South China Sea:** *Andrew Spowage*<sup>1</sup>; Nigel Brewitt<sup>2</sup>; <sup>1</sup>Nottingham Uni; <sup>2</sup>MTIS

### 11:00 AM

**Failure Analysis of Thermowells for Batch Evaporators:** *John Mickalonis*<sup>1</sup>; Zane Nelson<sup>1</sup>; Philip Vormelker<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

### 11:20 AM

**One Too Many Drips for This Natural Gas Pipeline:** *G.T. Quickel*<sup>1</sup>; *K.M. Krajewski*<sup>1</sup>; J.A. Beavers<sup>1</sup>; <sup>1</sup>Det Norske Veritas (U.S.A.), Inc.

### 11:40 AM

**Intermetallic Precipitates in Stainless Steels - Some Failure Case Histories from the Norwegian Oil and Gas Industry:** *Lene Anita Marken*<sup>1</sup>; Gisle Rørvik<sup>1</sup>; Inge Morten Kulbotten<sup>1</sup>; Mads Aursand<sup>1</sup>; <sup>1</sup>Statoil ASA

## Fatigue and Microstructure: A Symposium on Recent Advances: Crack Growth and Fracture

**Program Organizers:** Amit Shyam, Oak Ridge National Laboratory; Sushant Jha, Air Force Research Laboratory/Universal Technology Corporation; Michael Caton, US Air Force Research Laboratory

Thursday AM  
October 20, 2011

Room: D240/241  
Location: Columbus Con. Center

**Session Chairs:** Michael Caton, Air Force Research Laboratory; Michael Marx, Saarland University

### 8:00 AM

**The Relationship of Microstructure to Intergranular Crack Growth of a Nickel-Based Superalloy:** *Hamouda Ghonem*<sup>1</sup>; <sup>1</sup>University of Rhode Island

### 8:40 AM

**Mechanism of Sustained Macroscopic Deflected Fatigue Crack Growth in the Nickel Based Superalloy Udimet 720:** *Christian Schoettle*<sup>1</sup>; Philippa Reed<sup>1</sup>; Marco Starink<sup>1</sup>; Ian Sinclair<sup>1</sup>; Daniel Child<sup>2</sup>; Geoff West<sup>2</sup>; Rachel Thomson<sup>2</sup>; <sup>1</sup>University of Southampton; <sup>2</sup>Loughborough University

### 9:00 AM

**Effects of Sensitization on Fracture and Fatigue of 5XXX Al Alloys:** *Justin Brosi*<sup>1</sup>; *John Lewandowski*<sup>1</sup>; <sup>1</sup>Case Western Reserve Univ

### 9:20 AM

**Determining Local Crack Growth Rates for Small Cracks in Inhomogeneous Materials:** *Angelika Brueckner-Foit*<sup>1</sup>; Frank Zeismann<sup>1</sup>; Pascal Pitz<sup>1</sup>; <sup>1</sup>University of Kassel

## 9:40 AM Break

### 10:00 AM

**Focused Ion Beam Tomography to Quantify the Fatigue Resistance of Grain Boundaries:** *Michael Marx*<sup>1</sup>; Wolfgang Schaeff<sup>1</sup>; <sup>1</sup>Saarland University

### 10:40 AM

**Microstructural and Environmental Effects on Fatigue Crack Growth in 7075 Aluminum Alloy:** *Aboozar Bonakdar*<sup>1</sup>; Jason Williams<sup>1</sup>; *Nikhilesh Chawla*<sup>1</sup>; <sup>1</sup>Arizona State University

### 11:00 AM

**The Small Fatigue Crack Growth Behavior of an AM60 Magnesium Alloy:** *Zhe Chen*<sup>1</sup>; Amit Shyam<sup>2</sup>; Jack Huang<sup>3</sup>; Ray Decker<sup>3</sup>; Steve LeBeau<sup>3</sup>; Carl Boehlert<sup>1</sup>; <sup>1</sup>Michigan State University; <sup>2</sup>Oak Ridge National Laboratory; <sup>3</sup>NanoMAG, LLC.

11:20 AM

**A 3-D Quantitative Crystallographic Model for Short Fatigue Crack Propagation through Grain Boundaries in High Strength Al Alloys:** *Wei Wen<sup>1</sup>; Tongguang Zhai<sup>1</sup>; <sup>1</sup>University of Kentucky*

11:40 AM

**Effect of Friction Stir Processing on the Fatigue Performance of a Cast Al-Si Alloy:** *Saumyadeep Jana<sup>1</sup>; Rajiv Mishra<sup>2</sup>; Glenn Grant<sup>1</sup>; John baumann<sup>3</sup>; <sup>1</sup>PNNL; <sup>2</sup>Missouri University of Science & Technology; <sup>3</sup>boeing*

## Glass and Optical Materials: Structure and Properties Characterization in Glass

*Program Organizer:* Pierre Lucas, University of Arizona

Thursday AM  
October 20, 2011

Room: C110  
Location: Columbus Con. Center

*Session Chair:* Steve W. Martin, Iowa State University

8:00 AM

**Diffusion of Sodium in Sodium Boroaluminosilicate Glasses:** *Xinwei Wu<sup>1</sup>; Jeremy Moskowit<sup>1</sup>; Ruediger Dieckmann<sup>1</sup>; <sup>1</sup>Cornell University*

8:20 AM

**Formation of Ga-As Nanocrystals in Glasses:** *Kody Bornstein<sup>1</sup>; John Rich<sup>1</sup>; S. Sundaram<sup>1</sup>; <sup>1</sup>Alfred University*

8:40 AM

**Structure of Liquid and Glassy CaSiO<sub>3</sub>: A Levitation and Neutron Diffraction with Isotopic Substitution Study:** *Lawrie Skinner<sup>1</sup>; <sup>1</sup>SUNY, stony brook / Argonne*

9:00 AM

**High-Temperature Raman Spectroscopic Investigations of the Two-Alkali Borate Melts:** *Armenak Osipov<sup>1</sup>; Leyla Osipova<sup>1</sup>; <sup>1</sup>Institute of Mineralogy IB RAS*

9:20 AM

**X-Ray Diffraction and IR Investigation of the Structure of Pressurized Silica Glass:** *Chia-Ying Li<sup>1</sup>; Jonathan Price<sup>2</sup>; Minoru Tomozawa<sup>1</sup>; E. Bruce Watson<sup>1</sup>; <sup>1</sup>Rensselaer Polytechnic Institute; <sup>2</sup>Midwestern State University*

## Hardness across the Multi-Scales of Structure and Loading Rate: Applications II

*Program Organizers:* Ronald Armstrong, University of Maryland; David Bahr, Washington State University; Naresh Thadhani, Georgia Institute of Technology; Stephen Walley, Physics and Chemistry of Solids Cavendish Laboratory

Thursday AM  
October 20, 2011

Room: C210  
Location: Columbus Con. Center

*Session Chairs:* Stephen Walley, University of Cambridge; Michel Barsoum, Drexel University

8:00 AM Invited

**The Effect of Microstructure on the Hardness of Submicron Thin Films and Nanostructured Devices:** *Steve Bull<sup>1</sup>; Lisa Sanderson<sup>1</sup>; Noushin Moharrami<sup>1</sup>; Adrian Oila<sup>1</sup>; <sup>1</sup>Newcastle University*

8:20 AM

**The Effect of Interfaces on Hardness in Cu/Nb Nanolamellar Multilayer Composites:** *John Carpenter<sup>1</sup>; Sven Vogel<sup>1</sup>; Thomas Wynn<sup>1</sup>; Rodney McCabe<sup>1</sup>; Irene Beyerlein<sup>1</sup>; Nathan Mara<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory*

8:40 AM Invited

**Assessment of Mechanical Behavior of Ti Cold Spray Coatings by Multi-Scale Hardness Testing:** *Richard Chromik<sup>1</sup>; Dina Goldbaum<sup>1</sup>; Jihane Ajaja<sup>1</sup>; <sup>1</sup>McGill University*

9:00 AM Invited

**Effect of Annealing Treatment on Hardness in Bulk Nanocrystalline Nickel:** *Anna Torrents<sup>1</sup>; Farghalli Mohamed<sup>1</sup>; <sup>1</sup>University of California, Irvine*

9:20 AM

**Confocal Laser Scanning Microscopy (CLSM) as a Possible Tool to Measure Indentations and Fracture Surfaces:** *Jennifer Ni<sup>1</sup>; Eldon Case<sup>1</sup>; <sup>1</sup>Michigan State University*

9:40 AM Break

10:00 AM Invited

**Nanoindentation Studies of Lithiated Silicon:** *Lucas Berla<sup>1</sup>; Seok Woo Lee<sup>1</sup>; Andrew Jennings<sup>2</sup>; Julia Greer<sup>2</sup>; Yi Cui<sup>1</sup>; William Nix<sup>1</sup>; <sup>1</sup>Stanford University; <sup>2</sup>California Institute of Technology*

10:20 AM

**Using Hardness of Etched Surfaces for Characterization of Degree of Sensitization in Al-Mg Marine Service Alloys:** *Ronald Holtz<sup>1</sup>; <sup>1</sup>Naval Research Laboratory*

10:40 AM

**The Indentation Response of the Coarsened Precipitates in a Re-Bearing Superalloy:** *Bin Gan<sup>1</sup>; Hideyuki Murakami<sup>2</sup>; Sammy Tin<sup>1</sup>; <sup>1</sup>Illinois Institute of Technology; <sup>2</sup>National Institute for Materials Science*

11:00 AM Invited

**Surface Dislocation Nucleation by Wedge Indenter Contacts:** *Jing Zhao<sup>1</sup>; Lifeng Ma<sup>1</sup>; Alexander Korsunsky<sup>2</sup>; <sup>1</sup>Xi'an Jiaotong University; <sup>2</sup>Oxford University*

11:20 AM Invited

**Viscoelasticity and High Buckling Stress of Dense Carbon Nanotube Brushes:** *Siddhartha Pathak<sup>1</sup>; William Mook<sup>2</sup>; Z. Goknur Cambaz<sup>3</sup>; M.T. Ubieto-Puertolas<sup>4</sup>; Min Heon<sup>4</sup>; J. Gregory Swadener<sup>5</sup>; Johann Michler<sup>2</sup>; Surya Kalidindi<sup>4</sup>; Yury Gogotsi<sup>4</sup>; <sup>1</sup>Caltech; <sup>2</sup>EMPA - Swiss Federal Laboratories for Materials Testing and Research; <sup>3</sup>Cankaya University; <sup>4</sup>Drexel University; <sup>5</sup>Aston University*

11:40 AM Invited

**Strain-Hardening Coefficient of Aluminum Alloys Determined through Profiles of Spherical Indentation Hardness:** *Giuseppe Pintaude<sup>1</sup>; Alessandro Hoechele<sup>1</sup>; Gustavo Cipriano<sup>2</sup>; <sup>1</sup>UTFPR; <sup>2</sup>Petrobras*

## Integrated Computational Materials Engineering: Modeling and Simulation Applied to Metals Processing: Modeling and Simulation of Deformation and Associated Microstructure and Mechanical Properties

*Program Organizer:* David Furrer, Pratt & Whitney

Thursday AM  
October 20, 2011

Room: C213  
Location: Columbus Con. Center

*Session Chair:* Fan Zhang, Penn State University

8:00 AM

**An Integrated Framework of Experiments and Simulations for Investigating Elastic-Plastic Deformation of Metallic Polycrystals:** *Jay Schuren<sup>1</sup>; Su Leen Wong<sup>2</sup>; Paul Dawson<sup>2</sup>; Matthew Miller<sup>2</sup>; <sup>1</sup>AFRL; <sup>2</sup>Cornell University*



8:20 AM

**Phase Field Modeling of Grain Growth and Recrystallization in Elastoviscoplasticly Deformed Polycrystals:** *Saswata Bhattacharya*<sup>1</sup>; Tae Wook Heo<sup>1</sup>; Kunok Chang<sup>1</sup>; Ricardo Lebensohn<sup>2</sup>; Zi-Kui Liu<sup>1</sup>; Suveen Mathaudhu<sup>3</sup>; Long-Qing Chen<sup>1</sup>; <sup>1</sup>Pennsylvania State University; <sup>2</sup>Los Alamos National Laboratory; <sup>3</sup>Army Research Laboratory

8:40 AM

**Elastic Strain Energy Effects on Grain Boundary Segregation and Solute Drag in Grain Boundary Motion: A Phase-Field Study:** *Tae Wook Heo*<sup>1</sup>; Saswata Bhattacharya<sup>1</sup>; Long-Qing Chen<sup>1</sup>; <sup>1</sup>The Pennsylvania State University

9:00 AM

**Three Dimensional Elasto-Plastic Phase Field Simulations of Martensitic Transformation in Fe-C Polycrystalline Alloy:** *Amer Malik*<sup>1</sup>; Gustav Amberg<sup>1</sup>; <sup>1</sup>KTH

9:20 AM

**Phase-Field Simulation of Elastic Properties of Polycrystalline Magnesium:** *Guang Sheng*<sup>1</sup>; Saswata Bhattacharya<sup>1</sup>; Hui Zhang<sup>1</sup>; Kunok Chang<sup>1</sup>; Suveen Mathaudhu<sup>2</sup>; Zi-Kui Liu<sup>1</sup>; Long-Qing Chen<sup>1</sup>; <sup>1</sup>The Pennsylvania State University; <sup>2</sup>U.S. Army Research Laboratory

9:40 AM Break

10:00 AM

**Precipitation Simulation of Multi-Component Nickel and Aluminum Alloys under the ICME Framework:** *Weisheng Cao*<sup>1</sup>; Fan Zhang<sup>1</sup>; Shuanglin Chen<sup>1</sup>; Chuan Zhang<sup>1</sup>; Y. Austin Chang<sup>2</sup>; <sup>1</sup>CompuTherm LLC; <sup>2</sup>University of Wisconsin - Madison

10:20 AM

**Self-Similar Evolution of a Precipitate in Homogeneous Elastic Media:** *Shuwang Li*<sup>1</sup>; Amlan Barua<sup>1</sup>; Xiaofan Li<sup>1</sup>; John Lowengrub<sup>2</sup>; <sup>1</sup>Illinois Institute of Technology; <sup>2</sup>UC-Irvine

10:40 AM

**An Integrated Heat Treatment Model for Cast Aluminum Alloys:** *Chang-Kai Wu*<sup>1</sup>; Makhlof Makhlof<sup>1</sup>; <sup>1</sup>Worcester Polytechnic Institute

11:00 AM

**Microstructures Design in Three-Component Alloys:** *Vasily Lutsyk*<sup>1</sup>; Edward Nasrulin<sup>2</sup>; <sup>1</sup>Institute of Physical Materials Science; <sup>2</sup>Buryat State University

11:20 AM

**Parts Heat Treatment Temperature Monitoring System Using C# Language:** *tian weiwei*<sup>1</sup>; cao wenzhong<sup>2</sup>; <sup>1</sup>Environmental & Chemical Engineering College of Nanchang University; <sup>2</sup>Environmental & Chemical Engineering College of Nanchang University

## Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches -- Fundamental and Engineering Issues: Complex Interfaces

*Program Organizers:* Wayne Kaplan, Technion - Israel Institute of Technology; Paul Wynblatt, Carnegie Mellon University; Dominique Chatain, Centre Interdisciplinaire de Nanoscience de Marseille; Mikel Holcomb, West Virginia University

Thursday AM  
October 20, 2011

Room: C120  
Location: Columbus Con. Center

*Session Chairs:* Dominique Chatain, CNRS; Wayne Kaplan, Technion - Israel Institute of Technology

8:00 AM Keynote

**Atomic Scale Analysis of Nanostructures and Interfaces in Photovoltaic Devices:** *Christina Scheu*<sup>1</sup>; Andreas Wisnet<sup>1</sup>; Markus Thomann<sup>1</sup>; Jonas Weickert<sup>1</sup>; Kevin Musselman<sup>2</sup>; Judith MacManus-Driscoll<sup>2</sup>; Lukas Schmidt-Mende<sup>1</sup>; <sup>1</sup>Ludwig-Maximilians-University of Munich; <sup>2</sup>University of Cambridge

8:40 AM Invited

**Effect of Composition and Thickness on the Atomistic Structure of Rare-Earth Doped Intergranular Films in Silicon Nitride:** *Stephen Garofalini*<sup>1</sup>; Yun Jiang<sup>1</sup>; <sup>1</sup>Rutgers University

9:00 AM Invited

**Uncovering Complexions - The Phase Behavior of Interfaces:** *Martin Harmer*<sup>1</sup>; <sup>1</sup>Lehigh University

9:20 AM Invited

**The Unrecognized Role of Grain Boundary "Complexion" in Embrittlement:** *Jian Luo*<sup>1</sup>; Huikai Cheng<sup>2</sup>; Kaveh Meshinchi Asl<sup>1</sup>; Christopher Kiely<sup>3</sup>; Martin Harmer<sup>3</sup>; <sup>1</sup>Clemson University; <sup>2</sup>FEI Company; <sup>3</sup>Lehigh University

9:40 AM Break

10:00 AM Invited

**Long Range Interactions and Electrodynamics of Nanoscale Assembly: Carbon Nanotubes:** *Roger French*<sup>1</sup>; <sup>1</sup>Case Western Reserve University

10:20 AM

**A Generalized Framework for Quantifying Grain Boundary Structure-Property Relationships at the Nanoscale:** *Mark Tschopp*<sup>1</sup>; Kiran Solanki<sup>1</sup>; Mark Horstemeyer<sup>1</sup>; <sup>1</sup>Mississippi State University

10:40 AM

**Au/TiO<sub>2</sub> Interfacial Reconstruction Stability from Ab Initio:** *Dallas Trinkle*<sup>1</sup>; Min Yu<sup>1</sup>; <sup>1</sup>University of Illinois, Urbana-Champaign

11:00 AM

**Direct Imaging of Ordered Defect Superstructures at Grain Boundaries:** *Zhongchang Wang*<sup>1</sup>; M. Saito<sup>1</sup>; K. McKenna<sup>1</sup>; L. Gu<sup>1</sup>; S. Tsukimoto<sup>1</sup>; A. Shluger<sup>1</sup>; Y. Ikuhara<sup>1</sup>; <sup>1</sup>WPI-AIMR, Tohoku Univ.

11:20 AM

**Geometrical Construction of 90° v S Quasi-Periodic Grain Boundaries in Cubic Materials:** *Mohammad Shamsuzzoha*<sup>1</sup>; <sup>1</sup>University of Alabama

11:40 AM

**High Resolution TEM and Atomistic Simulations of Al<sub>3</sub>Mg<sub>2</sub> - Al Interfaces in Al-Mg Alloy:** *Ronald Holtz*<sup>1</sup>; Noam Bernstein<sup>1</sup>; Ramasis Goswami<sup>2</sup>; <sup>1</sup>Naval Research Laboratory; <sup>2</sup>SAIC



## International Symposium on Advances in Nanostructured Materials and Applications: The 2011 Acta Materialia Gold Medal Symposium: Nanoscale Characterizations and Carbon Related Nanomaterials

*Program Organizers:* Haiyan Wang, Texas A&M University; Nuggehalli Ravindra, New Jersey Institute of Technology; Alan Ardell, National Science Foundation; Yuntian Zhu, North Carolina State University; Xinghang Zhang, Texas A&M University; Rajiv K. Singh, University of Florida; John Prater, Army Research Office

Thursday AM  
October 20, 2011  
Room: E170  
Location: Columbus Con. Center

*Session Chairs:* Ashutosh Tiwari, University of Utah; Haiyan Wang, Texas A&M University

### 8:00 AM Invited

**Self-Assembled Nanostructures in Mixed III-V and Group III Nitrides Epitaxial Layers and Their Influence on Devices:** *Subhash Mahajan*<sup>1</sup>; <sup>1</sup>Arizona State University

### 8:20 AM Invited

**In Situ Observation on Dislocation Dynamics in Nanocrystalline and Nanosized Metals:** *Scott Mao*<sup>1</sup>; <sup>1</sup>University of Pittsburgh

### 8:40 AM

**Direct Observation of Deformation Behavior in Ceramic Nanocomposites and Nanolayers via In Situ TEM Nanoindentation Study:** *Joon Hwan Lee*<sup>1</sup>; *Ickchan Kim*<sup>1</sup>; *Amiya Mukherjee*<sup>2</sup>; *Xinghang Zhang*<sup>1</sup>; *Haiyan Wang*<sup>1</sup>; <sup>1</sup>Texas A&M University; <sup>2</sup>University of California, Davis

### 9:00 AM

**Probing Magnetic Structure of Ni Nanocubes Using Multi-Frequency Electron Magnetic Resonance Spectroscopy:** *Saritha Nellutla*<sup>1</sup>; *Sudhakar Nori*<sup>1</sup>; *J. Narayan*<sup>1</sup>; *J. T. Prater*<sup>2</sup>; *Alex Smirnov*<sup>1</sup>; <sup>1</sup>North Carolina State University; <sup>2</sup>Army Research Office

### 9:20 AM Break

### 9:40 AM

**Deterministic Approach to Magnetic Field Assisted Assembly Using Programmable Magnets:** *Vijay Kasisomayajula*<sup>1</sup>; *Rene Rivero*<sup>1</sup>; *Anthony T. Fiory*<sup>1</sup>; *Michael Booty*<sup>1</sup>; *N. M. Ravindra*<sup>1</sup>; <sup>1</sup>New Jersey Institute of Technology

### 10:00 AM Invited

**Imaging and Spectroscopy of Chemical and Structural Defects in Graphene:** *Matthew Chisholm*<sup>1</sup>; *Gerd Duscher*<sup>2</sup>; *Wolfgang Windl*<sup>3</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>University of Tennessee; <sup>3</sup>The Ohio State University

### 10:20 AM Invited

**Nanomaterials in the C-B-N System:** *Raj Singh*<sup>1</sup>; <sup>1</sup>University of Cincinnati

### 10:40 AM Invited

**Micro-and Nanoscale Applications of Nanocrystalline Diamond Films:** *Ashok Kumar*<sup>1</sup>; <sup>1</sup>University of South Florida

### 11:00 AM Invited

**Fracture of Nanostructure Sn/C Anodes:** *Katerina Aifantis*<sup>1</sup>; <sup>1</sup>Aristotle University

### 11:20 AM

**Nanostructured Metal Containing Diamond-Like Carbon Films:** *Varshni Singh*<sup>1</sup>; *Yaroslav Losovyj*<sup>1</sup>; <sup>1</sup>Louisiana State University

### 11:40 AM

**An Ionic-Liquid-Functionalized MWNT/Epoxy Composite:** *zhe wang*<sup>1</sup>; *Tomas Hahn*<sup>1</sup>; *Hansang Kim*<sup>1</sup>; <sup>1</sup>UCLA

## International Symposium on Defects, Transport and Related Phenomena: Defects and Transport in Materials Related to Fuel Cells II

*Program Organizers:* Sangtae Kim, University of California, Davis; Ruediger Dieckmann, Cornell University; Doreen Edwards, Alfred University; Manfred Martin, RWTH Aachen University; Thomas Mason, Northwestern University

Thursday AM  
October 20, 2011  
Room: C122  
Location: Columbus Con. Center

*Funding support provided by:* WCU Hybrid Materials Program, Department of Materials Science and Engineering, Seoul National University, Korea

*Session Chairs:* Sangtae Kim, UC Davis; Igor Lubomirsky, Weizmann Institute of Science

### 8:00 AM Invited

**Surface Electrochemistry in Ceria-Based Electrodes Elucidated:** *William Chueh*<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

### 8:40 AM

**DC-Bias Dependence of Proton Transport across the Grain Boundaries in Aliovalent Doped Perovskite Zirconates:** *Chien-Ting Chen*<sup>1</sup>; *Fumitada Iguchi*<sup>2</sup>; *Hiroo Yugami*<sup>2</sup>; *Sangtae Kim*<sup>1</sup>; <sup>1</sup>University of California, Davis; <sup>2</sup>Tohoku University

### 9:00 AM Invited

**Influence of In-Plane Strain on the Magnitude of the Electromechanical Effects in Gd-Doped Ceria:** *Igor Lubomirsky*<sup>1</sup>; *Roman Korobko*<sup>1</sup>; <sup>1</sup>Weizmann Institute of Science

### 9:40 AM Break

### 10:00 AM Invited

**The Role of Temperature, Partial Oxygen Pressure and Electrochemical Polarization on Charge Transport in Thin Film Solid Oxide Fuel Cell Cathodes:** *Brian Ingram*<sup>1</sup>; *Timothy Fister*<sup>1</sup>; *Seongkeun Kim*<sup>1</sup>; *Jeffrey Eastman*<sup>1</sup>; *Matthew Highland*<sup>1</sup>; *Paul Fuoss*<sup>1</sup>; <sup>1</sup>Argonne National Laboratory

### 10:40 AM

**Molecular Dynamics Simulation and Image Simulation of the Locations La Ions in Silicon Nitride Crystal Growth:** *YUN JIANG*<sup>1</sup>; *Stephen Garofalini*<sup>1</sup>; <sup>1</sup>Rutgers University

## Joining of Advanced and Specialty Materials (JASM XIII): Welding Technologies and Applications

*Program Organizers:* Judith Schneider, Mississippi State University; Norman Zhou, Univ. of Waterloo; Leijun Li, Utah State University; Mathieu Brochu, McGill University; Boian Alexandrov, The Ohio State University; Michael Halbig, U.S. Army Research Laboratory; Akio Hirose, Osaka University; Sammy Tin, Illinois Institute of Technology

Thursday AM  
October 20, 2011  
Room: E161B  
Location: Columbus Con. Center

*Session Chairs:* Judy Schneider, Mississippi State University; Mike Halbig, NASA Glenn Research Center

### 8:00 AM Invited

**Overview of Recent Developments in Laser Welding:** *Rosa Miranda*<sup>1</sup>; <sup>1</sup>FCT-UNL

8:20 AM

**Effects of Welding Positions on Droplet Transfer in CO<sub>2</sub> Laser-MAG Hybrid Welding:** Jiecai Feng<sup>1</sup>; Liqun Li<sup>1</sup>; Chunjin Hang<sup>1</sup>; Yanbin Chen<sup>1</sup>; Hao Qi<sup>1</sup>; <sup>1</sup>State Key Laboratory of Advanced Welding and Joining, Harbin Institute of Technology.

8:40 AM

**Prediction of Concentration Profiles in a Diffusion Joint:** Esfakur Rahman<sup>1</sup>; Matthew Cavalli<sup>1</sup>; <sup>1</sup>University of North Dakota

9:00 AM

**Proper Welding Procedure to Sleeve Repair Internally Coated Fusion Bonded Epoxy (FBE) Water Lines:** TARIQ ALGHAMDI<sup>1</sup>; Faisal Al-Abbas<sup>1</sup>; Yagoub Al-Nassar<sup>2</sup>; <sup>1</sup>Saudi Aramco; <sup>2</sup>King Fahd University of Petroleum and Minerals

9:20 AM

**Use of Scrap Tire Derived Geomaterials in the Geotechnical Construction:** pranjal barman<sup>1</sup>; <sup>1</sup>Indian Institute of Technology, Guwahati

9:40 AM Break

10:00 AM Invited

**A Manufacturing Strategy for the Assembly of Bi-Metallic Honeycomb Based Hybrid Materials Systems:** Jerry Gould<sup>1</sup>; George Ritter<sup>1</sup>; <sup>1</sup>Edison Welding Institute

10:40 AM

**Formation Process of Intermetallic Compounds during Reactive TLP Bonding between Mg Alloy and Steel:** Masaki Koba<sup>1</sup>; Toshio Araki<sup>1</sup>; Shoichi Nambu<sup>1</sup>; Junya Inoue<sup>1</sup>; Toshihiko Koseki<sup>1</sup>; <sup>1</sup>The University of Tokyo

11:00 AM

**Reactivity of the faying Surface in Al-Mg<sub>2</sub>Si Metal Matrix Composite/Magnesium Alloy Bonds:** Mehdi Mazar Atabaki<sup>1</sup>; Andrew Mullis<sup>1</sup>; <sup>1</sup>the Leeds University

11:20 AM

**A Characteristic of HAZ of Mg Rolled Sheet on TIG Welding:** Mokyoun Lee<sup>1</sup>; Norman Zhou<sup>2</sup>; <sup>1</sup>RIST; <sup>2</sup>University of Waterloo

11:40 AM

**Geometrical Modulations of Alloy Phases in Steel Microstructures by Using Spatial Welding:** Soshu Kiriha<sup>1</sup>; Satoko Tasaki<sup>1</sup>; Yasunori Uehara<sup>1</sup>; Yousuke Itakura<sup>1</sup>; <sup>1</sup>Osaka University

## Materials for Nuclear Waste Disposal and Environmental Cleanup: Materials and Processes for Nuclear Materials Storage and Handling

*Program Organizer:* Elizabeth Hoffman, Savannah River National Laboratory

Thursday AM  
October 20, 2011

Room: C226  
Location: Columbus Con. Center

*Session Chair:* Raul Rebak, GE Global Research

8:00 AM

**Secure and Certify Studies to Work on Production of Spiked Plutonium:** Ashraf Mohamed<sup>1</sup>; <sup>1</sup>BRNO University

8:20 AM

**Oxygen Consumption Analysis for Life Prediction of Elastomers:** Elizabeth Hoffman<sup>1</sup>; T. Skidmore<sup>1</sup>; Donald Fisher<sup>1</sup>; William Daugherty<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

8:40 AM

**Ground Water Inhibitors of Localized Corrosion in Passivating Alloys:** Martin Rodriguez<sup>1</sup>; Ricardo Carranza<sup>1</sup>; Raul Rebak<sup>2</sup>; <sup>1</sup>Atomic Energy Commission of Argentina; <sup>2</sup>GE Global Research

9:00 AM

**Effect of Coprecipitation on Batch Melting: Crucible Study:** Pavel Hrma<sup>1</sup>; Jose Marcial<sup>1</sup>; Samuel Henager<sup>1</sup>; Jarrett Rice<sup>1</sup>; <sup>1</sup>Pacific Northwest National Laboratory

9:20 AM

**Radiation Shielding Simulation for Wollastonite-Based Chemically Bonded Phosphate Ceramics:** Jason Pleitt<sup>1</sup>; H. A. Colorado<sup>2</sup>; Carlos H Castano<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology; <sup>2</sup>University of California, Los Angeles

9:40 AM Break

10:00 AM

**Influence of Cation Composition and Temperature on the Solubility and Oxidation State of Ce in Apatite Silicates:** Peter Slater<sup>1</sup>; <sup>1</sup>University of Birmingham

10:20 AM Cancelled

**Sequestration of Technology Enhanced Naturally Occurring Nuclear Materials (TENORMs) from Drilling of Oil and Gas Wells:** John R. Hellmann<sup>1</sup>; Barry E. Scheetz<sup>2</sup>; Paul C. Painter<sup>1</sup>; Bruce G. Miller<sup>1</sup>; Ryan Koseski<sup>1</sup>; Aron Lupinsky<sup>1</sup>; <sup>1</sup>The Pennsylvania State University

## Materials Science Challenges for Nuclear Applications: High Temperature Materials

*Program Organizers:* Ram Devanathan, Pacific Northwest National Laboratory; Raul Rebak, GE Global Research; Kevin Fox, Savannah River National Laboratory; Andrzej Wojcieszynski, ATI Powder Metals; Ramprasad Prabhakaran, Idaho National Laboratory; Bill Lee, Imperial College London; Kumar Sridharan, University of Wisconsin; Elizabeth Hoffman, Savannah River National Laboratory; David Forrest, Naval Surface Warfare Center; Aladar Csontos, U.S. Nuclear Regulatory Commission

Thursday AM  
October 20, 2011

Room: C225  
Location: Columbus Con. Center

*Session Chair:* Kumar Sridharan, University of Wisconsin

8:00 AM

**Grain Size Dependence of Radiation Response in Silicon Carbide:** Laura Jamison<sup>1</sup>; Peng Xu<sup>1</sup>; Kumar Sridharan<sup>1</sup>; Todd Allen<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

8:20 AM

**Ab-Initio Assisted Study of Irradiation Effects on Electronic Properties of 4H-SiC:** Ashutosh Kumar<sup>1</sup>; Oscar Restrepo<sup>1</sup>; Wolfgang Windl<sup>1</sup>; <sup>1</sup>The Ohio State University

8:40 AM

**Characterization of High Temperature Fracture Strength of CVD-SiC Coating Layer for Nuclear Fuel Particle by Micro Tensile Test:** Hyun Min Lee<sup>1</sup>; Kwi-Il Park<sup>1</sup>; Do Kyung Kim<sup>1</sup>; <sup>1</sup>Korea Advanced Institute of Science and Technology

9:00 AM

**The Effect of Deposition Parameters on the Properties of PyC and SiC Layer in TRISO-Coated UO<sub>2</sub> Kernel:** Yeon ku Kim<sup>1</sup>; Weon Ju Kim<sup>1</sup>; Ji Yeon Park<sup>1</sup>; Moon Sung Cho<sup>1</sup>; <sup>1</sup>Korea Atomic Energy Research Institute

## Measurements and Modeling of Advanced Automotive and Structural Materials at Intermediate and High Strain Rates: Intermediate-to-High-Rate Measurement Techniques

*Program Organizer:* Steven P. Mates, National Institute of Standards and Technology

Thursday AM  
October 20, 2011  
Room: D231  
Location: Columbus Con. Center

*Session Chair:* Bo Song, Sandia National Laboratories

### 8:00 AM Invited

**Compressive Response of Materials at Intermediate and High Rates:** *Weinong Chen*<sup>1</sup>; <sup>1</sup>Purdue University

### 8:40 AM Invited

**High Strain Rate Characterization of Magnesium Alloys:** *Yanli Wang*<sup>1</sup>; *Donald Erdman*<sup>1</sup>; *Vlastimil Kunc*<sup>1</sup>; *J. Michael Starbuck*<sup>1</sup>; *Srdjan Simunovic*<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory

### 9:20 AM

**Intermediate Strain Rate Testing for Single and Multiple Loading Sequence Testing on Bulk Materials:** *John Lewandowski*<sup>1</sup>; <sup>1</sup>Case Western Reserve Univ

### 9:40 AM Break

**10:00 AM Invited Deformation Measurement of Materials with Digital Image Correlation: From Quasi-Static to High Strain Rates:** *Louis Hector Jr.*<sup>1</sup>; <sup>1</sup>GM R&D Center

### 10:40 AM Invited

**Practical Issues Related to Generating Intermediate and High Rate Data for Advanced Automotive and Structural Materials:** *Susan Hill*<sup>1</sup>; <sup>1</sup>U of Dayton Research Institute

### 11:20 AM

**Efficient Energy Absorbing Element for Crashworthiness Applications in Quasi Static and Impact Loading:** *R Muralikannan*<sup>1</sup>; *Somaiah Gowthama*<sup>1</sup>; *Ramachandran Velmurugan*<sup>1</sup>; <sup>1</sup>Indian Institute of Technology Madras

### 11:40 AM

**Fully Instrumented Ring Expansion - A Method for Determining Constituent Materials Properties:** *Geoffrey Taber*<sup>1</sup>; <sup>1</sup>Ohio State University

## Microwave Processing of Materials: Session II

*Program Organizers:* Morsi Mahmoud, Karlsruhe Institute of Technology (KIT); Guido Link, Karlsruhe Institute of Technology

Thursday AM  
October 20, 2011  
Room: C221  
Location: Columbus Con. Center

*Session Chair:* Guido Link, Karlsruhe Institute of Technology

### 8:00 AM

**Microwave Plasma Deposition of Multilayered Nanocrystalline and Microcrystalline Diamond Thin Films for Thermal Management Applications:** *Nirmal Govindaraju*<sup>1</sup>; *Chaitanya Kane*<sup>1</sup>; *Raj Singh*<sup>1</sup>; <sup>1</sup>University of Cincinnati

### 8:20 AM

**Comparative Study of Microwave Welded and TIG Welded Stainless Steel (SS-316) Joints:** *M Srinath*<sup>1</sup>; *Apurbba Sharma*<sup>1</sup>; *Pradeep Kumar*<sup>1</sup>; <sup>1</sup>IIT Roorkee

### 8:40 AM

**Microwave Assist Sintering of Complex-Shape Titanium Powder Compacts:** *Morgana Fall*<sup>1</sup>; *Shawn Allan*<sup>1</sup>; *Holly Shulman*<sup>1</sup>; *Richard Everett*<sup>2</sup>; *M. Ashraf Imam*<sup>2</sup>; *Arne Fliflet*<sup>2</sup>; <sup>1</sup>Ceralink Inc; <sup>2</sup>Naval Research Laboratories

### 9:00 AM

**Roles of Electromagnetic Fields on Materials Processing and Performance -- A Thermodynamic and Kinetic Perspective:** *Boon Wong*<sup>1</sup>; <sup>1</sup>L-3 Communications

### 9:20 AM

**Modeling Non-Thermal Microwave Effects:** *Juliana Mortenson*<sup>1</sup>; <sup>1</sup>General Resonance, LLC

### 9:40 AM Break

### 10:00 AM

**On the Interrelationship of Applied Fields and Heating Rates during Electric Field Sintering of Ionic Ceramics:** *Troy Holland*<sup>1</sup>; *Sebastian Schwarz*<sup>2</sup>; *Dat Quach*<sup>1</sup>; *Umberto Anselmi-Tamburini*<sup>3</sup>; *Tien Tran*<sup>1</sup>; *Klaus van Benthem*<sup>1</sup>; *Amiya Mukherjee*<sup>1</sup>; <sup>1</sup>University of California, Davis; <sup>2</sup>Darmstadt University of Technology; <sup>3</sup>University of Pavia

### 10:20 AM

**Microwave Sintering of Mullite and the Effect of La2O3 as Aid:** *Pollyane Souto*<sup>1</sup>; *Romualdo Menezes*<sup>2</sup>; *Ruth Kiminami*<sup>1</sup>; <sup>1</sup>Universidade Federal de São Carlos; <sup>2</sup>Federal University of Paraíba

### 10:40 AM

**Millimeter-Wave Sintering of Laser Oxide Ceramics:** *Yury Bykov*<sup>1</sup>; *Sergei Egorov*<sup>1</sup>; *Anatoly Ereemeev*<sup>1</sup>; *Vladislav Kholoptsev*<sup>1</sup>; *Oleg Ereimeikin*<sup>1</sup>; *Stanislav Balabanov*<sup>2</sup>; *Viktor Drobotenko*<sup>2</sup>; *Evgeny Gavrischuk*<sup>2</sup>; *Alexander Egorov*<sup>3</sup>; *Alexander Savikin*<sup>3</sup>; *Valery Sharkov*<sup>3</sup>; <sup>1</sup>Institute of Applied Physics, Russian Academy of Sciences; <sup>2</sup>Institute of Chemistry of High-Purity Substances, Russian Academy of Sciences; <sup>3</sup>Nizhny Novgorod State University

### 11:00 AM

**High Frequency Microwave Processing of Lithium Disilicate Glass-Ceramic:** *Morsi Mahmoud*<sup>1</sup>; *Guido Link*<sup>1</sup>; *Simone Miksch*<sup>1</sup>; *Manfred Thumm*<sup>1</sup>; <sup>1</sup>Karlsruhe Institute of Technology (KIT)

## Nanotechnology for Energy, Healthcare and Industry: Session III

*Program Organizers:* Gary Pickrell, Virginia Tech; Suveen Mathaudhu, U.S. Army Research Office; Wolfgang Sigmund, University of Florida; Jud Ready, Georgia Tech; George Wei, Osram Sylvania; Ke Wang, Virginia Tech; Zhiwei Shan, Jiaotong University; Alpesh Shukla, Lawrence Berkeley National Laboratory; Nitin Chopra, The University of Alabama; Sudipta Seal, Univ of Central Florida; Navin Manjorran, Siemens Corporation; Julia Greer, California Institute of Technology

Thursday AM  
October 20, 2011  
Room: C125  
Location: Columbus Con. Center

*Session Chairs:* Bassam Alfeeli, Kuwait Institute for Scientific Research; Gary Pickrell, Virginia Tech

### 8:00 AM

**Migration of Nanotechnology from Laboratory to Market Place:** *Arci Experience:* *Sundararajan G*<sup>1</sup>; <sup>1</sup>ARCI

8:40 AM

**Influence of Substrate Temperature and RF Power on the Formation of ZnO Nanorods for Solar Driven Hydrogen Production:** *Sudhakar Shet<sup>1</sup>; Heli Wang<sup>1</sup>; Yanfa Yan<sup>1</sup>; Ravindra Nuggehalli<sup>2</sup>; John Turner<sup>1</sup>; Mowafak Al-Jassim<sup>1</sup>*; <sup>1</sup>National Renewable Energy Laboratory; <sup>2</sup>New Jersey Institute of Technology

9:00 AM

**Nanoscale Hierarchical Reinforcement for Robust and Durable Composites:** *Anil Karumuri<sup>1</sup>; Sharmila Mukhopadhyay<sup>1</sup>*; <sup>1</sup>Wright State University

9:20 AM

**Optimization of Parameters for Synthesis of Cobalt Oxide Nanopowders by Gel Combustion Method:** *Arman Sedghi<sup>1</sup>; Nastaran noori<sup>2</sup>; Armita Shahbazkhan<sup>3</sup>*; <sup>1</sup>Imam Khomeini International University; <sup>2</sup>Niroo Research Institute; <sup>3</sup>Islamic Azad University-saveh Unit

9:40 AM Break

10:00 AM

**Porous Material Fabrication Using Ice Particles as a Pore Forming Agent:** *Samantha Smith<sup>1</sup>; Gary Pickrell<sup>1</sup>*; <sup>1</sup>Virginia Tech

10:20 AM

**Enhanced Mechanical and Dielectric Properties of Polyurethane/Polysulfone /Multi-Walled Carbon Nanotube Hybrid Nanocomposites:** *Mulayam Gaur<sup>1</sup>; Rekha Singh<sup>1</sup>*; <sup>1</sup>Hindustan College of Science and Technology

10:40 AM

**Effect of Surface Nanocrystallization of a Precipitation Hardened Stainless Steel on Corrosion and Environmental Cracking:** *Indranil Roy<sup>1</sup>; John Meng<sup>2</sup>; Brian Chambers<sup>2</sup>; Colin Longfield<sup>1</sup>; Rashmi Bhavsar<sup>1</sup>; Yuntian Zhu<sup>3</sup>; Farghalli Mohamed<sup>4</sup>*; <sup>1</sup>Schlumberger; <sup>2</sup>Honeywell Corrosion Solutions; <sup>3</sup>North Carolina State University; <sup>4</sup>University of California

11:00 AM Cancelled

**The Nanotechnology Applied in the Companies: The Cosmetics Industry Case:** *Marcio Canavez<sup>1</sup>; Walter Shima<sup>1</sup>*; <sup>1</sup>UFPR

## Next Generation Biomaterials: Biomaterials Science and Technology

**Program Organizers:** Roger Narayan, Univ of North Carolina & North Carolina State Univ; Kalpana Katti, North Dakota State University; Kajal Mallick, University of Warwick; Vilupanur Ravi, California State Polytechnic University, Pomona; Varshni Singh, Louisiana State University

Thursday AM  
October 20, 2011

Room: C215  
Location: Columbus Con. Center

**Session Chairs:** Rizhi Wang, University of British Columbia ; Mitsuo Niinomi, Tohoku University

8:00 AM

**Comparison of Microstructures and Mechanical Properties for CoCrMo Biomedical Implant Prototypes Fabricated by EBM and Failed Implants by Traditional Manufacturing:** *Sara Gaytan<sup>1</sup>; L. Murr<sup>1</sup>; E. Martinez<sup>1</sup>; F. Medina<sup>1</sup>; S. Stafford<sup>1</sup>; U. Ackelid<sup>2</sup>; R. Wicker<sup>1</sup>*; <sup>1</sup>UTEP; <sup>2</sup>Arcam AB

8:20 AM Invited

**Electrically Triggered Drug Delivery Using Nanoporous Electrodes:** *David Robinson<sup>1</sup>; Shaun Gittard<sup>2</sup>; Chung-An Wu<sup>1</sup>; Roger Narayan<sup>2</sup>*; <sup>1</sup>Sandia National Laboratories; <sup>2</sup>North Carolina State University

8:40 AM Invited

**Diode Laser Surface Treated Commercially Pure Titanium: Corrosion and Wear Investigation:** *Samar Kalita<sup>1</sup>; Joshua Johnson<sup>1</sup>; Benjamin Waldera<sup>1</sup>*; <sup>1</sup>Advanced Engineered Materials Center, University of North Dakota

9:00 AM

**Hydrolysis of Monetite/Chitosan Composites in Alpha-MEM & SBF Solutions:** *Ahmed Touny<sup>1</sup>; Herbert Dawkins<sup>2</sup>; Huan Zhou<sup>2</sup>; Sarit Bhaduri<sup>2</sup>*; <sup>1</sup>Helwan University; <sup>2</sup>University of toledo

9:20 AM Invited

**Local Drug Delivery Techniques for the Prevention of Implant-Associated Infections:** *Rizhi Wang<sup>1</sup>; Mehdi Mehdi Kazemzadeh-Narbat<sup>1</sup>; Menghan Ma<sup>1</sup>; Robert Hancock<sup>1</sup>*; <sup>1</sup>University of British Columbia

9:40 AM Break

10:00 AM

**Third Body Challenges in Total Hip Arthroplasty:** *Nishant Tikekar<sup>1</sup>; Anneliese Heiner<sup>2</sup>; Matt Beal<sup>1</sup>; Thomas Brown<sup>2</sup>; John Lannutti<sup>1</sup>*; <sup>1</sup>The Ohio State University; <sup>2</sup>The University of Iowa

10:20 AM Invited

**Young's Modulus Changeable Biomedical Titanium Alloy for Preventing Stress Shielding and Spring-Back:** *Mitsuo Niinomi<sup>1</sup>; Masaaki Nakai<sup>1</sup>*; <sup>1</sup>Tohoku University

10:40 AM

**Magnesium-Titanium Alloys for Biodegradable Implants:** *Ilona Hoffmann<sup>1</sup>; David Puleo<sup>1</sup>; Yang-Tse Cheng<sup>1</sup>*; <sup>1</sup>University of Kentucky

11:00 AM

**In-Vitro and In-Vivo Osteocompatibility Assessment for Carbon Nanotube Reinforced Hydroxyapatite Coatings:** *Debrupa Lahiri<sup>1</sup>; Ana Paula Benaduce<sup>1</sup>; Sybille Facca<sup>2</sup>; Lidia Kos<sup>1</sup>; Nadia Benkirane-Jessel<sup>2</sup>; Arvind Agarwal<sup>1</sup>*; <sup>1</sup>Florida International University; <sup>2</sup>Institut National de la Santé et de la Recherche Médicale (INSERM)

11:20 AM

**The Effects of Sn Addition on Mechanical Behavior of Ti-24Nb-4Zr-3Mo (8-12) Sn Alloys:** *Paul nnamchi<sup>1</sup>*; <sup>1</sup>University of sheffield

11:40 AM

**Use of Pore Structure to Manipulate the High Temperature Decomposition of Hydroxyapatite:** *Anthony Finoli<sup>1</sup>; Jorg Gerlach<sup>2</sup>; Ian Nettleship<sup>1</sup>*; <sup>1</sup>University of Pittsburgh; <sup>2</sup>McGowan Institute for Regenerative Medicine

## Periodic Cellular Materials: Current Status and Recent Progress: Lattice Truss Structures

**Program Organizer:** David Alexander, Los Alamos National Laboratory

Thursday AM  
October 20, 2011

Room: D233  
Location: Columbus Con. Center

**Session Chair:** David Alexander, Los Alamos National Laboratory

8:00 AM Invited

**Periodic Cellular Structures for Mitigating Dynamic Loading Events:** *Douglas Queheillalt<sup>1</sup>*; <sup>1</sup>Cellular Materials International

8:40 AM Invited

**Mechanical Properties of Cast Ti-64 and Ti-6242 Lattice Block Structures:** *Qizhen Li<sup>1</sup>; Edward Chen<sup>2</sup>; Douglas Bice<sup>2</sup>; David Dunand<sup>3</sup>*; <sup>1</sup>University of Nevada, Reno; <sup>2</sup>Transition45 Technologies; <sup>3</sup>Northwestern University



**9:00 AM Invited**

**Nanocrystalline Metal-Metal Microtruss Hybrids:** *Glenn Hibbard*<sup>1</sup>;  
<sup>1</sup>University of Toronto

**9:40 AM Break**

**10:00 AM Invited**

**Multi-Scale Characterization of Nickel Micro-Lattices under Compressive Loads:** *Lorenzo Valdevit*<sup>1</sup>; Anna Torrents<sup>1</sup>; Scott Godfrey<sup>1</sup>; Jie Lian<sup>2</sup>; Julia Greer<sup>2</sup>; Tobias Schaedler<sup>3</sup>; Alan Jacobsen<sup>3</sup>; William Carter<sup>3</sup>; <sup>1</sup>University of California, Irvine; <sup>2</sup>California Institute of Technology; <sup>3</sup>HRL Laboratories

**10:40 AM**

**Architectural Design and Performance of a Truss Lattice Structure:** *Chris Hammett*<sup>1</sup>; Renaud Rinaldi<sup>1</sup>; Alan Jacobsen<sup>2</sup>; Frank Zok<sup>1</sup>; <sup>1</sup>University of California at Santa Barbara; <sup>2</sup>HRL Laboratories, LLC

**11:00 AM**

**Tailored Periodic Cellular Materials and Structures Fabricated from Interlocking Slotted Strips:** *David Alexander*<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

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**Processing, Microstructure and Properties of Cast Irons and Cast and Forged Specialty Steels: Cast Irons**

*Program Organizers:* Srinath Viswanathan, University of Alabama; Stephanie Will, The Timken Company

Thursday AM  
October 20, 2011

Room: D142/143  
Location: Columbus Con. Center

*Session Chair:* Stephanie Will, The Timken Company

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**8:00 AM**

**A Study on the Casting Process Design of the Ductile Cast Iron Cylinder Head for Marine Diesel Engine:** *TAE-DONG PARK*<sup>1</sup>; SUNG-MO LEE<sup>1</sup>; JONG-MIN PARK<sup>1</sup>; DAE-YOUNG KIM<sup>1</sup>; <sup>1</sup>HYUNDAI HEAVY INDUSTRIES CO., LTD

**8:20 AM**

**Heavy Section Ductile Iron Castings for Use in Wind Turbine Generators:** *Meghan Haycock*<sup>1</sup>; Paul Sanders<sup>1</sup>; Pat Quimby<sup>1</sup>; <sup>1</sup>Michigan Technological University

**8:40 AM**

**Fracture and Fatigue Behavior of Austempered Malleable Irons:** *Kei-Peng Jen*<sup>1</sup>; Sanket Deshmukh<sup>1</sup>; <sup>1</sup>Villanova University

**9:00 AM**

**Challenges of Accurate Fatigue Analysis of Cast Iron Components Due to Non Homogenous Microstructure:** *Andre Heinrietz*<sup>1</sup>; Jens Eufinger<sup>1</sup>; Thomas Bruder<sup>1</sup>; Holger Hanselka<sup>1</sup>; <sup>1</sup>Fraunhofer Institute of Structural Durability and System Reliability LBF

**9:20 AM**

**Corrosion Behaviour of a Newly Developed 10mn-7cr-5cu Alloy White Iron in Marine Atmosphere:** *Anil Bhargava*<sup>1</sup>; Chetanya Sharma<sup>1</sup>; <sup>1</sup>Malaviya National Institute of Technology

**9:40 AM Break**

**10:00 AM**

**Influence of Boron on the Matrix of Spheroidal Graphite Cast Iron and Its Counteraction Method:** *Ying Zou*<sup>1</sup>; Motoharu Ogawa<sup>1</sup>; Hideo Nakae<sup>1</sup>; <sup>1</sup>Waseda University

**10:20 AM**

**Lubricated Reciprocating Frictional Properties of Marine Cylinder Liner Materials in Boundary and Mixed Lubrication:** *Toku Itoh*<sup>1</sup>; <sup>1</sup>Oita Technical College

**10:40 AM**

**Wear Behavior of Cu Alloyed Austempered Ductile Iron:** *Uma Batra*<sup>1</sup>; J D Sharma<sup>1</sup>; Nimish Batra<sup>2</sup>; <sup>1</sup>PEC Univ. of Technology; <sup>2</sup>Thapar University of Technology

**11:00 AM**

**Niobium Alloying in Grey Cast Iron for Vehicle Brake Discs:** *Hardy Mohrbacher*<sup>1</sup>; Qijie Zhai<sup>2</sup>; <sup>1</sup>NiobelCon bvba; <sup>2</sup>Shanghai University

**11:20 AM**

**Abrasion Wear Behaviors of Conventional and Two-Step Austempered Ductile Irons:** Prapaporn Silawong<sup>1</sup>; Apichart Panichkul<sup>1</sup>; Sudsakorn Inthidech<sup>2</sup>; Narong Akkarapattanaagoon<sup>1</sup>; *Usanee Kitkamthorn*<sup>1</sup>; <sup>1</sup>Suranaree University of Technology; <sup>2</sup>Maharakham University

**11:40 AM Cancelled**

**Application of SiMo Series of Ductile Iron Materials in Turbocharger and Heat Treatment Process Optimization:** *Li Xu*<sup>1</sup>; ShouXing Zhu<sup>1</sup>; <sup>1</sup>Honywell Integrated Technology(China) Co.,Ltd.

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**Professor K. K. Chawla Honorary Symposium on Fibers, Foams and Composites: Science and Engineering: Metal Matrix Composites/Ceramic Matrix Composites II**

*Program Organizers:* Nikhilesh Chawla, Arizona State University; Aldo Boccaccini, University of Erlangen-Nuremberg; Gary Gladysz, Trelleborg USA; Pedro D. Portella, Federal Institute of Testing and Materials BAM

Thursday AM  
October 20, 2011

Room: D234  
Location: Columbus Con. Center

*Session Chairs:* Nik Chawla, Arizona State University; Burton Patterson, University of Florida

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**8:00 AM Invited**

**Double Cemented Carbide-Dual Composite:** *Burton Patterson*<sup>1</sup>; Xin Deng<sup>2</sup>; Zak Fang<sup>3</sup>; <sup>1</sup>University of Florida; <sup>2</sup>Smith International; <sup>3</sup>University of Utah

**8:40 AM**

**Determination of Residual Stress in Functionally Graded WC-Co Cements:** *Leila Tahvilian*<sup>1</sup>; Zhigang Zak Fang<sup>1</sup>; K. S. Ravi Chandran<sup>1</sup>; <sup>1</sup>University of Utah

**9:00 AM**

**Hollow Sphere Reinforced Magnesium Alloy Matrix Composites:** *John DeFouw*<sup>1</sup>; Ben Schultz<sup>2</sup>; Nikhil Gupta<sup>3</sup>; Dung Luong<sup>3</sup>; Pradeep Rohatgi<sup>2</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>University of Wisconsin - Milwaukee; <sup>3</sup>Polytechnic Institute of New York University - Brooklyn

**9:20 AM**

**Microstructural and Mechanical Behavior of Al-Mg-Si Alloy Composite Reinforced with Carbon Nanotubes:** *Katsuyoshi Kondoh*<sup>1</sup>; Hiroyuki Fukuda<sup>1</sup>; Junko Umeda<sup>1</sup>; Bunshi Fugetsu<sup>2</sup>; <sup>1</sup>Osaka University; <sup>2</sup>Hokkaido University

**9:40 AM Break**

**10:00 AM**

**Compression-Compression Fatigue Investigation of a Pd43Ni10Cu27P20 Metallic-Glass Foam:** Gongyao Wang<sup>1</sup>; M. Demetriou<sup>1</sup>; J. Schramm<sup>1</sup>; *Peter Liaw*<sup>1</sup>; W Johnson<sup>1</sup>; <sup>1</sup>Univ of Tennessee



**10:20 AM Invited**

**High Temperature Stable Geopolymer Composites:** *Waltraud Kriven<sup>1</sup>; Timothy Dietz<sup>1</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign*

**11:00 AM Invited**

**Implementation Challenges for Sintered Silicon Carbide Fiber Bonded Ceramic Materials for High Temperature Applications:** *Mrityunjay Singh<sup>1</sup>; <sup>1</sup>Ohio Aerospace Institute, NASA Glenn Research Center*

**11:40 AM**

**Effect of Age-Hardening on Dry Sliding Wear Behaviour of Mushy State Rolled**

**In-Situ Al-4.5Cu-5TiB<sub>2</sub> Composite**

: *Krishnan Pavitra<sup>1</sup>; Rahul Mitra<sup>1</sup>; <sup>1</sup>Indian Institute of Technology*

## Recent Advances in Structural Characterization of Materials: Spectroscopic Methods

*Program Organizers:* Chad Parish, Oak Ridge National Laboratory; Roumiana Petrova, New Jersey Institute of Tech; Jacob Jones, University of Florida; Zhonghou Cai, Argonne National Laboratory; Gang Chen, Ohio University

Thursday AM

October 20, 2011

Room: C212

Location: Columbus Con. Center

*Session Chair:* Chad Parish, Oak Ridge National Labs

**8:00 AM Invited**

**X-Ray Transient Absorption Spectroscopy Studies on Interfacial Electron Transfer:** *xiaoyi zhang<sup>1</sup>; Grigory Smolentsev<sup>2</sup>; Sophie Canton<sup>2</sup>; Lin Chen<sup>1</sup>; <sup>1</sup>Argonne National Lab; <sup>2</sup>Department of Chemical Physics, Lund University*

**8:40 AM Invited**

**Structural Characterization of Materials Using Synchrotron Based X-Ray Absorption and Scattering Techniques:** *Qing Ma<sup>1</sup>; <sup>1</sup>DND-CAT/ Northwestern University*

**9:20 AM**

**Structure, Morphology and Oxidation State Determination of Iron-Substituted CuInS<sub>2</sub> Materials Prepared by High-Temperature Solid-State Synthesis:** *Johanna Burnett<sup>1</sup>; Balamurugan Karuppanan<sup>1</sup>; Jacilynn Brant<sup>1</sup>; Jacqueline Sturgeon<sup>2</sup>; Kristin Bunker<sup>2</sup>; Karen Harris<sup>2</sup>; Jennifer Aitken<sup>1</sup>; <sup>1</sup>Duquesne University; <sup>2</sup>RJ Lee Group*

**9:40 AM Break**

**10:00 AM Invited**

**Structural Accommodation of Energy-Related Materials during Energy Conversion and Storage:** *Faisal Alamgir<sup>1</sup>; <sup>1</sup>Georgia Institute of Technology*

**10:40 AM Invited**

**Solid State Nuclear Magnetic Resonance Spectroscopy of Ordered and Disordered Materials:** *Randall Youngman<sup>1</sup>; <sup>1</sup>Corning Incorporated*

**11:20 AM**

**Concurrent Raman and Brillouin Scattering for Monitoring Polymer Network Assembly:** *Michael Aldridge<sup>1</sup>; John Kieffer<sup>1</sup>; <sup>1</sup>University of Michigan*

## Solution-Based Processing for Ceramic Materials: Solution Deposition, Assembly, and Patterning of Functional Films and Structures

*Program Organizer:* Geoff Brennecke, Sandia National Laboratories

Thursday AM

October 20, 2011

Room: C111

Location: Columbus Con. Center

*Session Chair:* Geoff Brennecke, Sandia National Laboratories

**8:00 AM Invited**

**Functional Oxide Thin Films for Energy Efficient Devices by Chemical Solution Deposition:** *Theodor Schneller<sup>1</sup>; <sup>1</sup>RWTH Aachen*

**8:20 AM Invited**

**Low Temperature Ferroelectric Thin Films: The Potential of the Novel Technology of Photochemical Solution Deposition:** *M.LOURDES CALZADA<sup>1</sup>; INIGO BRETOS<sup>1</sup>; RICARDO JIMENEZ<sup>1</sup>; <sup>1</sup>CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS*

**8:40 AM Invited**

**Solution Processing of Perovskite Thin Films for Optimized Functional Properties:** *Barbara Malic<sup>1</sup>; Sebastjan Glinsek<sup>1</sup>; Alja Kupec<sup>1</sup>; Elena Tchernychova<sup>1</sup>; Marija Kosec<sup>1</sup>; <sup>1</sup>Jožef Stefan Institute*

**9:00 AM**

**Spin Sprayed Nickel Copper Manganite Films for Thermal Imaging:** *Song Won Ko<sup>1</sup>; Jing Li<sup>1</sup>; Myoung-yun Lee<sup>1</sup>; Thomas Jackson<sup>1</sup>; Nikolas Podraza<sup>1</sup>; Elizabeth Dickey<sup>2</sup>; Susan Trolier-McKinstry<sup>1</sup>; <sup>1</sup>Pennsylvania State University; <sup>2</sup>North Carolina State University*

**9:20 AM**

**Chemical Solution Deposition of Lead Free (K<sub>0.5</sub>Na<sub>0.5</sub>)NbO<sub>3</sub> Piezoelectric Thin Films:** *Alja Kupec<sup>1</sup>; Elena Tchernychova<sup>1</sup>; Barbara Malic<sup>1</sup>; Marija Kosec<sup>1</sup>; <sup>1</sup>Jožef Stefan Institute*

**9:40 AM Break**

**10:00 AM**

**Curing Behavior in Photopolymerizable Ceramic Suspensions:** *Susan Gentry<sup>1</sup>; John Halloran<sup>1</sup>; <sup>1</sup>University of Michigan*

**10:20 AM Invited**

**Direct Patterning of Nano-Structured Ceramics from Solution: Differences from Conventional Printing and/or Lithographic Methods:** *Masahiro Yoshimura<sup>1</sup>; Nobuhiro Matsushita<sup>2</sup>; <sup>1</sup>(1) Tokyo Institute of Technology, Japan and (2) National Cheng Kung University, Taiwan; <sup>2</sup>Tokyo Institute of Technology*

**10:40 AM Invited**

**Construction of Highly Ordered Nanofilms through Langmuir-Blodgett Deposition of Oxide Nanosheets:** *Minoru Osada<sup>1</sup>; Takayoshi Sasaki<sup>1</sup>; <sup>1</sup>National Institute for Materials Science*

**11:00 AM**

**Bottom-Up Evolution of BaTiO<sub>3</sub> and SrTiO<sub>3</sub> Nanocubes in Ordering Structure:** *Ken-ichi Mimura<sup>1</sup>; Feng Dang<sup>1</sup>; Kazumi Kato<sup>1</sup>; Hiroaki Imai<sup>2</sup>; Satoshi Wada<sup>3</sup>; Hajime Haneda<sup>4</sup>; Makoto Kuwabara<sup>5</sup>; <sup>1</sup>National Institute of Advanced Industrial Science and Technology; <sup>2</sup>Keio University; <sup>3</sup>University of Yamanashi; <sup>4</sup>National Institute for Materials and Science; <sup>5</sup>Kyushu University*

**11:20 AM**

**Synthesis and Characterization of Phase-Change Nanowires Confined in Periodic Mesoporous Silica:** *Chandrasiri Ithalawela<sup>1</sup>; Martin Kordesch<sup>1</sup>; Gang Chen<sup>1</sup>; <sup>1</sup>Ohio University*

#### 11:40 AM Invited

**Microscale Patterning of Ceramic and Metallic Architectures:** *Jennifer Lewis*<sup>1</sup>; <sup>1</sup>University of Illinois

### Steel Product Metallurgy and Applications: Processing and Performance II

*Program Organizer:* Bhaskar Yalamanchili, Gerdau Ameristeel.com

Thursday AM  
October 20, 2011

Room: D132  
Location: Columbus Con. Center

*Session Chair:* To Be Announced

#### 8:00 AM

**Microstructural Evolution in Six Fe-Si Alloys under Different Hot and Cold Rolling Conditions:** *Dagoberto Silva*<sup>1</sup>; Martha Patricia Guerrero Mata<sup>2</sup>; Yvan Houbaert<sup>2</sup>; Rafael Colás<sup>2</sup>; Jesus Alejandro Sandoval<sup>2</sup>; <sup>1</sup>Facultad de Ingeniería Mecánica y Eléctrica (FIME) - Universidad Autónoma de Nuevo León (UANL); <sup>2</sup>FIME-UANL

#### 8:20 AM

**Effects of Cooling Rate on the Iron Loss and Microstructure of High Silicon Steels:** *Heejong Jung*<sup>1</sup>; Manho Na<sup>1</sup>; Sang-Beom Kim<sup>2</sup>; Jongryoul Kim<sup>1</sup>; <sup>1</sup>Hanyang university; <sup>2</sup>Korea Electric Power Research Institute

#### 8:40 AM

**Carbide spheroidization kinetics in a low alloy medium carbon steel: Relevance of deformation after transformation:** *Pello Uranga*<sup>1</sup>; Jon Arruabarrena<sup>1</sup>; Beatriz López<sup>1</sup>; Jose Rodriguez-Ibabe<sup>1</sup>; <sup>1</sup>CEIT and Tecnun

#### 9:00 AM

**A New Analytical Technique for Heat Treatment and Electroplating Process Control: GD-OES (Glow Discharge Optical Emission Spectrometry):** *Philippe Hunault*<sup>1</sup>; <sup>1</sup>HORIBA Scientific

#### 9:20 AM

**Effect of Austenitizing Temperatures on Hardness of Two Chromium Steel Quenched in Sea Water by Unsteady State Computer Simulation:** *Abdmanam Elmaryami*<sup>1</sup>; *Badrul Omar*<sup>1</sup>; <sup>1</sup>University [UTHM], Patu Bahat, Malaysia

#### 9:40 AM Break

#### 10:00 AM

**Four-Point Fatigue of Low Carbon Steels with Different Microstructures:** *Xiucheng Li*<sup>1</sup>; Linghui Du<sup>1</sup>; Wei Wen<sup>1</sup>; Chengjia Shang<sup>1</sup>; Tongguang Zhai<sup>1</sup>; <sup>1</sup>University of Science and Technology Beijing

#### 10:20 AM

**Effects of Continuous Annealing Process on Microstructures and Properties of C-Mn-Si Bearing Cold-Rolled TRIP Steel:** *Wang Lihui*<sup>1</sup>; <sup>1</sup>Wuhan Iron and Steel(Group)Corp.

#### 10:40 AM

**The Influence of Modification on Structure and Properties of Rapid Steel:** *Borys Sereda*<sup>1</sup>; Sergey Sheyko<sup>1</sup>; Yuriy Belokon<sup>1</sup>; Dmytro Sereda<sup>1</sup>; <sup>1</sup>ZSEA

#### 11:00 AM Cancelled

**Finishing Delivery Temperature Control for Non-Oriented Silicon Steel Strip in 1880mm:** *zou hongliu*<sup>1</sup>; Xu Jiachun<sup>1</sup>; <sup>1</sup>Bao shan Iron & steel Co., Ltd. Shanghai. China

#### 11:20 AM Cancelled

**A Thermodynamic Study on the Mn-Fe-Si-C System:** *M.K. Paek*<sup>1</sup>; <sup>1</sup>Hanyang University

### Structural Materials for Aerospace and Defense: Challenges and Prospects: Magnesium Alloys

*Program Organizer:* Roumiana Petrova, New Jersey Institute of Tech

Thursday AM  
October 20, 2011

Room: D242/243  
Location: Columbus Con. Center

*Session Chair:* Andrzej Wojcieszynski, AI Powder Metals

#### 8:00 AM Invited

**Mechanical Properties of Sensitized 5083 Al-Mg Structural Alloys:** *Ronald Holtz*<sup>1</sup>; Peter Pao<sup>1</sup>; Robert Bayles<sup>1</sup>; Thomas Longazel<sup>1</sup>; Ramasis Goswami<sup>2</sup>; <sup>1</sup>Naval Research Laboratory; <sup>2</sup>SAIC

#### 8:40 AM

**Microstructural Influence on Impact Properties of a Friction Stir Processed Mg-Y-RE Alloy:** *Kumar Kandasamy*<sup>1</sup>; Sushanta Panigrahi<sup>1</sup>; Rajiv Mishra<sup>1</sup>; Rick DeLorme<sup>2</sup>; Bruce Davis<sup>2</sup>; Ryan Howell<sup>3</sup>; Kyu Cho<sup>3</sup>; <sup>1</sup>Centre of Friction Stir Processing and Department of Materials science and Engineering Missouri University of Science & Technology, Rolla, MO 65409; <sup>2</sup>Magnesium Elektron North America Inc., Madison, IL 62060; <sup>3</sup>U.S. Army Research Laboratory, Aberdeen Proving Grounds, MD 21005

#### 9:00 AM

**Effect of Texture on the Formability and Mechanical Anisotropy of Severe Plastically Deformed Magnesium Alloys:** *Sonia Modarres-Razavi*<sup>1</sup>; David Foley<sup>1</sup>; Majid Al-Maharbi<sup>2</sup>; Ibrahim Karaman<sup>1</sup>; Karl Hartwig<sup>1</sup>; <sup>1</sup>Texas A&M University; <sup>2</sup>Sultan Qaboos University

#### 9:20 AM

**Low-Melting Point Metal Effects in the Ageing Response of Al-Mg-Si Alloys:** *Manuel Marya*<sup>1</sup>; <sup>1</sup>Schlumberger

#### 9:40 AM Break

### Structural Materials for Aerospace and Defense: Challenges and Prospects: Nickel-Based and New Alloys

*Program Organizer:* Roumiana Petrova, New Jersey Institute of Tech

Thursday AM  
October 20, 2011

Room: D242/243  
Location: Columbus Con. Center

*Session Chair:* Andrzej Wojcieszynski, AI Powder Metals

#### 10:00 AM

**The Impact of  $\gamma'$  Precipitate Evolution on the Mechanical Properties of the Low-Solvus-High-Refractory (LSHR) Nickel Base Superalloy:** *Samuel Kuhr*<sup>1</sup>; G.B. Viswanathan<sup>2</sup>; J.S. Tiley<sup>2</sup>; H.L. Fraser<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Air Force Research Laboratory

#### 10:20 AM

**Open-Cellular Co-Base and Ni-Base Superalloys Fabricated by Electron Beam Melting:** *K. Amato*<sup>1</sup>; L.E. Murr<sup>1</sup>; S. J. Li<sup>2</sup>; Y. X. Tian<sup>2</sup>; E. Martinez<sup>1</sup>; F. Medina<sup>3</sup>; <sup>1</sup>The University of Texas at El Paso; <sup>2</sup>Institute of Metal Research; <sup>3</sup>W.M. Keck Center for 3D Innovation

#### 10:40 AM

**Study of Precipitated Phases in an Fe-Ni-Co Base Superalloy:** *Gabriela González*<sup>1</sup>; Fernando González<sup>2</sup>; Martha Patricia Guerrero<sup>1</sup>; Maribel De la Garza<sup>1</sup>; Yvan Houbaert<sup>2</sup>; <sup>1</sup>Universidad Autónoma de Nuevo León; <sup>2</sup>University of Ghent

11:00 AM

**Processing and Properties of a New Al-Sc-Zr Alloy for High Temperature Applications:** *Nicholas Johnson<sup>1</sup>; Paul Sanders<sup>1</sup>; <sup>1</sup>Michigan Technological University*

11:20 AM

**High Temperature Microstructure and Properties of New L<sub>12</sub>-Containing Co-Al-W Alloys:** *Michael Titus<sup>1</sup>; Jun Zhu<sup>2</sup>; Alessandro Mottura<sup>1</sup>; Akane Suzuki<sup>3</sup>; Tresa Pollock<sup>1</sup>; <sup>1</sup>University of California, Santa Barbara; <sup>2</sup>University of Michigan; <sup>3</sup>GE Global Research*

## Synthesis, Properties and Applications of Noble Metal Nanostructures: Fabrication and Characterization of Noble Metal Nanoparticles

**Program Organizers:** *Ri-ichi Murakami, The University of Tokushima; Xiaoping Song, Xi'an Jiaotong University; Bingjun Ding, Xi'an Jiaotong University; Hong Yang, University of Rochester*

Thursday AM  
October 20, 2011

Room: C115  
Location: Columbus Con. Center

**Session Chairs:** *Xiaoping Song, Xi'an Jiaotong University; TaeGyu Kim, Pusan National University*

**8:00 AM** **Introductory Comments Prof. Ri-ichi Murakami**

**8:20 AM** **Invited**

**Nanoparticle Aggregation-Based Growth of Mesocrystals in Solution:** *Jixiang Fang<sup>1</sup>; Xiaoping Song<sup>1</sup>; Bingjun Ding<sup>1</sup>; <sup>1</sup>Xi'an Jiaotong University*

**8:40 AM**

**Untitled:** *Boris Bokhonov<sup>1</sup>; <sup>1</sup>Institute of solid state chemistry SB RAS*

**9:00 AM**

**Nanoporous Ag Prepared by Electrochemical Dealloying of Melt-Spun Cu-Ag-Si Alloys:** *Guijing Li<sup>1</sup>; Feifei Lu<sup>1</sup>; Linping Zhang<sup>1</sup>; zhanbo Sun<sup>1</sup>; Xiaoping Song<sup>1</sup>; Bingjun Ding<sup>1</sup>; Zhimao Yang<sup>1</sup>; <sup>1</sup>Xi'an Jiaotong University*

**9:20 AM**

**Thermal Stability of Nanopores in Palladium Alloys for Hydrogen Storage:** *David Robinson<sup>1</sup>; Markus Ong<sup>1</sup>; Benjamin Jacobs<sup>2</sup>; Ilke Arslan<sup>3</sup>; <sup>1</sup>Sandia National Laboratories; <sup>2</sup>Protech; <sup>3</sup>University of California, Davis*

**9:40 AM** **Break**

**10:00 AM** **Invited**

**Study on Transparent Conductive Properties of ZnO/Ag/ZnO/PET Multilayer Films:** *Pangpang Wang<sup>1</sup>; Xiaojing Yu<sup>1</sup>; Dongyan Zhang<sup>1</sup>; Xiaoping Song<sup>2</sup>; Ri-ichi Murakami<sup>1</sup>; <sup>1</sup>The University of Tokushima; <sup>2</sup>Xi'an Jiaotong University*

**10:20 AM**

**Surface Structure and Property of Colloidal Metal Nanoparticles:** *Miao Shi<sup>1</sup>; Alison Elder<sup>1</sup>; Hyun Soo Kwon<sup>1</sup>; Alan Friedman<sup>1</sup>; Zhenmeng Peng<sup>1</sup>; Hong Yang<sup>1</sup>; <sup>1</sup>University of Rochester*

**10:40 AM**

**Comparison of Characteristics of Nanoparticles by Physical and Chemical Fabrication Techniques:** *Chun-Hsien Wu<sup>1</sup>; Mitsuhiro Murayama<sup>1</sup>; William Reynolds Jr.<sup>1</sup>; <sup>1</sup>Virginia Tech*

**11:00 AM**

**Hierarchical Growth of Gold Threefold Mesocrystals:** *Yunxia Zhang<sup>1</sup>; Zhimao Yang<sup>1</sup>; Shaodong Sun<sup>1</sup>; <sup>1</sup>School of Science, MOE Key Laboratory for Non-Equilibrium Synthesis and Modulation of Condensed Matter, State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University*

**11:20 AM** **Concluding Comments Prof. TaeGyu Kim**

## Titanium Processing and Applications: Session I

**Program Organizer:** *Rodney Boyer, Boeing Company*

Thursday AM  
October 20, 2011

Room: D232  
Location: Columbus Con. Center

**Session Chair:** *To Be Announced*

**8:00 AM**

**A Novel Approach for Fabrication of a Titanium Aerospace Structure by Friction Stir Welding:** *Christopher Well<sup>1</sup>; Jay Marshall<sup>1</sup>; Landon Luick<sup>1</sup>; Bharat Jasthi<sup>2</sup>; Michael West<sup>1</sup>; Damon Fick<sup>1</sup>; <sup>1</sup>South Dakota School of Mines and Technology; <sup>2</sup>Arbegas Advanced Materials Processing and Joining Laboratory (AMP)*

**8:20 AM**

**Composite Titanium Powder Coated with Carbon Black Particles Using Wasted Black Ink and Mechanical Properties of Its Extruded Material:** *Takanori Mimoto<sup>1</sup>; Nozomi Nakanishi<sup>1</sup>; Thotsaphon Threrujirapapong<sup>1</sup>; Junko Umeda<sup>1</sup>; Katsuyoshi Kondoh<sup>1</sup>; <sup>1</sup>Osaka University*

**8:40 AM**

**Development of \946 and \945-\946 Titanium Alloys Using a Low Cost TiH<sub>2</sub> Powder Feedstock:** *Vineet Joshi<sup>1</sup>; Curt Lavender<sup>1</sup>; Vladimir Moxon<sup>2</sup>; Volodmyr Duz<sup>2</sup>; Eric Nyberg<sup>1</sup>; <sup>1</sup>Pacific Northwest National Laboratory; <sup>2</sup>ADMA Products, Inc.*

**9:00 AM**

**The Cold Compaction and Sintering Study of Two Low-Cost Ti and Ti Alloy Powders:** *Wei Chen<sup>1</sup>; Yukinori Yamamoto<sup>1</sup>; Thomas Muth<sup>1</sup>; William Peter<sup>1</sup>; Michael Clark<sup>1</sup>; Sarma Gorti<sup>1</sup>; Adrian Sabau<sup>1</sup>; Stephen Nunn<sup>1</sup>; Jim Kiggans<sup>1</sup>; Craig Blue<sup>1</sup>; James Williams<sup>2</sup>; Brian Fuller<sup>3</sup>; Kamal Akhtar<sup>3</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>Ohio State University; <sup>3</sup>Cristal US, Inc./ International Titanium Powder*

**9:20 AM**

**Static and Fatigue Performance of Friction Stir Welded Titanium I-Beams:** *Rahul Sharma<sup>1</sup>; Damon Fick<sup>1</sup>; Michael West<sup>1</sup>; Bharat Jasthi<sup>2</sup>; <sup>1</sup>South Dakota School of Mines and Technology; <sup>2</sup>Arbegas Advanced Materials Processing and Joining Laboratory (AMP)*

**9:40 AM** **Break**

**10:00 AM**

**Corrosion and Wear Investigation of Diode Laser Surface Treated Ti6Al4V Alloy:** *Samar Kalita<sup>1</sup>; Benjamin Waldera<sup>1</sup>; <sup>1</sup>Advanced Engineered Materials Center, University of North Dakota*

**10:20 AM**

**Recent Advances in Surface Hardening of Titanium with an Emphasis on Boriding and Its Potential Applications:** *Biplab Sarma<sup>1</sup>; K. S. Ravi Chandran<sup>1</sup>; <sup>1</sup>University of Utah*

**10:40 AM**

**Development of Low-Melting Ti-Zr-Ni(Cu) Filler Alloys for Brazing of Titanium:** *Dong-Myoung Lee<sup>1</sup>; Gerhard Welsch<sup>1</sup>; Yong-Hwan Kim<sup>2</sup>; <sup>1</sup>Case Western Reserve University; <sup>2</sup>KITECH*

**11:00 AM**

**Tribological Behavior of Oxygen Diffusion Treated Ti-6Al-4V with Different Cooling Rates:** *Dinesh Bansal<sup>1</sup>; Peter Blau<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory*

#### 11:20 AM

**Investigations of Diffusion between Tool and Work Piece during High-Speed Milling of Ti6Al4V with Fine Grain PCD Tools:** *Gert Adriaan Oosthuizen*<sup>1</sup>; Guven Akdogan<sup>1</sup>; <sup>1</sup>Stellenbosch University

#### 11:40 AM

**Surface Enhancement of Titanium for Capacitive Energy Storage:** *Gerhard Welsch*<sup>1</sup>; <sup>1</sup>CWRU

### Amorphous Materials: Common Issues within Science and Technology: Metallic Glass I

*Program Organizer:* Pierre Lucas, University of Arizona

Thursday PM  
October 20, 2011

Room: C211  
Location: Columbus Con. Center

*Session Chair:* Michael Atzmon, University of Michigan

#### 2:00 PM

**Medium Range Order in Oxide and Metallic Glasses:** *Dan Miracle*<sup>1</sup>; Brandon Reese<sup>2</sup>; John Perkins<sup>2</sup>; Philip Parilla<sup>2</sup>; <sup>1</sup>AF Research Laboratory; <sup>2</sup>National Renewable Energy Laboratory

#### 2:20 PM

**Virtual Design of Metallic Glass Alloys:** *Logan Ward*<sup>1</sup>; Peter Tsai<sup>1</sup>; Katharine Flores<sup>1</sup>; Wolfgang Windl<sup>1</sup>; <sup>1</sup>The Ohio State University

#### 2:40 PM

**Colloids as a Proxy for Binary Metallic Glasses: Visualizing Real Space Structure:** *Ryan Kramb*<sup>1</sup>; Katherine Jensen<sup>2</sup>; Daniel Miracle<sup>1</sup>; <sup>1</sup>Air Force Research Laboratory; <sup>2</sup>Harvard University

#### 3:00 PM

**Atomistic Modeling of Cu-Zr-Ti Bulk Metallic Glass:** *Anupriya Agrawal*<sup>1</sup>; Logan Ward<sup>1</sup>; Katharine Flores<sup>1</sup>; Wolfgang Windl<sup>1</sup>; <sup>1</sup>The Ohio State University

#### 3:20 PM Break

### Amorphous Materials: Common Issues within Science and Technology: Metallic Glass II

*Program Organizer:* Pierre Lucas, University of Arizona

Thursday PM  
October 20, 2011

Room: C211  
Location: Columbus Con. Center

*Session Chair:* Dan Miracle, AF Research Laboratory

#### 3:40 PM

**An Atomically Quantized Hierarchy of Shear Transformation Zones in a Metallic Glass:** *JongDu Joo*<sup>1</sup>; Dongchan Jang<sup>2</sup>; *Michael Atzmon*<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>California Institute of Technology

#### 4:00 PM

**Angular Correlations in Coherent Electron Nanodiffraction from a Bulk Metallic Glass:** *Jinwoo Hwang*<sup>1</sup>; *Paul Voyles*<sup>1</sup>; <sup>1</sup>University of Wisconsin, Madison

#### 4:20 PM

**Simulating the Deformation of Metallic Glasses Using a Mesoscale Kinetic Monte Carlo Model:** *Pengyang Zhao*<sup>1</sup>; Ju Li<sup>2</sup>; Yunzhi Wang<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>University of Pennsylvania

#### 4:40 PM

**Homogeneous Flow in Bulk Metallic Glass at Room Temperature:** *Hua Guo*<sup>1</sup>; Jingwei Deng<sup>1</sup>; *Manling Sui*<sup>2</sup>; <sup>1</sup>Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences; <sup>2</sup>Beijing University of Technology

### Controlled Synthesis, Processing and Applications of Structural and Functional Nanomaterials: Nanomaterial Applications

*Program Organizers:* Kathy Lu, Virginia Tech; Xudong Wang, University of Wisconsin - Madison; Eugene Olevsky, San Diego State University; Gurpreet Singh, Kansas State University; Nitin Chopra, The University of Alabama; Pu-Xian Gao, University of Connecticut; Jianyu Liang, Worcester Polytechnic Institute

Thursday PM  
October 20, 2011

Room: C123  
Location: Columbus Con. Center

*Session Chair:* Jianyu Liang, Worcester Polytechnic Institute

#### 2:00 PM Invited

**The Feasibility of Manufacturing Nanocomposite Materials by Introducing Nano-Sized Titanium Carbide Particles into Molten Aluminum Alloys:** *A.M. Nabawy*<sup>1</sup>; Makhlof Makhlof<sup>1</sup>; <sup>1</sup>WPI

#### 2:40 PM

**Aerosol Jet® Material Deposition for High Resolution Printed Electronic Applications:** *Michael O'Reilly*<sup>1</sup>; Michael Renn<sup>1</sup>; Richard Grylls<sup>1</sup>; <sup>1</sup>Optomec Inc.

#### 3:00 PM

**Synthesis of TiO<sub>2</sub>/SnO<sub>2</sub> Bifunctional Nanocomposites:** *Huaming Yang*<sup>1</sup>; Chengli Huo<sup>1</sup>; <sup>1</sup>Central South University

### Failure Analysis and Prevention: Fatigue and Fracture

*Program Organizers:* Andrew Spowage, The University of Nottingham, Malaysia Campus; Tom Ackerson, IMR Metallurgical Services; Larry Hanke, Materials Evaluation and Engineering, Inc

Thursday PM  
October 20, 2011

Room: D235  
Location: Columbus Con. Center

*Session Chairs:* Nick Cherolis, Rolls-Royce Corporation; Daniel Benac, Baker Engineering and Risk Consultants, Inc.; Erhan Ulvan, Acuren Group Inc.

#### 2:00 PM

**Fatigue in the Aerospace Industry - Is it HCF or LCF?:** *Nicholas Cherolis*<sup>1</sup>; <sup>1</sup>Rolls-Royce Corporation

#### 2:20 PM

**Failure Analysis of Ruptured CNG Cylinder:** *RAM PRASAD*<sup>1</sup>; <sup>1</sup>IIT BOMBAY

#### 2:40 PM

**Reverse Engineered Forging Fatigue Failure:** *Edward Vojcak*<sup>1</sup>; <sup>1</sup>A. Finkl & Sons

#### 3:00 PM

**Architectural Failure of an Historical False Ceiling in a High School Building:** *Giovanni Barla*<sup>1</sup>; Pier Giorgio Debernardi<sup>1</sup>; *Donato Firrao*<sup>1</sup>; Paolo Matteis<sup>1</sup>; <sup>1</sup>Politecnico di Torino



## 3:20 PM Break

## 3:40 PM

**Summary of Failure Analyses Activities at Brookhaven National Laboratory:** *Carl Czajkowski*<sup>1</sup>; <sup>1</sup>Brookhaven National Laboratory

## 4:00 PM

**Trailer Hitch Receiver Failure on a Class A Motorhome:** *William Carden*<sup>1</sup>; *Eric Van Iderstine*<sup>1</sup>; <sup>1</sup>McSwain Engineering, Inc.

## 4:20 PM

**An Analysis of a Premature Fatigue Failure of an Acid Bath Mixer's Shaft under the Combined Effects of Stresses, Stress Concentrators and Corrosion Fatigue : Root Causes and Solutions:** *Pierre Dupont*<sup>1</sup>; <sup>1</sup>Schaeffler Belgium Sprl/Bvba

## 4:40 PM

**Fatigue Failure in Tungsten Carbide:** *Theodore Wilken*<sup>1</sup>; <sup>1</sup>Exova, Inc

## 5:00 PM

**Fatigue Analysis of Titanium Fitting:** *Ashley Vayer-Jenkins*<sup>1</sup>; <sup>1</sup>Spirit AeroSystems

## 5:20 PM

**Failure Analysis of a Furling Mast of a 42-Foot Catalina Boat:** *Erhan Ulvan*<sup>1</sup>; <sup>1</sup>Acuren Group Inc.

## Fatigue and Microstructure: A Symposium on Recent Advances: Very High Cycle Fatigue

**Program Organizers:** Amit Shyam, Oak Ridge National Laboratory; Sushant Jha, Air Force Research Laboratory/Universal Technology Corporation; Michael Caton, US Air Force Research Laboratory

Thursday PM  
October 20, 2011

Room: D240/241  
Location: Columbus Con. Center

**Session Chairs:** Claude Bathias, Paris X Nanterre University; Martina Zimmermann, Universität Siegen

## 2:00 PM

**Assessing the Role of Microstructure Variability in the Very High Cycle Fatigue Behavior of Structural Alloys:** *J. Wayne Jones*<sup>1</sup>; <sup>1</sup>University of Michigan

## 2:40 PM

**Characterization and Simulation of the Damage Accumulation in the Very High Cycle Fatigue (VHCF) Regime in a Metastable Austenitic Stainless Steel Based on the Resonant Behavior:** *Andrei Grigorescu*<sup>1</sup>; *Philipp Hilgendorff*<sup>1</sup>; *Martin Kuebbeler*<sup>1</sup>; *Martina Zimmermann*<sup>1</sup>; *Claus-Peter Fritzen*<sup>1</sup>; *Hans-Juergen Christ*<sup>1</sup>; <sup>1</sup>Universitaet Siegen

## 3:00 PM

**Evolution of Cyclic Plastic Deformation in Steel, up to Initiation at 10<sup>9</sup> Cycles:** *Claude Bathias*<sup>1</sup>; <sup>1</sup>University Paris Pouest

## 3:20 PM Break

## 3:40 PM

**Influence of Microstructure on VHCF Lifetime under Constant and Variable Amplitude Loading Condition:** *Herwig Mayer*<sup>1</sup>; <sup>1</sup>BOKU

## 4:20 PM

**Localization of crack initiation sites during fatigue of an austenitic-ferritic duplex steel in the high and very high cycle fatigue (HCF/VHCF) regime:** *Benjamin Doenges*<sup>1</sup>; *Helge Knobbe*<sup>1</sup>; *Philipp Koester*<sup>1</sup>; *Claus-Peter Fritzen*<sup>1</sup>; *Hans-Juergen Christ*<sup>1</sup>; *Ulrich Krupp*<sup>2</sup>; <sup>1</sup>Universitaet Siegen; <sup>2</sup>Hochschule Osnabrueck

## 4:40 PM

**Effect of Microstructure Evolution on the High Temperature, High Cycle Fatigue Properties of Two Ni-Based Superalloys:** *Govindarajan Muralidharan*<sup>1</sup>; *Rick Battiste*<sup>1</sup>; *Edward Kenik*<sup>1</sup>; *James Bentley*<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory

## 5:00 PM

**Very High Cycle Fatigue (VHCF) Behavior of Notched Ultrasonic Fatigue Samples from Precipitation-Hardened Aluminum Alloys and Welded Joints:** *Martina Zimmermann*<sup>1</sup>; *Martin Cremer*<sup>1</sup>; *Hans-Juergen Christ*<sup>1</sup>; <sup>1</sup>Universitaet Siegen

## Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches -- Fundamental and Engineering Issues: Interfaces and Charge Storage

**Program Organizers:** Wayne Kaplan, Technion - Israel Institute of Technology; Paul Wynblatt, Carnegie Mellon University; Dominique Chatain, Centre Interdisciplinaire de Nanoscience de Marseille; Mikel Holcomb, West Virginia University

Thursday PM  
October 20, 2011

Room: C120  
Location: Columbus Con. Center

**Session Chair:** Mikel Holcomb, West Virginia University

## 2:00 PM Invited

**Robust Isothermal Electric Control of Exchange Bias At Room Temperature:** *Christian Binek*<sup>1</sup>; *Xi He*<sup>1</sup>; *Ning Wu*<sup>1</sup>; *A. Wysocki*<sup>1</sup>; *T. Komesu*<sup>1</sup>; *U. Lanke*<sup>2</sup>; *A. Caruso*<sup>3</sup>; *E. Vescovo*<sup>4</sup>; *K. Belashchenko*<sup>1</sup>; *P. Dowben*<sup>1</sup>; <sup>1</sup>University of Nebraska-Lincoln; <sup>2</sup>Canadian Light Source Inc.; <sup>3</sup>University of Missouri; <sup>4</sup>Brookhaven National Laboratory

## 2:20 PM Invited

**Stabilizing Novel Ground States at Complex Oxide Interfaces:** *Yuri Suzuki*<sup>1</sup>; *Franklin Wong*<sup>2</sup>; *Chunyang He*<sup>1</sup>; *Seung-Hyub Baek*<sup>3</sup>; *Ho Wan Jang*<sup>3</sup>; *Chang Beom Eom*<sup>3</sup>; <sup>1</sup>UC Berkeley & LBNL; <sup>2</sup>UC Berkeley; <sup>3</sup>University of Wisconsin, Madison

## 2:40 PM

**Molecular Dynamics Study of Thermal Transport at Copper Phthalocyanine-Metal Interface:** *Chen Shao*<sup>1</sup>; *Yansha Jin*<sup>1</sup>; *Max Shtein*<sup>1</sup>; *Kevin Pipe*<sup>1</sup>; *John Kieffer*<sup>1</sup>; <sup>1</sup>University of Michigan

## 3:00 PM Invited

**Linear Dichroism Dependence on Ferroelectric Polarization:** *Srinivas Polisetty*<sup>1</sup>; *Jinling Zhou*<sup>1</sup>; *Disheng Chen*<sup>1</sup>; *Lane Martin*<sup>2</sup>; *Andreas Scholl*<sup>3</sup>; *Mikel Holcomb*<sup>1</sup>; <sup>1</sup>West Virginia University; <sup>2</sup>University of Illinois at Urbana-Champaign, Urbana; <sup>3</sup>Advanced Light Source

## 3:20 PM Break

## 3:40 PM Invited

**Materials by Design: A Magnetization Graded Multiferroic Composite for Ultra Sensitive Magnetic Field Sensors:** *Sanjay Mandal*<sup>1</sup>; *Gollapudi Sreenivasulu*<sup>1</sup>; *Vladimir Petrov*<sup>1</sup>; *Gopalan Srinivasan*<sup>1</sup>; <sup>1</sup>Oakland University

## 4:00 PM

**Stability and Interfacial Reactions in Pt Catalysts Based on BaCeO<sub>3</sub> Perovskite Oxide Supports:** *Minghao Fang*<sup>1</sup>; *Michael Katz*<sup>1</sup>; *Shuyi Zhang*<sup>1</sup>; *Hongjie Wang*<sup>1</sup>; *Mingjie Xu*<sup>1</sup>; *George Graham*<sup>1</sup>; *Xiaoqing Pan*<sup>1</sup>; <sup>1</sup>University of Michigan

## 4:20 PM

**Preparation of High Coercive Nd-Fe-B Sintered Magnet with High Magnetic and Mechanical Properties by Optimizing Grain Boundary Structure:** *Jin Woo Kim*<sup>1</sup>; *Se Hoon Kim*<sup>1</sup>; *Sun Yong Song*<sup>1</sup>; *Young Do Kim*<sup>1</sup>; <sup>1</sup>Hanyang University



#### 4:40 PM

**Ferroelectric Domain Wall Structures and Energies of BiFeO<sub>3</sub> from First-Principles Calculations:** Yi Wang<sup>1</sup>; Benjamin Winchester<sup>1</sup>; Zi-Kui Liu<sup>1</sup>; Long-Qing Chen<sup>1</sup>; Chris Nelson<sup>2</sup>; Xiaoqing Pan<sup>2</sup>; <sup>1</sup>Penn State; <sup>2</sup>The University of Michigan

#### 5:00 PM

**Structural Analysis of Nonbonded Interfaces between Dissimilar Materials by Molecular Dynamics Simulation:** Katherine Becker<sup>1</sup>; Chen Shao<sup>1</sup>; John Kieffer<sup>1</sup>; <sup>1</sup>University of Michigan

### International Symposium on Advances in Nanostructured Materials and Applications: The 2011 Acta Materialia Gold Medal Symposium: Nanometals III: Bulk Nanostructured Metals

**Program Organizers:** Haiyan Wang, Texas A&M University; Nuggehalli Ravindra, New Jersey Institute of Technology; Alan Ardell, National Science Foundation; Yuntian Zhu, North Carolina State University; Xinghang Zhang, Texas A&M University; Rajiv K. Singh, University of Florida; John Prater, Army Research Office

Thursday PM  
October 20, 2011

Room: E170  
Location: Columbus Con. Center

**Session Chairs:** Yuntian Zhu, North Carolina State University; Yonghao Zhao, University of California, Davis

#### 2:00 PM Invited

**Mechanical Properties of Bulk Nanostructured 7075 Al Alloy Prepared by Severe Plastic Deformation:** Yonghao Zhao<sup>1</sup>; Ying Li<sup>1</sup>; Xiaozhou Liao<sup>2</sup>; Troy Topping<sup>1</sup>; Ruslan Z. Valiev<sup>3</sup>; Yuntian Zhu<sup>4</sup>; Enrique J. Lavernia<sup>1</sup>; <sup>1</sup>University of California Davis; <sup>2</sup>School of Aerospace, Mechanical and Mechatronic Engineering, The University of Sydney, NSW, 2006, Australia; <sup>3</sup>Institute of Physics of Advanced Materials, Ufa State Aviation Technical University, 12 K. Marksa str., Ufa 450000, Russia; <sup>4</sup>Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC 27695-7919, USA

#### 2:20 PM Invited

**The Role of Crystallography and Nanostructures on Friction in FCC Metals:** Somuri Prasad<sup>1</sup>; Joseph Michael<sup>1</sup>; Corbett Battaille<sup>1</sup>; Paul Kotula<sup>1</sup>; Bhaskar Majumdar<sup>2</sup>; <sup>1</sup>Sandia National Laboratories; <sup>2</sup>New Mexico Institute of Mining and Technology

#### 2:40 PM

**Microstructure and Texture Evolution in Metals and Alloys during Intense Plastic Deformation:** Terry McNelley<sup>1</sup>; Alexander Zhilyaev<sup>2</sup>; Oscar Ruano<sup>2</sup>; Srinivasan Swaminathan<sup>3</sup>; <sup>1</sup>Naval Postgraduate School; <sup>2</sup>CENIM-CSIC and IMSP, RAS; <sup>3</sup>GE Global Research

#### 3:00 PM

**Accelerated Diffusion and Phase Transformations Driven by the Severe Plastic Deformation:** Boris Straumal<sup>1</sup>; Brigitte Baretzky<sup>2</sup>; Andrei Mazilkin<sup>3</sup>; Svetlana Protasova<sup>3</sup>; Eugen Rabkin<sup>4</sup>; Sergei Dobatkin<sup>5</sup>; Ruslan Valiev<sup>6</sup>; <sup>1</sup>MPI of Intelligent Systems; <sup>2</sup>Karlsruher Institut für Technologie (KIT), Institut für Nanotechnologie; <sup>3</sup>Institute of Solid State Physics, Russian Academy of Sciences; <sup>4</sup>Department of Materials Engineering, TECHNION – Israel Institute of Technology; <sup>5</sup>A.A. Baikov Institute of Metallurgy and Materials Science, Russian Academy of Sciences; <sup>6</sup>Ufa State Aviation Technical University

#### 3:20 PM

**High Strength Ductile Glassy NanoMaterial Microwires:** Alla Sergueeva<sup>1</sup>; Jason Walleiser<sup>1</sup>; Brian Meacham<sup>1</sup>; Daniel Branagan<sup>1</sup>; <sup>1</sup>The Nanosteel Co

#### 3:40 PM Break

#### 4:00 PM

**Synthesis, Structure and Mechanical Properties of FCC Based Nanostructured Alloys:** Koteswararao Rajulapati<sup>1</sup>; Sreedevi Varam<sup>1</sup>; Sreelatha K<sup>1</sup>; Chandra Shekar P<sup>1</sup>; B. S. Murty<sup>2</sup>; Bhanu Sankara Rao K<sup>1</sup>; <sup>1</sup>School of Engineering Sciences and Technology, University of Hyderabad, Hyderabad 500046 INDIA; <sup>2</sup>Department of Metallurgical and Materials Engineering, IIT Madras, Chennai 600036 INDIA

#### 4:20 PM

**Harnessing Bulk Nano-Materials for High Pressure High Temperature (HPHT) Hostile Downhole Environments:** Indranil Roy<sup>1</sup>; Colin Longfield<sup>1</sup>; Rashmi Bhavsar<sup>1</sup>; Andrzej Anderko<sup>2</sup>; Enrique Lavernia<sup>3</sup>; Yuntian Zhu<sup>4</sup>; Farghalli Mohamed<sup>3</sup>; <sup>1</sup>Schlumberger; <sup>2</sup>OLI; <sup>3</sup>University of California; <sup>4</sup>North Carolina State University

#### 4:40 PM

**Structures and Properties of Higher Pressure Combustion Driven Compacted Nanocomposite Cryomilled Aluminum Alloy 7090 with Carbon Nanotubes:** Karthik Nagarathnam<sup>1</sup>; Dennis Massey<sup>1</sup>; Charles Lei<sup>2</sup>; Rabindra Mahapatra<sup>2</sup>; Robert Taylor<sup>2</sup>; <sup>1</sup>UTRON Kinetics LLC; <sup>2</sup>NAVAIR

#### 5:00 PM

**Aluminum MComP a Lightweight High Stiffness Alternative to AlBeMet:** Brian Doud<sup>1</sup>; <sup>1</sup>Powdermet Inc.

#### 5:20 PM

**Influence of the Subsequent Annealing on Nanostructured Steel Fabricated by Equal Channel Angular Pressing:** Maria Borisova<sup>1</sup>; Sofia Yakovleva<sup>1</sup>; Sussana Makharova<sup>1</sup>; <sup>1</sup>Institute of physical-technical problems of the North

#### 5:40 PM

**Finite Element Analysis of ECAP Process Using Al-1100 Material to Study the Effect of Process Parameters:** Rahul Sharma<sup>1</sup>; K Hans Raj<sup>1</sup>; Atul Dayal<sup>1</sup>; Ankit Sahai<sup>1</sup>; Rajat Setia<sup>1</sup>; <sup>1</sup>Dayalbagh Educational Institute

### Materials Degradation in Alternative Energy Systems: Session I

**Program Organizer:** Sean Brossia, DNV Columbus

Thursday PM  
October 20, 2011

Room: C223  
Location: Columbus Con. Center

**Session Chair:** Sean Brossia, DNV

#### 2:00 PM Introductory Comments

#### 2:20 PM

**Creep Studies of Modified 9Cr-1Mo Steel for Very High Temperature Reactor Pressure Vessels:** Zachary Wuthrich<sup>1</sup>; Triratna Shrestha<sup>1</sup>; Indrajit Charit<sup>1</sup>; Karl Rink<sup>1</sup>; Mehdi Basirat<sup>1</sup>; Gabriel Potirniche<sup>1</sup>; <sup>1</sup>University of Idaho

#### 2:40 PM

**Effect of Day/Night Cycle on the Oxidation Behavior of Fe and Ni-Based Alloys:** Sebastien Dryepondt<sup>1</sup>; Bruce Pint<sup>1</sup>; <sup>1</sup>ornl

#### 3:00 PM

**Effect of Environment on the Oxidation Behavior of ODS FeCrAl Alloy at 1100°C:** Emmanuel Essuman<sup>1</sup>; Kinga Unocic<sup>1</sup>; Sebastien Dryepondt<sup>1</sup>; <sup>1</sup>ornl

#### 3:20 PM Break

#### 3:40 PM

**Long-Term Environmental Degradation of a Thin Foil Primary Surface Recuperator Alloy:** Wendy Matthews<sup>1</sup>; Karren More<sup>2</sup>; <sup>1</sup>Capstone Turbine Corporation; <sup>2</sup>Oak Ridge National Laboratory

4:00 PM

**Synthesis and Characterization of Spinel-Supported Nanoparticulate Metal Catalysts:** *Katelyn Glass*<sup>1</sup>; Brenden Hill<sup>1</sup>; Scott Mixture; Scott Mixture<sup>1</sup>; <sup>1</sup>Alfred University

4:20 PM

**Embrittlement of Pipeline Steels by Gaseous and Cathodic Hydrogen:** *Richard Ricker*<sup>1</sup>; David Pitchure<sup>1</sup>; Andrew Slifka<sup>1</sup>; Nicholas Nanninga<sup>1</sup>; David McColskey<sup>1</sup>; R. Condon<sup>1</sup>; <sup>1</sup>NIST

4:40 PM

**Return On Investment of Structural Health Monitoring Systems for Wind Turbine Blades:** *Davion Hill*<sup>1</sup>; <sup>1</sup>Det Norske Veritas

5:00 PM Concluding Comments

## Materials for Nuclear Waste Disposal and Environmental Cleanup: Vitrification and Glass Characterization for Nuclear Materials Disposal

*Program Organizer:* Elizabeth Hoffman, Savannah River National Laboratory

Thursday PM  
October 20, 2011

Room: C226  
Location: Columbus Con. Center

*Session Chairs:* Kevin Fox, Savannah River National Laboratory; Fabienne Johnson, Savannah River National Laboratory

2:00 PM

**Effect of Moisture on the Self-Healing of Vitreous Silica Under Irradiation:** *Glenn Lockwood*<sup>1</sup>; Stephen Garofalini<sup>1</sup>; <sup>1</sup>Rutgers, the State University of New Jersey

2:20 PM

**Nepheline Crystallization in Nuclear Waste Glasses: Progress toward Acceptance of High-Alumina Formulations:** *John McCloy*<sup>1</sup>; Carmen Rodriguez<sup>2</sup>; Mike Schweiger<sup>1</sup>; Pavel Hrmal<sup>1</sup>; John Vienna<sup>1</sup>; <sup>1</sup>Battelle Pacific Northwest National Laboratory

2:40 PM

**Vitrification of DOE Problematic Wastes Using Iron Phosphate Glasses:** *C.W. Kim*<sup>1</sup>; D.E. Day<sup>1</sup>; C.L. Schwartz<sup>1</sup>; K. Barr<sup>1</sup>; T.E. Day<sup>1</sup>; R.K. Brow<sup>2</sup>; C.S. Ray<sup>2</sup>; <sup>1</sup>MO-SCI Corporation; <sup>2</sup>Missouri University of Science and Technology

3:00 PM

**Molybdenum Oxide Behavior in French HLW Nuclear Glass: Current State of Knowledge:** *Sophie Schuller*<sup>1</sup>; Dominique de Ligny<sup>2</sup>; Scott Kroeker<sup>3</sup>; Bruno Penelon<sup>1</sup>; Jacques Rogez<sup>4</sup>; Magali Magnin<sup>5</sup>; Ian Farnan<sup>6</sup>; <sup>1</sup>CEA/DEN/SECM/LDMC; <sup>2</sup>Laboratoire de Physico Chimie des Matériaux Luminescents; <sup>3</sup>Department of Chemistry; <sup>4</sup>CNRS - Laboratoire IM2NP, Université Paul Cézanne Aix Marseille III; <sup>5</sup>CEA/DEN/SECM/LMPA; <sup>6</sup>Department of Earth Sciences

3:20 PM Break

3:40 PM

**Analysis of Small-Scale Melter Run Samples from the DOE-EM Phosphate Glass Development and Demonstration Task:** *Fabienne Johnson*<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

4:00 PM

**Empirical Model for Formulation of Crystal-Tolerant HLW Glasses:** *Josef Matyas*<sup>1</sup>; John Vienna<sup>1</sup>; Alyssa Arrigoni<sup>1</sup>; Carmen Rogriquez<sup>1</sup>; <sup>1</sup>Pacific Northwest National Laboratory

4:20 PM

**Incorporation of High TiO<sub>2</sub> Concentrations in High Level Nuclear Waste Glass:** *Kevin Fox*<sup>1</sup>; Fabienne Johnson<sup>1</sup>; Thomas Edwards<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

4:40 PM

**Modeling and Predicting Nepheline Crystallization in Nuclear Waste Glasses:** *Jake Amoroso*<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

5:00 PM Cancelled

**Sulfate Retention in High Level Nuclear Waste Glasses:** *Amanda Billings*<sup>1</sup>; Kevin Fox<sup>1</sup>; <sup>1</sup>Savannah River National Laboratory

## Measurements and Modeling of Advanced Automotive and Structural Materials at Intermediate and High Strain Rates: Intermediate-to-High-Rate Modeling and Measurement

*Program Organizer:* Steven P. Mates, National Institute of Standards and Technology

Thursday PM  
October 20, 2011

Room: D231  
Location: Columbus Con. Center

*Session Chair:* Steven Mates, NIST

2:00 PM Invited

**Development of A Plasticity Model Using Generic Yield Surface Approach:** *Cing-Dao (Steve) Kan*<sup>1</sup>; Paul DuBois<sup>1</sup>; Kivanc Sengoz<sup>1</sup>; <sup>1</sup>The George Washington University

2:40 PM Invited

**Measurements and Modeling of Advanced Automotive and Structural Materials at Intermediate and High Strain Rates:** *Amos Gilat*<sup>1</sup>; <sup>1</sup>Ohio State University

3:20 PM Break

3:40 PM

**Comparison of Constitutive Model Parameters of Al 6061-T6 for Numerical Simulation of Electromagnetic Tube Compression:** *Jianhui Shang*<sup>1</sup>; Larry Wilkerson<sup>1</sup>; Steve Hatkevich<sup>1</sup>; <sup>1</sup>American Trim LLC

4:00 PM

**High Plasticity and Substantial Deformation in Nanocrystalline NiFe Alloys under Dynamic Loading:** *Yonghao Zhao*<sup>1</sup>; S. Cheng<sup>2</sup>; Y.Z. Guo<sup>3</sup>; Q.M. Wei<sup>3</sup>; X.-L. Wang<sup>4</sup>; Y. Ren<sup>5</sup>; P.K. Liaw<sup>2</sup>; E.J. Lavernia<sup>1</sup>; <sup>1</sup>University of California Davis; <sup>2</sup>University of Tennessee, Knoxville, USA; <sup>3</sup>University of North Carolina, Charlotte; <sup>4</sup>Oak Ridge National Laboratory, Oak Ridge; <sup>5</sup>Argonne National Laboratory, Argonne

4:20 PM

**Dynamic Fracture Characterizations of AHSS Beams with Notches under Impact Loading:** *Hong Zhu*<sup>1</sup>; Benda Yan<sup>1</sup>; Bui-Van Antoine<sup>1</sup>; Gang Huang<sup>1</sup>; Jayanth Chintamani<sup>1</sup>; <sup>1</sup>ArcelorMittal

4:40 PM

**The Strain Rate Effect on Tensile Properties and Fracture Strain of Advanced High Strength Steels:** *Gang Huang*<sup>1</sup>; Benda Yan<sup>1</sup>; Hong Zhu<sup>1</sup>; Jayanth Chintamani<sup>1</sup>; <sup>1</sup>ArcelorMittal USA LLC

5:00 PM

**Compression Behavior and Energy Absorption of Aluminum Alloys for Automotive Application:** *Simhachalam Bade*<sup>1</sup>; Natarajan R<sup>2</sup>; Lakshmana Rao C<sup>1</sup>; <sup>1</sup>Indian Institute of Technology-Madras; <sup>2</sup>Tube Investments of India

## Microwave Processing of Materials: Microwave Technology

**Program Organizers:** Morsi Mahmoud, Karlsruhe Institute of Technology (KIT); Guido Link, Karlsruhe Institute of Technology

Thursday PM  
October 20, 2011  
Room: C221  
Location: Columbus Con. Center

**Session Chairs:** Guido Link, Karlsruhe Institute of Technology; Morsi Mahmoud, Karlsruhe Institute of Technology

### 2:00 PM

**Continuous Microwave Furnaces for Industrial-Scale Sintering, Calcining and Drying Applications:** *Kuruvilla (Karl) Cherian*<sup>1</sup>; Michael Kirksey<sup>1</sup>; Henry Frese<sup>1</sup>; Milton Mathis<sup>2</sup>; <sup>1</sup>Spheric Technologies Inc; <sup>2</sup>M-Wave Consulting

### 2:20 PM

**Microwave Furnace for Pyrolysis of Electronic Components Finalized to Precious Metals Recovery Completed with Treatment for Smoke Emission:** *mauro colucci*<sup>1</sup>; <sup>1</sup>consultant

### 2:40 PM

**Industrial-Scale Microwave Sintering of Zirconia Based Dental Restorations:** *Kuruvilla (Karl) Cherian*<sup>1</sup>; Michael Kirksey<sup>1</sup>; Sandwip Dey<sup>2</sup>; <sup>1</sup>Spheric Technologies Inc; <sup>2</sup>Arizona State University

## Nanotechnology for Energy, Healthcare and Industry : Session IV

**Program Organizers:** Gary Pickrell, Virginia Tech; Suveen Mathaudhu, U.S. Army Research Office; Wolfgang Sigmund, University of Florida; Jud Ready, Georgia Tech; George Wei, Osram Sylvania; Ke Wang, Virginia Tech; Zhiwei Shan, Jiaotong University; Alpesh Shukla, Lawrence Berkeley National Laboratory; Nitin Chopra, The University of Alabama; Sudipta Seal, Univ of Central Florida; Navin Manjorran, Siemens Corporation; Julia Greer, California Institute of Technology

Thursday PM  
October 20, 2011  
Room: C125  
Location: Columbus Con. Center

**Session Chair:** Alpesh Shukla, Lawrence Berkeley National Laboratory

### 2:00 PM

**Nanotechnology: A Business Perspective:** *Scott Livingston*<sup>1</sup>; <sup>1</sup>Livingston Group of Companies LLC and Livingston Securities LLC

### 2:40 PM

**Random-Hole Optical Fiber Sensors for Industrial Applications:** *Ke Wang*<sup>1</sup>; Gary Pickrell<sup>1</sup>; <sup>1</sup>Virginia Tech

### 3:00 PM

**Nickel Oxide Nanoplates for Lithium Ion Batteries: A Study of Conversion Reactions Using Electron Energy Loss Spectroscopy:** *Alpesh Shukla*<sup>1</sup>; Jordi Cabana<sup>1</sup>; <sup>1</sup>Lawrence Berkeley National Laboratory

### 3:20 PM Cancelled

**Exploiting Interfacial Synergy: Energy Applications & Nanomaterials:** *Randy Vander Wal*<sup>1</sup>; <sup>1</sup>Penn State University

### 3:40 PM Break

### 4:00 PM

**Stabilization of Nanoparticles under Biological Conditions Using Peptoid Oligomers:** *David Robinson*<sup>1</sup>; George Buffleben<sup>1</sup>; Mary Langham<sup>1</sup>; Ronald Zuckermann<sup>2</sup>; <sup>1</sup>Sandia National Laboratories; <sup>2</sup>Lawrence Berkeley National Laboratory

### 4:20 PM

**Surfactant Effects on Dispersion Characteristics of Copper-Based Nanofluids for Thermal Transfer Applications:** *Michael Saterlie*<sup>1</sup>; Huseyin Sahin<sup>2</sup>; Barkan Kavlicoglu<sup>2</sup>; Yanming Liu<sup>2</sup>; Olivia Graeve<sup>1</sup>; <sup>1</sup>Alfred University; <sup>2</sup>Advanced Materials and Devices, Inc.

### 4:40 PM

**Nanomaterials: Innovation (R&T&I) Roadmaps - 2020 Keynote Lecture:** *Marcel VAN DE VOORDE*<sup>1</sup>; <sup>1</sup>University of technology DELFT NL

### 5:00 PM

**Dye-Sensitized Solar Cells Based on SnO<sub>2</sub>-Doped TiO<sub>2</sub> Photoelectrodes:** *Seok-Min Yong*<sup>1</sup>; Do Kyung Kim<sup>1</sup>; <sup>1</sup>Korea Advanced Institute of Science and Technology

## Next Generation Biomaterials: Biomaterials Engineering

**Program Organizers:** Roger Narayan, Univ of North Carolina & North Carolina State Univ; Kalpana Katti, North Dakota State University; Kajal Mallick, University of Warwick; Vilupanur Ravi, California State Polytechnic University, Pomona; Varshni Singh, Louisiana State University

Thursday PM  
October 20, 2011  
Room: C215  
Location: Columbus Con. Center

**Session Chair:** Lucille Giannuzzi, L.A. Giannuzzi & Associates LLC

### 2:00 PM Invited

**Multi-Signal FIB/SEM Tomography of Bone on Dental Implants:** *Lucille Giannuzzi*<sup>1</sup>; <sup>1</sup>L.A. Giannuzzi & Associates LLC

### 2:20 PM Invited

**PLGA Nanoparticles: A Versatile Platform for Drug Delivery:** *Cristina Sabliov*<sup>1</sup>; Carlos Astete<sup>1</sup>; Nipur Patel<sup>1</sup>; Kenneth Damann<sup>1</sup>; <sup>1</sup>LSU

### 2:40 PM

**Fatigue Behavior of Open-Cellular Ti-6Al-4V Biomedical Prototypes Fabricated by Electron Beam Melting:** *Shujun Li*<sup>1</sup>; Yuxing Tian<sup>1</sup>; Xuying Cheng<sup>1</sup>; Yulin Hao<sup>1</sup>; Rui Yang<sup>1</sup>; Lawrence E. Murr<sup>2</sup>; F. Medina<sup>2</sup>; <sup>1</sup>institute of metal research, chinese academy of sciences; <sup>2</sup>University of Texas at El Paso

### 3:00 PM

**Deposition & Characterization of Electrochemically Induced Hydroxy-Apatite Coating:** *Gautam Gupta*<sup>1</sup>; Varshni Singh<sup>2</sup>; Mukesh Kumar<sup>3</sup>; <sup>1</sup>Biomet Inc.,; <sup>2</sup>Louisiana State University; <sup>3</sup>Biomet Inc.,

### 3:20 PM Break

### 3:40 PM

**Human Fetal Liver Cell Culturing in Porous Hydroxyapatite/Hyaluronic Acid Composites:** *Anthony Finoli*<sup>1</sup>; Patrick Over<sup>2</sup>; Eva Schmelzer<sup>2</sup>; Jorg Gerlach<sup>2</sup>; Ian Nettleship<sup>1</sup>; <sup>1</sup>University of Pittsburgh; <sup>2</sup>McGowan Institute for Regenerative Medicine

### 4:00 PM

**Developing Specific Fluorescent Chemo-Sensors for Detecting Nitric Oxide:** *Eunhae Koo*<sup>1</sup>; Dong-sup Lee<sup>1</sup>; Lan-Hee Yang<sup>1</sup>; Ji Hye Lee<sup>1</sup>; Sangil Hyun<sup>1</sup>; <sup>1</sup>Korea Institute of Ceramic Engineering & Technology

### 4:20 PM

**Electrochemically Controlled Switching Properties in Bioinspired Polymer Nanocomposites:** *Aysegul Aygun*<sup>1</sup>; Larry Stephenson<sup>1</sup>; Tom Mahle<sup>2</sup>; Andrew Gewirth<sup>2</sup>; <sup>1</sup>U.S. Army Corps of Engineers; <sup>2</sup>University of Illinois at Urbana

4:40 PM

**Fatigue Life of Hydroxyapatite Whisker Reinforced Polyaryletherketones:** Timothy Conrad<sup>1</sup>; Gabriel Converse<sup>1</sup>; Ryan Roeder<sup>1</sup>; <sup>1</sup>University of Notre Dame

5:00 PM

**Corrosion Resistance and Cytotoxicity of Degradable Metallic Implants for Orthopedic Applications:** Puneet Gill<sup>1</sup>; Norman Munroe<sup>1</sup>; Amit Datye<sup>2</sup>; Rupak Dua<sup>1</sup>; Sharan Ramaswamy<sup>1</sup>; <sup>1</sup>Florida International University; <sup>2</sup>University of Tennessee Knoxville

5:20 PM Cancelled

**Extruded Starch as Novel Shape-Memory Bioresorbable Device:** Laurent CHAUNIER<sup>1</sup>; Denis LOURDIN<sup>1</sup>; Frédéric CHAUBET<sup>2</sup>; Didier LETOURNEUR<sup>2</sup>; Anne MEDDAHI-PELLE<sup>2</sup>; <sup>1</sup>INRA; <sup>2</sup>INSERM

## Periodic Cellular Materials: Current Status and Recent Progress: Gasarites, Foams, and Other Materials

**Program Organizer:** David Alexander, Los Alamos National Laboratory

Thursday PM

October 20, 2011

Room: D233

Location: Columbus Con. Center

**Session Chair:** David Alexander, Los Alamos National Laboratory

2:00 PM

**Fabrication of Porous Materials with Ordered Crystal-Porous Structure by Gas-Eutectic Solidification:** Lyudmyla Boyko<sup>1</sup>; <sup>1</sup>Acuren Group Inc.

2:20 PM

**Bubble Growth, Detachment, and Encapsulation in a Solidifying Metal Matrix:** Patrick Bowen<sup>1</sup>; Joe Licavoli<sup>1</sup>; Douglas Swenson<sup>1</sup>; <sup>1</sup>Michigan Technological University

2:40 PM

**Process Variable Influences on Microstructures in Electroplated Copper/Graphite Composites:** Amanda Sall<sup>1</sup>; Anthony Tan<sup>1</sup>; <sup>1</sup>Northwestern University

3:00 PM Break

3:20 PM

**Deformation Mechanisms in a Polymeric Cellular Composite with Porosity on Multiple Length-Scales:** Juliana Bernal Ostos<sup>1</sup>; Renaud Rinaldi<sup>1</sup>; Galen Stucky<sup>1</sup>; Frank Zok<sup>1</sup>; <sup>1</sup>University of California, Santa Barbara

3:40 PM

**Compressive Properties of Low Relative Density Materials, Both Engineered and Random Structures:** Carl Cady<sup>1</sup>; Edward Kober<sup>1</sup>; Dana Dattelbaum<sup>1</sup>; Chris Hammetter<sup>2</sup>; Frank Zok<sup>2</sup>; <sup>1</sup>Los Alamos National Laboratory; <sup>2</sup>UCSB

4:00 PM

**Effect of Al<sub>2</sub>O<sub>3</sub> Addition on Compressive Properties of Al Matrix Composite Foams:** Morteza Mirzaei<sup>1</sup>; Mostafa Alizadeh<sup>1</sup>; <sup>1</sup>Department of Materials Science and Engineering, International Center for Science, High Technology & Environmental Sciences

4:20 PM

**Optimal Design of Periodic Cellular Stents Using Numerical Simulations:** Sangil Hyun<sup>1</sup>; Soojung Kim<sup>1</sup>; Chang-Yeoul Kim<sup>1</sup>; <sup>1</sup>Korea Institute of Ceramic Engineering & Technology

## Processing, Microstructure and Properties of Cast Irons and Cast and Forged Specialty Steels: Cast and Rolled Steels

**Program Organizers:** Srinath Viswanathan, University of Alabama; Stephanie Will, The Timken Company

Thursday PM

October 20, 2011

Room: D142/143

Location: Columbus Con. Center

**Session Chair:** Stephanie Will, The Timken Company

2:00 PM

**Examining Hot Tear Initiation in Steel Casting with Trial Validation and Process Simulation:** Bob Puhakka<sup>1</sup>; Sam Scott<sup>2</sup>; Adi Sholapurwalla<sup>2</sup>; Jianzheng Guo<sup>3</sup>; <sup>1</sup>Alloy Casting Inc.; <sup>2</sup>ESI North America; <sup>3</sup>ESI US R&D

2:20 PM

**Researches Concerning Continuous Casting of Steels with Controlled Aluminium Content in Square Billets:** Ilie Butnariu<sup>1</sup>; Dana Butnariu<sup>1</sup>; Ioana Butnariu<sup>1</sup>; <sup>1</sup>University POLITEHNICA Bucharest

2:40 PM

**Microtexture Analysis of a Hot Rolled Silicon Electric Steel:** Jesús Sandoval<sup>1</sup>; Dagoberto Silva<sup>1</sup>; Adriana Salas<sup>1</sup>; Martha Guerrero<sup>1</sup>; Rafael Colás<sup>1</sup>; Yvan Houbart<sup>2</sup>; <sup>1</sup>Universidad Autónoma de Nuevo León; <sup>2</sup>Universiteit Gent

3:00 PM Break

3:20 PM

**Investigation on s Phase Precipitation of a Cast Duplex Stainless Steel:** Tian Liang<sup>1</sup>; Xiuhong Kang<sup>1</sup>; Xiaoqiang Hu<sup>1</sup>; Dianzhong Li<sup>1</sup>; Yiyi Li<sup>1</sup>; <sup>1</sup>Institute of Metal Research, Chinese Academy of Sciences

3:40 PM

**Effect of Austenitization Temperature on the Microstructure and Mechanical Properties of a UHS Steel with Mixed Bainite- Martensite Structures:** Fateme Yekkalam Tash<sup>1</sup>; Shahram Kheirandish<sup>1</sup>; <sup>1</sup>School of Science and Technology of Iran

## Solution-Based Processing for Ceramic Materials: Electric Field-Assisted Fabrication and Assembly

**Program Organizer:** Geoff Brennecke, Sandia National Laboratories

Thursday PM

October 20, 2011

Room: C111

Location: Columbus Con. Center

**Session Chair:** To Be Announced

2:00 PM Invited

**Electrophoretic Deposition of Ceramic Coatings on Metal Substrates:** Fangwei Guo<sup>1</sup>; Xiaotang Lu<sup>1</sup>; Ian Shapiro<sup>1</sup>; Ping Xiao<sup>1</sup>; <sup>1</sup>University of Manchester

2:20 PM

**Electrochemical Deposition of Nano Tuborous TiO<sub>2</sub> and Their Application:** Dewei Chu<sup>1</sup>; Kazumi Kato<sup>1</sup>; <sup>1</sup>National Institute of Advanced Industrial Science and Technology

2:40 PM

**Flexible Ceramic Nanofibermats for High Efficiency Particulate Air Filtration in Lunar Missions:** Apratim Biswas<sup>1</sup>; Wolfgang Sigmund<sup>1</sup>; <sup>1</sup>Department of Materials Science and Engineering, University of Florida



## Structural Materials for Aerospace and Defense: Challenges and Prospects: Methods of Processing and Properties of Alloys

Program Organizer: Roumiana Petrova, New Jersey Institute of Tech

Thursday PM Room: D242/243  
October 20, 2011 Location: Columbus Con. Center

Session Chair: Stacey Kerwien, US Army ARDEC

### 2:00 PM Invited

**Evaluation of Alternate Manufacturing Methods:** Joanna Frederick<sup>1</sup>; Jon Tirpak<sup>2</sup>; <sup>1</sup>U.S. Army ARDEC, Benet Laboratories; <sup>2</sup>Advanced Technology Institute

### 2:40 PM

**Novel TiAl Open Cellular Structures Fabricated by Electron Beam Melting:** J. Hernandez<sup>2</sup>; L.E. Murr<sup>1</sup>; S.M. Gaytan<sup>1</sup>; E. Martinez<sup>1</sup>; S.J. Li<sup>2</sup>; X.Y. Cheng<sup>2</sup>; F. Medina<sup>3</sup>; R.B. Wicker<sup>3</sup>; <sup>1</sup>University of Texas at El Paso; <sup>2</sup>Institute of Metals Research; <sup>3</sup>W. M. Keck Center for 3D Innovation

### 3:00 PM

**The Phase Transformation of Al<sub>2</sub>O<sub>3</sub>/Mg Nanocomposite Powders during High Energy Ball Milling:** Jinling Liu<sup>1</sup>; Chengying Xu<sup>1</sup>; Linan An<sup>1</sup>; <sup>1</sup>University of Central Florida

### 3:20 PM Break

### 3:40 PM

**Doping Effects on the Densification of Mo-Si-B Alloys via Reactive Sintering:** Jae-Il Jung<sup>1</sup>; Jian Luo<sup>1</sup>; <sup>1</sup>Clemson University

### 4:00 PM

**Mechanical and Functional Properties of Gas-Eutectic Materials:** Lyudmyla Boyko<sup>1</sup>; <sup>1</sup>Acuren Group Inc.

### 4:20 PM

**Processing-Mechanical Property Relationships in Direct Digitally Manufactured Polycarbonate:** Chanman Park<sup>1</sup>; Luke Brewer<sup>1</sup>; Yong Kwon<sup>1</sup>; Rudolf Panholzer<sup>1</sup>; Daniel Sakoda<sup>1</sup>; <sup>1</sup>Naval Postgraduate School

## Synthesis, Properties and Applications of Noble Metal Nanostructures: Functional Metal Thin Films

Program Organizers: Ri-ichi Murakami, The University of Tokushima; Xiaoping Song, Xi'an Jiaotong University; Bingjun Ding, Xi'an Jiaotong University; Hong Yang, University of Rochester

Thursday PM Room: C115  
October 20, 2011 Location: Columbus Con. Center

Session Chairs: Bingjun Ding, Xi'an Jiaotong University; Hong Yang, University of Rochester

### 2:00 PM

**Wetting Properties of Silicon Incorporated Diamond Like Carbon Films on Aluminum Substrate:** TaeGyu Kim<sup>1</sup>; HyeSung Kim<sup>1</sup>; SoonJik Hong<sup>2</sup>; Murakami Ri-Ichi<sup>3</sup>; <sup>1</sup>Pusan National University; <sup>2</sup>Kongju National University; <sup>3</sup>The University of Tokushima

### 2:20 PM

**Characteristic of Hybrid DLC Film Deposited by FCA-Ion Plating:** Yasuoka Manabu<sup>1</sup>; Lee In woo<sup>1</sup>; <sup>1</sup>AST

### 2:40 PM

**Effect of Film Thickness on Electrical and Optical Properties of Ag/ZnO Dual Layer Film:** Hiromi Yabe<sup>1</sup>; Eri Akita<sup>1</sup>; Daisuke Yonekura<sup>1</sup>; Ri-ichi Murakami<sup>1</sup>; <sup>1</sup>The university of Tokushima

### 3:00 PM

**Synthesis and Structural Analysis of Nickel-Doped Titanium Dioxide Nanoparticles:** Ashavani Kumar<sup>1</sup>; Ruby Chauhan<sup>2</sup>; Rampal Chaudhary<sup>2</sup>; <sup>1</sup>Department of Physics, National Institute of Technology, Kurukshetra 136 119 India; <sup>2</sup>Department of Chemistry, Sant Longowal Institute of Engg. & Tech., Longowal 148 106 India

### 3:20 PM Break

### 3:40 PM Invited

**Improved Field Emission Characteristics of Nano-Structured Carbon Based Thin Films:** Pankaj Koinkar<sup>1</sup>; Daisuke Yonekura<sup>1</sup>; Tae-Gyu Kim<sup>2</sup>; Mahendra More<sup>3</sup>; Ri-ichi Murakami<sup>1</sup>; <sup>1</sup>The University of Tokushima; <sup>2</sup>Pusan National University; <sup>3</sup>University of Pune

### 4:00 PM

**Synthesis and Optical Properties of Nanostructured Zn<sub>0.75</sub>Cd<sub>0.25</sub>O Thin Films:** Anurag Gaur<sup>1</sup>; Nisha Singhania<sup>1</sup>; Rajendra Singh<sup>2</sup>; <sup>1</sup>Department of Physics, National Institute of Technology Kurukshetra, India; <sup>2</sup>Department of Physics, Indian Institute of Technology Delhi, India

### 4:20 PM

**Investigations of Electronic Structure and Optical Properties of ZnO Films:** Dongyan Zhang<sup>1</sup>; Pangpang Wang<sup>1</sup>; Ri-ichi Murakami<sup>1</sup>; Xiaoping Song<sup>1</sup>; <sup>1</sup>The University of Tokushima

### 4:40 PM Concluding Comments Prof. Bingjun Ding

## Titanium Processing and Applications: Session II

Program Organizer: Rodney Boyer, Boeing Company

Thursday PM Room: D232  
October 20, 2011 Location: Columbus Con. Center

Session Chair: To Be Announced

### 2:00 PM

**Performance of Palladium Coatings on Titanium Grade 2:** Kavitha Tummala<sup>1</sup>; Sean Brossia<sup>1</sup>; Sharon Rad<sup>2</sup>; <sup>1</sup>DNV USA; <sup>2</sup>Ben-Gurion University of the Negev

### 2:20 PM

**Micro-Texture Evolution of Ti in Multilayer Sheets Processed by Accumulative Roll Bonding:** Liming Zhou<sup>1</sup>; Viola Acoff<sup>1</sup>; <sup>1</sup>The University of Alabama

### 2:40 PM

**Titanium for Capacitive Energy Storage:** Gerhard Welsch<sup>1</sup>; <sup>1</sup>CWRU

### 3:00 PM

**Mechanical Properties and Deformation in Multi-Scale Nanostructured Cu and Ti:** Yonghao Zhao<sup>1</sup>; Y. Li<sup>1</sup>; Troy Topping<sup>1</sup>; Y.T. Zhu<sup>2</sup>; R. Z. Valiev<sup>3</sup>; E.J. Lavernia<sup>1</sup>; <sup>1</sup>University of California Davis; <sup>2</sup>North Carolina State University; <sup>3</sup>Institute of Physics of Advanced Materials, Ufa State Aviation Technical University, 12 K. Marksa str., Ufa 450000, Russia

### 3:20 PM Break

### 3:40 PM

**Characterization of "Check-Mark" Alpha Precipitate in Titanium Alloys Using 2D and 3D Characterization Techniques:** Travis Presley<sup>1</sup>; Daniel Huber<sup>1</sup>; John Sosa<sup>1</sup>; Brian Welk<sup>1</sup>; Yufeng Zheng<sup>1</sup>; Hamish Fraser<sup>1</sup>; <sup>1</sup>The Ohio State University



**4:00 PM**

**High- Resolution SEM/(S)TEM Microstructural Characterization of Ti-6Al-4V Alloyed with Fe:** *Daniel Huber*<sup>1</sup>; Brian Welk<sup>1</sup>; Travis Presley<sup>1</sup>; John Sosa<sup>1</sup>; Hamish Fraser<sup>1</sup>; <sup>1</sup>The Ohio State University

**4:20 PM**

**Investigation and Characterization of Second Phase Precipitation during Tempering of Martensitic Ti-6 Al -2 Mo -2 Cr -2 Sn -2 Zr -S by SEM and (S) TEM:** *Jonathan Orsborn*<sup>1</sup>; Hamish Fraser<sup>1</sup>; Robert Williams<sup>1</sup>; Daniel Huber<sup>1</sup>; Yufeng Zheng<sup>1</sup>; <sup>1</sup>The Ohio State University

**4:40 PM**

**Microstructure Evolution during Controlled Dynamic Spheroidization of Ti-6Al-4V:** *Chan Hee Park*<sup>1</sup>; Chong Soo Lee<sup>2</sup>; <sup>1</sup>Korea Institute of Materials Science; <sup>2</sup>Pohang University of Science and Technology

**5:00 PM**

**Phase Transformation Identification in Beta Titanium Alloys Using ETMT and SSDTA:** *Yufeng Zheng*<sup>1</sup>; Robert Williams<sup>1</sup>; Boian Alexandrov<sup>1</sup>; Hamish Fraser<sup>1</sup>; <sup>1</sup>The Ohio State University

**5:20 PM**

**The Technological features of Titanium Aluminides Retrieving by SHS-compacting:** *Borys Sereda*<sup>1</sup>; Aleksandr Zherebtsov<sup>1</sup>; Dmytro Sereda<sup>1</sup>; <sup>1</sup>ZSEA

## MS&T'11 Poster Session: Biomaterial Technology

Tuesday AM  
October 18, 2011

Room: Exhibit Hall C  
Location: Columbus Con. Center

**001 A Novel Protocol for Synthesis of Pd/TiO<sub>2</sub>/SiO<sub>2</sub> Nanocomposite Following Sol-Gel Process:** *Arvind Prakash*<sup>1</sup>; Prem Pandey<sup>1</sup>; <sup>1</sup>Institute of Technology, Banaras Hindu University

**002 A Quantitative Method to Assess Free Iron Removal after Passivation:** *Sophie Yang*<sup>1</sup>; Lakshmi Sharma<sup>1</sup>; Bernice Aboud<sup>1</sup>; <sup>1</sup>DePuy Orthopaedics, Inc

**003 Biocompatibility of TiO<sub>2</sub> nanotubes on titanium via anodic oxidation and heat treatment:** *Il Song Park*<sup>1</sup>; Yu Kyoung Kim<sup>1</sup>; Ki Hyun Yu<sup>2</sup>; Hyeoung Ho Park<sup>3</sup>; Sung Mo Yang<sup>1</sup>; Tae Sung Bae<sup>1</sup>; Min Ho Lee<sup>1</sup>; <sup>1</sup>Chonbuk National University; <sup>2</sup>Jeonbuk Technopark; <sup>3</sup>BS. COREM Co., Ltd

**004 Calcination Study of Synthesized Nano Hydroxyapatite Using Cationic and Non Ionic Surfactants:** Tahira Siddique<sup>1</sup>; Shahid Amin<sup>2</sup>; Mohammad Mujahid<sup>3</sup>; Syed Shah<sup>4</sup>; <sup>1</sup>QAU; <sup>2</sup>Pinestech; <sup>3</sup>NUST; <sup>4</sup>Hazara University

**005 Calcium Phosphates for Drug Carrier: Adsorption and Release Kinetics of Drugs and Growth Factors:** *Solaiman Tarafder*<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; Susmita Bose<sup>1</sup>; <sup>1</sup>Washington State University

**006 Corrosion Susceptibility of Magnesium Based Biodegradable Alloys in Simulated Physiological Solutions:** *Puneet Gill*<sup>1</sup>; Norman Munroe<sup>1</sup>; Amit Datye<sup>2</sup>; <sup>1</sup>Florida International University; <sup>2</sup>University of Tennessee Knoxville

**007 Direct Cytotoxicity Evaluation of 63s Bioactive Glass Nanoparticles Using Yeast Model and Human Chondrocyte Cells by Microcalorimetry:** *Ali Doostmohammadi*<sup>1</sup>; Ahmad Monshi<sup>1</sup>; Mohammad Hossein Fathi<sup>1</sup>; <sup>1</sup>Isfahan University of Technology

**008 Effect of Crystallinity on Dissolution Properties of Plasma Sprayed Hydroxyapatite Coatings:** *Mangal Roy*<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; Susmita Bose<sup>1</sup>; <sup>1</sup>Washington State University

**009 Effect of Different Type of Kenaf Fiber Composite on the Mechanical Properties:** *Mohamad Nor Berhan*<sup>1</sup>; ZURAIDAH SALLEH<sup>1</sup>; NOR FAZLI ADULL MANAN<sup>1</sup>; YAKUB MD TAIB<sup>1</sup>; DAVID ISAAC<sup>2</sup>; <sup>1</sup>UNIVERSITI TEKNOLOGI MARA; <sup>2</sup>SWANSEA UNIVERSITY

**010 Effect of the Sintering Temperature on Microstructural Properties of a Bioceramic Bone Scaffold:** *Juan Vivanco*<sup>1</sup>; Aldo Araneda<sup>2</sup>; Heidi Ploeg<sup>1</sup>; <sup>1</sup>The University of Wisconsin, Madison; <sup>2</sup>Universidad Tecnica Federico Santa Maria

**011 Effects of Bioabsorbable Mg Alloys on Endothelialization:** *Puneet Gill*<sup>1</sup>; Norman Munroe<sup>1</sup>; Ebony Daniels<sup>1</sup>; <sup>1</sup>Florida International University

**012 Electrochemical Synthesis of Polyaniline over Prussian Blue Encapsulated Ormosil Electrodes and Its Application in the Electrochemical Oxidation of Cysteine:** *Dheeraj Chauhan*<sup>1</sup>; Prem Pandey<sup>1</sup>; <sup>1</sup>Institute of Technology, Banaras Hindu University

**013 Gelatin Stabilized Gold Nanoparticles Supported Titania Nanotubes: A Novel Platform for Medical Implants:** *YUKYOUNG KIM*<sup>1</sup>; Madhav Prasad Neupane<sup>1</sup>; Myong Hun Kang<sup>1</sup>; Ji Hyun Kong<sup>1</sup>; Il Song Park<sup>1</sup>; Hyeoung Ho Park<sup>2</sup>; Min Ho Lee<sup>1</sup>; <sup>1</sup>Institute of Oral Bioscience and BK 21 Program; <sup>2</sup>BS. COREM Co., Ltd.

**014 Heat Treatment Effect on Different Type of Kenaf Fiber Composite:** *ZURAIDAH SALLEH*<sup>1</sup>; MOHAMAD NOR BERHAN<sup>1</sup>; YAKUB MD TAIB<sup>1</sup>; DAVID ISAAC<sup>2</sup>; NOR FAZLI ADULL MANAN<sup>1</sup>; <sup>1</sup>UNIVERSITI TEKNOLOGI MARA; <sup>2</sup>SWANSEA UNIVERSITY

**015 Highly Sensitive Determination of Ascorbic Acid over Polyaniline Synthesized Electrochemically within Nanostructured Network of Sol-Gel Matrix:** *Vandana Singh*<sup>1</sup>; Richa Singh<sup>1</sup>; Prem Pandey<sup>1</sup>; <sup>1</sup>Institute of Technology, Banaras Hindu University

**016 Impact Strength and Post Impact Tensile Strength of Kenaf Powder/PP (with and without MAPP) with Different Powder Percentage and Sizes:** *NOR AMALINA NORDIN*<sup>1</sup>; YAKUB MD TAIB<sup>1</sup>; ZURAIDAH SALLEH<sup>1</sup>; MOHAMAD NOR BERHAN<sup>1</sup>; NOR FAZLI ADULL MANAN<sup>1</sup>; MOHD HAFEEZ MOHD AINI<sup>1</sup>; <sup>1</sup>UNIVERSITI TEKNOLOGI MARA

**017 In Vivo Evaluation of the Spark Plasma Sintered Al<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub>-CeO<sub>2</sub> Composites:** *Gultekin Goller*<sup>1</sup>; Ipek Akin<sup>1</sup>; Simona Cavalu<sup>2</sup>; Viorica Simon<sup>3</sup>; <sup>1</sup>Istanbul Technical University; <sup>2</sup>University of Oradea; <sup>3</sup>Babes-Bolyai University

**018 Nanofiber-Based Sensors for Oxygen Determination:** *Ruipeng Xue*<sup>1</sup>; Alex Roth<sup>1</sup>; Mariano Viapiano<sup>1</sup>; Dave Farson<sup>1</sup>; Andre Palmer<sup>1</sup>; John Lannutti<sup>1</sup>; <sup>1</sup>The Ohio State University

**019 Post Impact Tensile on Kenaf Powder Fiberglass Laminate:** *NOR FAZLI ADULL MANAN*<sup>1</sup>; ZURAIDAH SALLEH<sup>1</sup>; YAKUB MD TAIB<sup>1</sup>; MOHAMAD NOR BERHAN<sup>1</sup>; FADHLUL WAFI KEYA NORDIN<sup>1</sup>; <sup>1</sup>UNIVERSITI TEKNOLOGI MARA

**020 Post-Impact Fatigue of Short Kenaf Fibre Metal Laminates:** *YAKUB MD TAIB*<sup>1</sup>; ZURAIDAH SALLEH<sup>1</sup>; SYARIFAH YUNUS<sup>1</sup>; MOHD HAFEEZ MOHD AINI<sup>1</sup>; NOR FAZLI ADULL MANAN<sup>1</sup>; <sup>1</sup>UNIVERSITI TEKNOLOGI MARA

**021 Radiation Interactions in Biologically Important Materials:** *Pravina Pawar*<sup>1</sup>; Govind Bichile<sup>1</sup>; <sup>1</sup>Dept of Physics

**022 Sintering and Bioactivities of Hydroxyapatite:** *Monica Sawicki*<sup>1</sup>; Kyle Crosby<sup>1</sup>; Ling Li<sup>1</sup>; Leon Shaw<sup>1</sup>; Yong Wang<sup>1</sup>; <sup>1</sup>University of Connecticut

**023 SiO<sub>2</sub> and SrO Doped 946-TCP: Influence of Dopants on Mechanical and Biological Properties:** *Gary Fielding*<sup>1</sup>; Johanna Feuerstein<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; Susmita Bose<sup>1</sup>; <sup>1</sup>Washington State University

**024 Sr/Mg Doped 3D Interconnected Porous  $\beta$ -Tricalcium Phosphate Ceramic Scaffolds for Bone Tissue Engineering: In Vivo Evaluation in Rat and Rabbit Model:** *Solaiman Tarafder*<sup>1</sup>; William Dernel<sup>1</sup>; Neal Davies<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; Susmita Bose<sup>1</sup>; <sup>1</sup>Washington State University

**025 Structural Analysis and Characterization of Zn-Substituted Nano Hydroxyapatite:** *Uma Batra*<sup>1</sup>; Seema Kapoor<sup>2</sup>; <sup>1</sup>PEC Univ. of Technology; <sup>2</sup>University Institute of Chemical Engineering & Technology, Panjab University

**026 Synthesis and UV-Enhanced Cytotoxicity of Pure and Ni-Doped ZnS@ZnSe Quantum Dots:** *Melissa Cruz*<sup>1</sup>; Sonia Bailon<sup>1</sup>; <sup>1</sup>University of Puerto Rico at Mayagüez

**027 Synthesis of Prussian Blue/Palladium Nanocomposite and Its Application in the Electrocatalytic Determination of Hydrogen Peroxide:** *Ashish Pandey*<sup>1</sup>; Dheeraj Chauhan<sup>1</sup>; Prem Pandey<sup>1</sup>; <sup>1</sup>Institute of Technology, Banaras Hindu University

**028 The Deposition of Chitosan-Vancomycin-Gelatin-Calcium Phosphate Composite on Post Bio-Ceramics Coated Ti6Al4V:** *Ming-Jia Wang*<sup>1</sup>; Jung-Yi Lo<sup>1</sup>; Chi-Chum Yang<sup>1</sup>; Shiow-Kang Yen<sup>1</sup>; <sup>1</sup>National Chung-Hsing University

**029 Thin Film Storage Material W-DLC and Si-DLC on AISI-316 for Biomedical Applications:** *Fabian Lerma<sup>1</sup>; German Plazas<sup>1</sup>; Faruk Fonthal Rico<sup>1</sup>; Clara Goyes Lopez<sup>1</sup>; Carlos Rincon<sup>2</sup>; <sup>1</sup>Advanced Materials for Micro and Nanotechnology Group - Universidad Autonoma de Occidente; <sup>2</sup>FISICA DE BAJAS TEMPERATURAS - EDGAR HOLGUIN - Universidad del Cauca*

**030 Tricalcium Phosphate System in Drug Delivery and Bone Graft:** *Joe Edgington<sup>1</sup>; Susmita Bose<sup>1</sup>; Amit Bandyopadhyay<sup>1</sup>; <sup>1</sup>Washington State University*

## MS&T'11 Poster Session: Ceramic and Glass Materials

Tuesday AM  
October 18, 2011

Room: Exhibit Hall C  
Location: Columbus Con. Center

**031 Alumina-Based Composites Reinforced with Titanium Nanoparticles:** *Enrique Rocha<sup>1</sup>; José A. Rodríguez-García<sup>1</sup>; Sergio Mundo-Solis<sup>2</sup>; Juliana G. Gutiérrez-Paredes<sup>2</sup>; Elizabeth Refugio-García<sup>3</sup>; <sup>1</sup>Universidad Politécnica de Victoria; <sup>2</sup>ESIME-IPN; <sup>3</sup>Universidad Autónoma Metropolitana*

**032 Analysis of Load-Displacement Curve by Hertzian Indentation for Thermal Barrier Coating Durability:** *Kee Sung Lee<sup>1</sup>; Dong Heon Lee<sup>1</sup>; Yeon-Gil Jung<sup>2</sup>; <sup>1</sup>Kookmin University, South Korea; <sup>2</sup>Changwon University, South Korea*

**033 Characterization of Ceramic Powders during Compaction Using Electrical Measurements:** *Timothy Pruyn<sup>1</sup>; Rosario Gerhardt<sup>1</sup>; <sup>1</sup>Georgia Tech*

**034 Colloidal Processing of Diamond Particles for Diamond Film Fabrication on Graphene and Silicon Substrates:** *Brian Babcox<sup>1</sup>; David Snyder<sup>1</sup>; James Adair<sup>1</sup>; <sup>1</sup>The Pennsylvania State University*

**035 Copper (I) and (II) Containing Waveguiding Layers in Novel Silicate Glass:** *Hana Malichová<sup>1</sup>; Jarmila Spirková<sup>1</sup>; Martin Mika<sup>1</sup>; Stanislava Stara<sup>1</sup>; <sup>1</sup>ICT Prague*

**036 Correlation between Structure and Electronic Properties in Y1-xPrx Ba1.9Sr0.1 Cu3O7-d High Tc Superconductors:** *Muna Abbas<sup>1</sup>; <sup>1</sup>Baghdad University*

**037 Critical analysis of experimental methods for reliable oxidation rate measurements of ultra-high temperature ceramics using thermal gravimetric analysis up to 1600°C:** *Melia Miller-Oana<sup>1</sup>; Luke Walker<sup>1</sup>; William Pinc<sup>1</sup>; Erica Corral<sup>1</sup>; <sup>1</sup>University of Arizona*

**038 Design and Development of Dichroic Glasses:** *Julie Dalbey<sup>1</sup>; S.K. Sundaram<sup>1</sup>; John Rich<sup>1</sup>; <sup>1</sup>Alfred University*

**039 Effect of % Boron on the Tribological Performance of Alumina Matrix Multifunctional Composites for Energy Efficient Sliding Systems:** *Rajeshwari Paluri<sup>1</sup>; Sudeep Ingole<sup>1</sup>; <sup>1</sup>Texas A&M University*

**040 Effect of Neutrons on the Microstructure Properties of Hg1-x-yTlxPbyBa2Ca2Cu3O8+δ for (0≤x≤0.4) and (0≤y≤0.4) System:** *Ghazala Hermiz<sup>1</sup>; Maysoon Alias<sup>1</sup>; Bushra Aljurani<sup>1</sup>; <sup>1</sup>baghdad university-college of science*

**041 Effect of Spark Plasma Sintering to the Structure and Some Properties Development for Mullite-ZrO2 Ceramics:** *Gaida Sedmale<sup>1</sup>; Ingunda Spergerga<sup>1</sup>; Ints Steins<sup>1</sup>; <sup>1</sup>Riga Technical University, Institute of Silicate Materials*

**042 Effect of Temperature on the Hydration of Activated Granulated Blast Furnace Slag:** *Enrique Rocha<sup>1</sup>; M. Juana Martínez-Alvarado<sup>2</sup>; Manuela Diaz-Cruz<sup>2</sup>; <sup>1</sup>Universidad Politécnica de Victoria; <sup>2</sup>ESIQIE-IPN*

**043 Fabrication and Corrosion Behavior of Ti-Based Bulk Metallic Glass Composites Containing Carbon Nanotubes:** *Pee-Yew Lee<sup>1</sup>; <sup>1</sup>National Taiwan Ocean University*

**044 Fabrication of ZrO2-SiC Composites from Natural Zircon Ore by Carbothermal Reduction:** *Youguo Xu<sup>1</sup>; Zhaohui Huang<sup>1</sup>; Yan-gai Liu<sup>1</sup>; Minghao Fang<sup>1</sup>; Xin Ouyang<sup>1</sup>; Li Yin<sup>1</sup>; <sup>1</sup>China University of Geosciences (Beijing)*

**045 Fracture Toughness Properties of WC-10Co Cemented Carbide Containing VC or (Ta, Nb)C Additives:** *Amir Masoud Soleimanpour<sup>1</sup>; <sup>1</sup>Sharif University of Technology*

**046 Gelcasting Process of Fused Silica-Boron Nitride Composite Ceramics:** *Lizhong Zhou<sup>1</sup>; Dechang Jia<sup>2</sup>; <sup>1</sup>The Chinese Ceramic Society; <sup>2</sup>Institute for Advanced Ceramics, Harbin Institute of Technology*

**047 Glass-Ceramic Composites for High Energy Density Capacitors:** *Venkata Puli<sup>1</sup>; Ashok Kumar<sup>1</sup>; Reji Thomas<sup>1</sup>; Douglas Chrisey<sup>2</sup>; Minoru Tomazawa<sup>2</sup>; Ram Katiyar<sup>1</sup>; <sup>1</sup>University of Puerto Rico; <sup>2</sup>Rensselaer Polytechnic Institute*

**048 Improving PZT Thin Film Texture through Pt Metallization and Seed Layers:** *Luz Sanchez<sup>1</sup>; Daniel Potrepka<sup>1</sup>; Glen Fox<sup>2</sup>; Ichiro Takeuchi<sup>3</sup>; Ronald Polcawich<sup>1</sup>; <sup>1</sup>Army Research Laboratory; <sup>2</sup>Fox Materials Consulting LLC; <sup>3</sup>University of Maryland*

**049 Investigation of Effective Parameters in Production of A356/ TiB2p Composite using of TiB2p/CMC/PPS Mortar:** *Mohammad Hizombor<sup>1</sup>; S.M.H. Mirbagheri<sup>2</sup>; Azam Rezaei<sup>3</sup>; Reza Abdideh<sup>1</sup>; <sup>1</sup>khuzestan oxin steel co.; <sup>2</sup>Amirkabir University of Technology; <sup>3</sup>Islamic Azad University*

**050 Investigation of ZnO:N and ZnO:(Al,N) Films for Solar Driven Hydrogen Production:** *Sudhakar Shet<sup>1</sup>; Yanfa Yan<sup>1</sup>; Nuggehalli Ravindra<sup>2</sup>; Heli Wang<sup>1</sup>; John Turner<sup>1</sup>; Mowafak Al-Jassim<sup>1</sup>; <sup>1</sup>National Renewable Energy Laboratory; <sup>2</sup>New Jersey Institute of Technology*

**051 Manufacture and Mechanical Characterization of Polymer-Composites Reinforced with Natural Fibers:** *Enrique Rocha<sup>1</sup>; Ernesto Benavides-Hernández<sup>1</sup>; Jose A. Rodríguez-García<sup>1</sup>; Alejandro Altamirano-Torres<sup>2</sup>; Y. Gabriela Torres-Hernández<sup>2</sup>; Francisco Sandoval-Pérez<sup>2</sup>; <sup>1</sup>Universidad Politécnica de Victoria; <sup>2</sup>Universidad Autónoma Metropolitana*

**052 Microstructure and Properties of Al2O3 Ceramic Composite Toughened by Different Grain Sizes of LiTaO3:** *Yan-gai LIU<sup>1</sup>; Minghao FANG<sup>1</sup>; Zhaohui HUANG<sup>1</sup>; Shaoping HUANG<sup>2</sup>; <sup>1</sup>China University of Geosciences (Beijing); <sup>2</sup>Luoyang Precondar Heat-resistant Testing Equipment Co.Ltd.*

**053 Polymer-Derived Mesoporous SiOC/ZnO Nanocomposite for Water Decontamination:** *Mirabbos Hojamberdiev<sup>1</sup>; Ravi Prasad<sup>1</sup>; Koji Morita<sup>1</sup>; Ralf Riedel<sup>1</sup>; <sup>1</sup>Technische Universitaet Darmstadt*

**054 Processing and Mechanical Properties of Bulk and Multilayer ZrB2 Using Tape Casting and Spark Plasma Sintering:** *David Pham<sup>1</sup>; William Pinc<sup>1</sup>; Luke Walker<sup>1</sup>; Erica Corral<sup>1</sup>; <sup>1</sup>University of Arizona*

**055 Processing of Alumina-Rich Spinel Nanopowders Made by Liquid Feed Flame Spray Pyrolysis (LF-FSP) to Fine-Grained Ceramic Composites:** *Andrew Pottebaum<sup>1</sup>; Richard Laine<sup>1</sup>; <sup>1</sup>University Of Michigan*

**056 Processing–Electronic Property Relations for Y1-xPrx Ba2 Cu3O7-d High TC Superconductors:** *Muna Abbas<sup>1</sup>*; <sup>1</sup>Baghdad University

**057 Properties and Fabrication of Carbon Nanotube Dispersed Al2O3 Composites by Spark Plasma Sintering :** *Byung-Koog Jang<sup>1</sup>*; Yoshio Sakka<sup>1</sup>; Hideyuki Murakami<sup>1</sup>; Seiji Kuroda<sup>1</sup>; Kee-Sung Lee<sup>2</sup>; <sup>1</sup>National Institute for Materials Science; <sup>2</sup>School of Mechanical Engineering, Kookmin University

**058 Properties Optimization of Refractory Mineral Resources in China:** Zhaohui Huang<sup>1</sup>; Minghao Fang<sup>1</sup>; Yan-gai Liu<sup>1</sup>; Juntong Huang<sup>1</sup>; Saifang Huang<sup>1</sup>; Wanzheng Zhu<sup>2</sup>; <sup>1</sup>China University of Geosciences (Beijing); <sup>2</sup>Beijing Weirunda Metallurgical Materials Co. Ltd.

**059 Raman Scattering as a Tool to Characterize the Changes of the Silicate Glass Structure after Ion Implantation:** *Blanka Svecova<sup>1</sup>*; Pavla Nekvindova<sup>1</sup>; Anna Mackova<sup>2</sup>; Petr Malinsky<sup>2</sup>; Vladimir Machovic<sup>1</sup>; Milos Janecek<sup>3</sup>; Josef Pesicka<sup>3</sup>; Jarmila Spirkova<sup>1</sup>; <sup>1</sup>Institute of Chemical Technology Prague; <sup>2</sup>Academy of Sciences of the Czech Republic, v.v.i.; <sup>3</sup>Charles University

**060 Structural Investigations on Yttria /Scandia Doped Ceria - Low Yttria Doped Y4S - Alumina Composites, a New Electrolyte for IT-SOFC:** *Nicoletta Popescu-Pogrión<sup>1</sup>*; Ionel Mercioniu<sup>1</sup>; Serban Cosntantinescu<sup>1</sup>; Jesus Tartaj<sup>2</sup>; <sup>1</sup>The National Institute of Materials Physics; <sup>2</sup>The Institute of Ceramics and Glass (ICV)

**061 Study on Reaction between Refractories and Flux with Slagging-under-Load Test:** *Akinori KUSUBASHI<sup>1</sup>*; Masaaki YAMAMOTO<sup>2</sup>; Kohichiroh KATAOKA<sup>2</sup>; Taijiro MATSUI<sup>2</sup>; Nozomu UCHIDA<sup>1</sup>; <sup>1</sup>Nagaoka University of technology; <sup>2</sup>Nippon Steel Corporation

**062 Substitution Grade Effect on the Synthesis and Magnetic Properties of Cu(Co,Zn)Fe2O4 Powders:** *Nora Sanchez-Padilla<sup>1</sup>*; *Antonio Fuentes<sup>2</sup>*; Sagrario Montemayor<sup>1</sup>; <sup>1</sup>Universidad Autonoma de Coahuila; <sup>2</sup>Cinvestav del IPN

**063 Synthesis and Characterization of New Lead-Free Low Melt Sealing Glasses:** *Maik Peschel<sup>1</sup>*; Jochen Schilm<sup>1</sup>; Alexander Michaelis<sup>1</sup>; <sup>1</sup>Fraunhofer Institute for Ceramic Technologies and Systems

**064 Synthesis and Study of the Chemical Interaction of Strontium Sulfaluminate Sr4Al6O12SO4 with Molten Aluminum Alloys:** *Jose Rodríguez-García<sup>1</sup>*; *Enrique Rocha<sup>1</sup>*; José Díaz-Rodríguez<sup>1</sup>; Jesús Torres-Torres<sup>2</sup>; Jose Almanza-Robles<sup>2</sup>; <sup>1</sup>Universidad Politécnica de Victoria; <sup>2</sup>CINVESTAV, Unidad Saltillo

**065 Synthesis of Ni and Ni-Co-Y2O3 Nano Powders by Using a Solution Combustion Synthesis in an Air Atmosphere:** *Choong-Hwan Jung<sup>1</sup>*; Young Min Han<sup>2</sup>; Sang Jin Lee<sup>2</sup>; Jin Sung Jang<sup>1</sup>; <sup>1</sup>KAERI; <sup>2</sup>Mokpo National University

**by Using a Solution Combustion Synthesis in an Air Atmosphere:** *Choong-Hwan Jung<sup>1</sup>*; Young Min Han<sup>2</sup>; Sang Jin Lee<sup>2</sup>; Jin Sung Jang<sup>1</sup>; <sup>1</sup>KAERI; <sup>2</sup>Mokpo National University

**066 Synthesis, Shaped and Mechanical Properties of Hydroxyapatite–Anatase Biomaterials:** Roberto Nava-Miranda<sup>1</sup>; *Enrique Rocha<sup>2</sup>*; Lucia Téllez-Jurado<sup>1</sup>; <sup>1</sup>ESIQIE-IPN; <sup>2</sup>Universidad Politécnica de Victoria

**067 Thermal Behavior and Kinetics of Glass Transition in B2O3 Containing Tungsten–Tellurite Glasses:** *Miray Çelikbilek<sup>1</sup>*; Ali Erçin Ersundu<sup>1</sup>; *Duygu Yardımcı<sup>1</sup>*; Süheyla Aydın<sup>1</sup>; <sup>1</sup>Istanbul Technical University

**068 Thermoplastic Extrusion of YAG Tubes:** *Nathan Taylor<sup>1</sup>*; Richard Laine<sup>1</sup>; <sup>1</sup>University of Michigan

**069 Zinc Oxide (ZnO) and Bandgap Engineering for Photoelectrochemical Splitting of Water to Produce Hydrogen:** *Sudhakar Shet<sup>1</sup>*; Yanfa Yan<sup>1</sup>; Heli Wang<sup>1</sup>; Nuggehalli Ravindra<sup>2</sup>; John Turner<sup>1</sup>; Mowafak Al-Jassim<sup>1</sup>; <sup>1</sup>National Renewable Energy Laboratory; <sup>2</sup>New Jersey Institute of Technology

## MS&T'11 Poster Session: Electronic and Magnetic Materials

Tuesday AM  
October 18, 2011

Room: Exhibit Hall C  
Location: Columbus Con. Center

**070 A Phenomenological Thermodynamic Potential of CaTiO<sub>3</sub> Single Crystals:** *Yijia Gu<sup>1</sup>*; Venkatraman Gopalan<sup>1</sup>; Karin Rabe<sup>2</sup>; Long-Qing Chen<sup>1</sup>; <sup>1</sup>The Pennsylvania State University; <sup>2</sup>Rutgers University

**071 An LTCC Clark-Type Oxygen Sensor:** *Jin Luo<sup>1</sup>*; Richard Eitel<sup>1</sup>; <sup>1</sup>University of Kentucky

**072 Dependence of Dielectric Properties on Ceramic Fillers of Polytetrafluoroethylene-Matrix Composites:** *Chang Jun Jeon<sup>1</sup>*; Dong Hyeok Im<sup>1</sup>; Eung Soo Kim<sup>1</sup>; <sup>1</sup>Kyonggi University

**073 Dielectric Properties in PMN-PT/CFO Particulate Magnetoelectric Composites:** *Fabio Zabotto<sup>1</sup>*; José Eiras<sup>1</sup>; Ducinei Garcia<sup>1</sup>; <sup>1</sup>Federal University of São Carlos

**074 Dielectric Properties of Chemically Bonded Phosphate Ceramics Fabricated with Wollastonite Powders:** *H. A. Colorado<sup>1</sup>*; Jenn M. Yang<sup>1</sup>; <sup>1</sup>University of California, Los Angeles

**075 Electronic Transport Studies of Bulk HgCdTe Based on an Ensemble Monte Carlo Calculation Including Three-Valley Band Structure Model:** *Hichem Tahir<sup>1</sup>*; <sup>1</sup>Abu-Bakr Belkaid University -Tlemcen, Faculty of Technology

**076 Ferroic and Structural Investigations in Rare Earth Modified TbMnO<sub>3</sub> Ceramics:** *Ivair Santos<sup>1</sup>*; Gustavo Dias<sup>1</sup>; Ricardo Gotardo<sup>1</sup>; Luiz Cótica<sup>1</sup>; Ducinei Garcia<sup>2</sup>; José Eiras<sup>2</sup>; Adelino Coelho<sup>3</sup>; <sup>1</sup>Universidade Estadual de Maringá; <sup>2</sup>Universidade Federal de São Carlos; <sup>3</sup>Universidade Estadual de Campinas

**077 Ferroic Properties Of Batio<sub>3</sub> Nanoparticles:** *Luiz Cótica<sup>1</sup>*; Marcos Alves<sup>1</sup>; Gustavo Dias<sup>1</sup>; Valdirlei Freitas<sup>1</sup>; Ricardo Gotardo<sup>1</sup>; Ivair Santos<sup>1</sup>; <sup>1</sup>Universidade Estadual de Maringá

**078 HR-TEM Investigations in BiFeO<sub>3</sub>-PbTiO<sub>3</sub> Multifunctional Ceramics:** *Ivair Santos<sup>1</sup>*; Valdirlei Freitas<sup>1</sup>; Flávia Estrada<sup>2</sup>; Luiz Cótica<sup>1</sup>; Ducinei Garcia<sup>2</sup>; José Eiras<sup>2</sup>; <sup>1</sup>Universidade Estadual de Maringá; <sup>2</sup>Universidade Federal de São Carlos

**079 Lab Scale Non-Destructive Compositional Analysis of PZT RF Sputtered Thin Films:** *Ron Varghese<sup>1</sup>*; Greg Pribil<sup>2</sup>; Shashank Priya<sup>1</sup>; <sup>1</sup>Virginia Polytechnic Institute and State University; <sup>2</sup>J.A. Woollam.Co

**080 Low Temperature Specific Heat of BiOX (X=Cl, Br and I) Single Crystals:** *Viktor Bunda<sup>1</sup>*; <sup>1</sup>Transcarpathian State University

**081 New Methodology of Improving the Etching Factor by Correlating between Microstructure and Residual Stress of Copper Pattern in Electronic Packages:** *Hyo-Soo Lee<sup>1</sup>*; Hai-Joong Lee<sup>1</sup>; <sup>1</sup>KITECH

**082 Phase-Field Simulation of Electric-Field-Induced Magnetic Domain Switching in Magnetic/Ferroelectric Heterostructures:** *Jiamian Hu<sup>1</sup>*; Guang Sheng<sup>2</sup>; Jingxian Zhang<sup>2</sup>; Cewen Nan<sup>1</sup>; Longqing Chen<sup>2</sup>; <sup>1</sup>Tsinghua University; <sup>2</sup>Pennsylvania State University

**083 Phase-Field Simulations of Ferroelectrics Domain Structures of PbZrxTi1-xO<sub>3</sub> Bilayers:** *Fei Xue<sup>1</sup>*; Valanoor Nagarajan<sup>2</sup>; Long-Qing Chen<sup>1</sup>; <sup>1</sup>Penn State University; <sup>2</sup>University of New South Wales



**084 Piezoelectric Properties of Ta Substituted-(K<sub>0.5</sub>Na<sub>0.5</sub>)NbO<sub>3</sub> Films:** *Sun Young Lee*<sup>1</sup>; Chang Won Ahn<sup>2</sup>; Ill Won Kim<sup>2</sup>; <sup>1</sup>Materials Research Institute; <sup>2</sup>Department of Physics

**085 S-Graded Buffer Layers for Semiconductor Devices:** *Sirjan Xhurxhi*<sup>1</sup>; Francis Obst<sup>1</sup>; David Sidoti<sup>1</sup>; Brandon Bertoli<sup>1</sup>; Tedi Kujofsa<sup>1</sup>; Sushma Cheruku<sup>1</sup>; Juan Correa<sup>1</sup>; Paul Rago<sup>1</sup>; Ernesto Suarez<sup>1</sup>; Faquir Jain<sup>1</sup>; John Ayers<sup>1</sup>; <sup>1</sup>University of Connecticut

**086 Some Electrical Properties of Soluble Conducting Polymer Polyhexylthiophene (PHT) Prepared by Electrochemical Polymerization:** *Kareema Ziadani*<sup>1</sup>; Krab Haykaz<sup>1</sup>; <sup>1</sup>Basrah University

**087 Synthesis and Ferroic Properties Studies in FeAlO<sub>3</sub>-Based Multifunctional Ceramics:** *Luiz Côtica*<sup>1</sup>; Guilherme Santos<sup>1</sup>; Gustavo Dias<sup>1</sup>; Valdirlei Freitas<sup>1</sup>; Ivair Santos<sup>1</sup>; <sup>1</sup>Universidade Estadual de Maringá

**088 The Chemisorption of Cobalt Atom on Noble Metal Surface:** *jenan AL-Mukh*<sup>1</sup>; <sup>1</sup>Basrah University

**089 The Electrical Properties of Polyaniline Blend with PolyMethacrylate as Conducting Polymers Alloys (PAni/PMMA):** *Kareema Ziadani*<sup>1</sup>; <sup>1</sup>Basrah University

**090 The Influence of Consolidation Parameters on Statistics Calculations Grain Contact Surfaces BaTiO<sub>3</sub>-Ceramics:** *Vojislav Mitic*<sup>1</sup>; Vesna Paunovic<sup>1</sup>; Jelena Purenovic<sup>1</sup>; Miroslav Miljkovic<sup>2</sup>; Jelena Nedin<sup>1</sup>; <sup>1</sup>University of Nis, Faculty of Electronic Engineering; <sup>2</sup>Laboratory for Electron Microscopy, University of Nis, Serbia

## MS&T'11 Poster Session: Environmental and Energy Issues

Tuesday AM  
October 18, 2011

Room: Exhibit Hall C  
Location: Columbus Con. Center

**091 Ag-LSM Composite Electrodes for Solid Oxide Fuel Cells:** *Anthony Seibert*<sup>1</sup>; Vladimir Petrovsky<sup>1</sup>; Fatih Dogan<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology

**092 Decarburization of Alloy 617 during Aging at Various High Temperatures:** *Tae Sun Jo*<sup>1</sup>; In-Mok Jeon<sup>1</sup>; Ji Yeon Park<sup>2</sup>; Young Do Kim<sup>1</sup>; <sup>1</sup>Hanyang University; <sup>2</sup>Korea Atomic Energy Research Institute

**093 Fabrication of LiM<sub>x</sub>Fe<sub>1-x</sub>PO<sub>4</sub> Glass and Glass-Ceramics for Lithium Ion Battery:** *Tsuyoshi Honma*<sup>1</sup>; Takayuki Komatsu<sup>1</sup>; <sup>1</sup>Nagaoka University of Technology

**094 Isotopic Enrichment Studies to Determine Elemental Diffusion Profiles Through an Established Alteration Layer:** *Joseph Ryan*<sup>1</sup>; A. Mitroshkov<sup>1</sup>; Z. Zhu<sup>1</sup>; C. Rodriguez<sup>1</sup>; J. Neeway<sup>1</sup>; <sup>1</sup>Pacific Northwest National Lab

**095 LiAlO<sub>2</sub> Solubility Measurement in (Li-K) Carbonate Melt:** *Kailash Patil*<sup>1</sup>; Prabhakar Singh<sup>1</sup>; <sup>1</sup>University of Connecticut

**096 Structure Characterization and Electrochemical Performance of LiFePO<sub>4</sub>/Carbon Hybrid for Li-Battery Cathode Materials:** *Yuki Matsuda*<sup>1</sup>; Masahiko Miyahara<sup>1</sup>; Hirokazu Sasaki<sup>1</sup>; Atsushi Nemoto<sup>1</sup>; Maki Moriya<sup>1</sup>; Hiroshi Okamura<sup>1</sup>; Shingo Katayama<sup>1</sup>; Yuji Akimoto<sup>1</sup>; Shin-ich Hirano<sup>2</sup>; <sup>1</sup>SHOEI CHEMICAL INC.; <sup>2</sup>National Institution for Academic Degrees and University Evaluation

**097 Ultra-Low Mass Planar SOFC Design:** *Jacqueline Brown*<sup>1</sup>; Michael Badding<sup>1</sup>; William Bouton<sup>1</sup>; Lanrik Kester<sup>1</sup>; Scott Pollard<sup>1</sup>; Cameron Tanner<sup>1</sup>; Patrick Tepesch<sup>1</sup>; <sup>1</sup>Corning Inc.

## MS&T'11 Poster Session: Fundamentals and Characterization

Tuesday AM  
October 18, 2011

Room: Exhibit Hall C  
Location: Columbus Con. Center

**098 3D Simulation of Sliding on Diamond-Coated Carbide Substrates:** *Kevin Chou*<sup>1</sup>; <sup>1</sup>University of Alabama

**099 A Triple Junction Distribution Function:** *Graden Hardy*<sup>1</sup>; David Field<sup>1</sup>; <sup>1</sup>School of Mechanical and Materials Engineering, Washington State University

**100 Adsorption of Pentacene on Silica Surfaces: An Ab Initio Study:** *Xiao Ma*<sup>1</sup>; Hossein Hashemi<sup>1</sup>; John Kieffer<sup>1</sup>; <sup>1</sup>University of Michigan

**101 Atomistic Modeling of Dislocation-Interface Interactions:** *Jian Wang*<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

**102 Characterisation and Modeling CuCrZr Electrode Degradation during Resistance Spot Welding:** *Elise Gauthier*<sup>1</sup>; Denis Carron<sup>1</sup>; Philippe Pilvin<sup>1</sup>; Philippe Rogeon<sup>1</sup>; Cédric Pouvreau<sup>1</sup>; Jacky Soigneux<sup>2</sup>; Thomas Lety<sup>2</sup>; François Primaux<sup>3</sup>; Christophe Meuret<sup>3</sup>; <sup>1</sup>University of South Brittany; <sup>2</sup>PSA Peugeot-Citroën; <sup>3</sup>Le Bronze Industriel

**103 Effect of Alumina in Phase Formation at the Interface between Titanium and Calcia-Zirconia Composites at 1600°:** *YI-EN SU*<sup>1</sup>; MING-WEI LU<sup>1</sup>; HUAN-TE SU<sup>1</sup>; SHEN-HUNG WEI<sup>1</sup>; CHIEN-CHENG LIN<sup>1</sup>; <sup>1</sup>National Chiao Tung University

**104 Effect of CaZrO<sub>3</sub> Content on the Interfacial Phenomenon between Titanium and Zirconia at 1400°:** *Ming-Wei Lu*<sup>1</sup>; Chien-Cheng Lin<sup>1</sup>; Huan-Te Su<sup>1</sup>; Shen-Hung Wei<sup>1</sup>; <sup>1</sup>National Chiao-Tung University

**105 Effect of Fluorine Incorporation on the Structures and Magnetic Properties of Perovskite and Ruddlesden Popper Ferrates:** *Peter Slater*<sup>1</sup>; Cathryn Hancock<sup>1</sup>; Frank Berry<sup>1</sup>; <sup>1</sup>University of Birmingham

**106 First-Principles Study of Reactive Elements Segregation at Grain Boundaries in Chromia:** *Huazhi Fang*<sup>1</sup>; Zikui Liu<sup>1</sup>; Paul D. Jablonski<sup>2</sup>; <sup>1</sup>The Pennsylvania State University; <sup>2</sup>National Energy Technology Laboratory

**107 Floating-Zone Growth and Characterization of Single Crystals of Transition Metal-Containing Orthosilicates:** *Qi Tang*<sup>1</sup>; Ruediger Dieckmann<sup>1</sup>; <sup>1</sup>Cornell University

**108 Geometrical and Topological Evolution in 3D Grain Coarsening of High Purity Nickel Using High Energy X-ray Diffraction Microscopy:** *S. F. Li*<sup>1</sup>; C. Hefferan<sup>2</sup>; J. Lind<sup>2</sup>; U. Lienert<sup>3</sup>; R. Suter<sup>2</sup>; A. Rollett<sup>4</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Carnegie Mellon University, Department of Physics; <sup>3</sup>Argonne National Lab, Advanced Photon Source; <sup>4</sup>Carnegie Mellon University, Department of Material Science and Engineering

**109 Grain Boundaries in Dense Nanocrystalline Zirconia and Ceria Ceramics: Exclusive Pathways for Proton Conduction at Room Temperature:** *Hugo Avila-Peredes*<sup>1</sup>; Chien-Ting Chen<sup>2</sup>; Shizhong Wang<sup>2</sup>; Roger de Souza<sup>3</sup>; Manfred Martin<sup>3</sup>; Zuhair Munir<sup>2</sup>; Sangtae Kim<sup>2</sup>; <sup>1</sup>Universidad Autonoma Metropolitana; <sup>2</sup>University of California, Davis; <sup>3</sup>RWTH Aachen University

**110 Grain Boundary Character Distributions in Severe Plastic Deformed Pure Cu:** *Hae Jin Lee*<sup>1</sup>; Han Sol Kim<sup>1</sup>; Won Yong Kim<sup>1</sup>; Hyun Taek Son<sup>1</sup>; Kuk Hyun Song<sup>1</sup>; <sup>1</sup>Korea Institute of Industrial Technology



**111 Grain Boundary Electrical Properties of Ge-Doped  $\text{Nd}_4\text{Ga}_2\text{O}_9$ :** *Hirepan Chávez-Cárdenas*<sup>1</sup>; Hugo Avila-Paredes<sup>1</sup>; <sup>1</sup>UAM-I

**112 Grain Growth in Copper, Copper-Titanium, and Titanium Doped Alumina:** *Abigail Lawrence*<sup>1</sup>; <sup>1</sup>Lehigh University

**113 Image Analysis Investigating Porous Structures of Carbon Cathodes Materials and Penetration of Cryolitic Melts:** *Xiang Li*<sup>1</sup>; Jilai Xue<sup>1</sup>; <sup>1</sup>University of Science and Technology Beijing

**114 Improvement of Grain Refining in Severe Plastic Deformed Ni-Cr Alloy:** *Kuk Hyun Song*<sup>1</sup>; Han Sol Kim<sup>1</sup>; Won Yong Kim<sup>1</sup>; <sup>1</sup>Korea Institute of Industrial Technology

**115 Interface Microstructure and Mechanical Properties of Steel/Mg Alloy Multilayered Metal Composites by Infiltration:** *Shoichi Nambu*<sup>1</sup>; Masaki Koba<sup>1</sup>; Junya Inoue<sup>1</sup>; Toshihiko Koseki<sup>1</sup>; Arda Cetin<sup>2</sup>; Andreas Rossoll<sup>2</sup>; Andreas Mortensen<sup>2</sup>; <sup>1</sup>The University of Tokyo; <sup>2</sup>EPFL

**116 Interfacial Phase Effect on Static-Dynamic Mechanical Properties of W-Ni-Fe Heavy Alloy:** *Yong Jin Jeon*<sup>1</sup>; Tae Ho Lee<sup>1</sup>; Se Hoon Kim<sup>1</sup>; Young Do Kim<sup>1</sup>; <sup>1</sup>Hanyang University

**117 Investigation of the Effect of Molybdenum on Microstructure and Mechanical Properties of High Mn Steel Fe-33Mn-3Si-2Al:** *reza razavi*<sup>1</sup>; *Mohsen Saboktakin*<sup>1</sup>; <sup>1</sup>department of materials engineering Islamic azad university, Najafabad Branch, Isfahan, Iran

**118 Ligational Aspects of the Mesogenic Schiff-Base, N,N'-di-(4'-Octadecyloxybenzoate) Salicylidene Diaminoethane, with Some Rare Earth Metal Ions:** *Sanyucta Kumari*<sup>1</sup>; Angad Singh<sup>1</sup>; T. Rao<sup>1</sup>; <sup>1</sup>Banaras Hindu University, Varanasi

**119 Measuring Heterophase Interface Character Distribution (HICD) in Accumulative Roll-Bonded (ARB) Cu-Nb Multilayered Composites:** *Sukbin Lee*<sup>1</sup>; Jonathan LeDonne<sup>1</sup>; Samuel Lim<sup>2</sup>; Irene Beyerlein<sup>3</sup>; Anthony Rollett<sup>1</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Singapore Institute of Manufacturing Technology, A\*STAR Singapore; <sup>3</sup>Los Alamos National Laboratory

**120 Microsecond-Pulsed High Resolution Glow-Discharge Mass Spectrometer for Multielemental Nanometer Scale Depth Resolved Measurements of Thin Layered Structures:** *Glyn Churchill*<sup>1</sup>; *Xinwei Wang*<sup>1</sup>; Karol Putyera<sup>1</sup>; <sup>1</sup>Evans Analytical Group, LLC.

**120 Numerical Simulation of Solidification Structure of 28MnCr5 Gear Steel during the Continuous Casting Process:** *Suzhou Wu*<sup>1</sup>; Zhizheng Li<sup>2</sup>; <sup>1</sup>Wuhan University of Science and Technology; <sup>2</sup>University of Science and Technology Beijing

**122 Oxygen Transport and Oxidation States of B-Site Cations in  $\text{Ba}(\text{Co}, \text{Fe}, \text{Nb})\text{O}_{3-d}$ :** *Jianxin Yi*<sup>1</sup>; Jochen Brendt<sup>1</sup>; *Michael Schroeder*<sup>1</sup>; <sup>1</sup>RWTH Aachen

**123 Power and Gas Pressure Effect on the Properties of Amorphous In-Ga-ZnO Thin Films by Magnetron Sputtering:** *Yuanjie Li*<sup>1</sup>; Xiaofen Hu<sup>1</sup>; Zilong Liu<sup>1</sup>; Jiangbo Ren<sup>1</sup>; <sup>1</sup>Xi'an Jiaotong University

**124 Predicting Grain Boundary Structures and Properties from AB Initio Molecular Dynamics and First-Principles Calculations:** *William Yi Wang*<sup>1</sup>; H.Z. Fang<sup>1</sup>; S.L. Shang<sup>1</sup>; Y. Wang<sup>1</sup>; S. Mathaudhu<sup>2</sup>; Z.K. Liu<sup>1</sup>; <sup>1</sup>Penn State University; <sup>2</sup>US Army Research Office

**125 Quantifying the Effect of Spatial Resolution on the Accuracy of 3-D Feature Characterization:** *Gregory Loughnane*<sup>1</sup>; Ramana Grandhi<sup>1</sup>; Raghavan Srinivasan<sup>1</sup>; Michael Uchic<sup>2</sup>; Michael Groeber<sup>2</sup>; Matthew Riley<sup>3</sup>; Megna Shah<sup>4</sup>; <sup>1</sup>Wright State University; <sup>2</sup>Air Force Research Laboratory; <sup>3</sup>University of Idaho; <sup>4</sup>UES Inc

**126 Residual Compressive Stress Concentrations in Pb-Free Solders:** *Benjamin Anglin*<sup>1</sup>; Wei-Hsun Chen<sup>2</sup>; Pylin Sarobol<sup>2</sup>; RA Lebensohn<sup>3</sup>; AD Rollett<sup>1</sup>; JE Blendell<sup>2</sup>; CA Handwerker<sup>2</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Purdue University; <sup>3</sup>Los Alamos National Laboratory

**127 Structural Aspects and Li Ion Conductivity of Cation Excess Garnets:** *Peter Slater*<sup>1</sup>; Julia Percival<sup>2</sup>; <sup>1</sup>University of Birmingham; <sup>2</sup>University of Surrey

**128 Structural Optimization of Multilayered Barrier Films Using Numerical Simulation:** *Sangil Hyun*<sup>1</sup>; Soojung Kim<sup>1</sup>; Eunhae Koo<sup>1</sup>; Youngsoo Lim<sup>1</sup>; Seung-Hun Huh<sup>1</sup>; <sup>1</sup>Korea Institute of Ceramic Engineering & Technology

**129 Study of Mechanical Deformation of Zr55Cu30Al10Ni5 Bulk Metallic Glass through Instrumented Indentation:** *Mohammad Marvi-Mashhadi*<sup>1</sup>; Abolfazl Rezaee-Bazzaz<sup>1</sup>; Mohsen Haddad-sabzevar<sup>1</sup>; <sup>1</sup>department of material science & engineering, ferdowsi university of mashhad

**130 Synthesis and Characterization of Partially Stabilized Zirconia by Doping with CaO and MgO:** *Pat Nandakumar*<sup>1</sup>; *Elvira Nieto*<sup>1</sup>; <sup>1</sup>University of Texas of Permian Basin

**131 TEM Characterization of the Basal Screw Dislocation in a (0001) Low-Angle Twist Grain Boundary of  $\alpha\text{-Al}_2\text{O}_3$ :** *Eita Tochigi*<sup>1</sup>; Naoya Shibata<sup>1</sup>; Atsutomu Nakamura<sup>2</sup>; Takahisa Yamamoto<sup>1</sup>; Yuichi Ikuhara<sup>1</sup>; <sup>1</sup>The University of Tokyo; <sup>2</sup>Osaka City University

**132 The Characterization of Polypropylene Nanoclay Composite:** *Mohamad Nor Berhan*<sup>1</sup>; Anizah Kalam<sup>1</sup>; <sup>1</sup>UNIVERSITI TEKNOLOGI MARA

**133 The Effect of Heat Treatment on the Mechanical Properties of AZ80 Alloy:** *Ran Liu*<sup>1</sup>; *Jing Tao Wang*<sup>1</sup>; Deliang Yin<sup>1</sup>; <sup>1</sup>Nanjing University of Science and Technology

**134 Thermal Polarization and Characterizations of Polyimide/TiO2 Samples:** *Mulayam Gaur*<sup>1</sup>; *Ram Lal*<sup>2</sup>; <sup>1</sup>Hindustan College of Science and Technology; <sup>2</sup>Pt. J. L. N. Government College

**135 Transference Number Measurements of MIECs: SSC and LSGM:** *Ted Yeh*<sup>1</sup>; Nicola Perry<sup>1</sup>; Thomas Mason<sup>1</sup>; Jules Routbort<sup>2</sup>; <sup>1</sup>Northwestern University; <sup>2</sup>Argonne National Laboratory

## MS&T'11 Poster Session: Iron and Steel

Tuesday AM  
October 18, 2011

Room: Exhibit Hall C  
Location: Columbus Con. Center

**136 Effect of Prestrain and Bake Hardening Heat Treatment on Fracture Toughness and Fatigue Crack Growth Resistance of Two Dual-Phase Steels:** *Leonardo Godefroid*<sup>1</sup>; Warley Horta<sup>1</sup>; Fabiano Machado<sup>2</sup>; Margaret Andrade<sup>3</sup>; <sup>1</sup>Federal University of Ouro Preto; <sup>2</sup>Iochope Maxion S.A.; <sup>3</sup>Centro Tecnológico de Minas Gerais

**137 Effects of Coiling Temperature on the Mechanical Properties and Microstructures of Low Alloy Martensitic Steels:** *Duhan Kim*<sup>1</sup>; Eunji Yu<sup>1</sup>; Sung-Kyung Han<sup>2</sup>; Sung-Ju Kim<sup>2</sup>; Jongryoul Kim<sup>1</sup>; <sup>1</sup>Hanyang University; <sup>2</sup>HYUNDAI STEEL COMPANY

**138 Insulated Sprayed Roll Technique "ISRT" and Solid Shell Resistance of Inner Quality of Continuously Cast Steel Slabs:** *Mostafa El-Bealy*<sup>1</sup>; <sup>1</sup>Ain Shams University, (CC)

**139 Investigation on the Inclusions in the First Slab of Ultralow Carbon Steel:** *Wenjun Duan*<sup>1</sup>; Qichun Peng<sup>1</sup>; <sup>1</sup>Wuhan University of Science and Technology

**140 Kinetic Process of Nozzle Clogging during Continuous Casting of Lower Carbon Al-Killed Steel:** *Suzhou Wu*<sup>1</sup>; <sup>1</sup>Wuhan University of Science and Technology

**141 Numerical Simulation on Influence of Parameters of RH on Decarburization Process for IF Steel:** *Xinyu Zhao*<sup>1</sup>; Jiongming Zhang<sup>1</sup>; <sup>1</sup>University of Science and Technology in Beijing

**142 Optimization of Secondary Cooling Parameters in Continuous Casting Using CAFÉ Model:** *JING Cailiang*<sup>1</sup>; Wang Xinhua<sup>1</sup>; Xu Zhigang<sup>1</sup>; Wang Wanjun<sup>1</sup>; Yin Na<sup>1</sup>; <sup>1</sup>School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

**143 Research of Iron Slag Appearance of Blast Furnace Hearth:** *Qi Chenglin*<sup>1</sup>; Zhang Jianliang<sup>1</sup>; Liu Qinyuan<sup>1</sup>; <sup>1</sup>University of Science and Technology Beijing

**144 Retained Austenite Characteristics and Tensile Properties in TRIP Assisted Steel:** *SANG-WOOK LEE*<sup>1</sup>; <sup>1</sup>HYSKO

**145 Study on the Combustion Process of Pulverized Coal and Carbonaceous Matter Dust in BF:** *Buxin SU*<sup>1</sup>; Jianliang ZHANG<sup>1</sup>; Qinyuan LIU<sup>1</sup>; Xiaomei CHE<sup>1</sup>; Yuandi FU<sup>1</sup>; Jiaqi JIN<sup>1</sup>; <sup>1</sup>University of Science and Technology Beijing

**146 The Influence of Geometrical Factors of the Deformation Zone on Changing for Deformation Shift Degree for the Axial Zone of Rolled High Bars:** *Borys Sereda*<sup>1</sup>; Anton Kovalenko<sup>1</sup>; Dmytro Sereda<sup>1</sup>; Tatjana Vasilchenko<sup>1</sup>; <sup>1</sup>ZSEA

**147 The Variations of Compressive Strength of Containing Carbon Pellets Preheated under Reducing Atmosphere:** *bing dai*<sup>1</sup>; zhe jiang<sup>1</sup>; <sup>1</sup>unversity of science and technology

**148 Thermodynamics Analysis and Control of TiN Precipitation during Solidification of Q345EN Steel:** *Yanzhao Luo*<sup>1</sup>; Jiongming Zhang<sup>1</sup>; Chao Xiao<sup>1</sup>; Zhiming Liu<sup>1</sup>; <sup>1</sup>university of science and technology beijing

**149 Three Dimensional Modeling of Raceway of Dissected Blast Furnace:** *yang guangqing*<sup>1</sup>; zhang jianliang<sup>1</sup>; shao jiugang<sup>1</sup>; chen weiwei<sup>1</sup>; guo hongwei<sup>1</sup>; <sup>1</sup>University of Science and Technology Beijing

## MS&T'11 Poster Session: Materials-Environment Interactions

Tuesday AM  
October 18, 2011

Room: Exhibit Hall C  
Location: Columbus Con. Center

**150 Analysis of Hf-Ta Alloys for Oxidation Protection in Ultra High Temperature Environments:** *Otto Lu-Steffes*<sup>1</sup>; Elizabeth Colon<sup>1</sup>; Ridwan Sakidja<sup>1</sup>; John Perepezko<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

**151 Characterization of the Oxidation Behavior of Nb-20Si-20Cr Alloy:** *Daniel Voglewede*<sup>1</sup>; Shailendra Varma<sup>1</sup>; <sup>1</sup>The University of Texas at El Paso

**152 Comparative Analysis of NiAl Alloys Used as Resistant Coating at High Temperatures Deposited by Powder Flame Spraying and HVOF Process:** Lucas Aguiar<sup>1</sup>; Émillyn Trevisani<sup>1</sup>; André Capra<sup>2</sup>; Helio Padilha<sup>1</sup>; Gustavo Sucharski<sup>1</sup>; Ramón Paredes<sup>1</sup>; <sup>1</sup>Federal University of Paraná; <sup>2</sup>Lactec

**153 Comparative Study of the Deposition of NiCoCrAl Alloys Used as Bond Coat Deposited by HVOF and Air Plasma Spray Processes:** Lucas Aguiar<sup>1</sup>; Gustavo Sucharski<sup>1</sup>; Émillyn Trevisani<sup>1</sup>; André Chicoski<sup>2</sup>; André Capra<sup>2</sup>; Ramón Paredes<sup>1</sup>; <sup>1</sup>Federal University of Paraná; <sup>2</sup>Lactec

**154 Comparison of Oxidation Behavior of Nb-20Si-20Cr-5Hf and Nb-20Si-20Cr-5Al Alloys:** *Brenda Arellano*<sup>1</sup>; Amanda Gutierrez<sup>1</sup>; Alma Vasquez<sup>1</sup>; David Alvarez<sup>1</sup>; Shailendra Varma<sup>1</sup>; <sup>1</sup>The University of Texas at El Paso

**155 Environmental Degradation of Coated Metals:** *severine cambier*<sup>1</sup>; <sup>1</sup>Fontana Corrosion Center

**156 Environmentally Friendly Tin Oxide Coating through Aqueous Solution Process:** Yoshitake Masuda<sup>1</sup>; *Tatsuki Ohji*<sup>1</sup>; Kazumi Kato<sup>1</sup>; <sup>1</sup>National Institute of Advanced Industrial Science and Technology (AIST)

**157 Examination of the Machining Affected Zone in Gamma Titanium Aluminide Machining:** *sajjad kolahdouz*<sup>1</sup>; <sup>1</sup>Amirkabir university of technology

**158 How Coagulant Changes with Corrosion Inhibitors Help Reduce Costly Water Main Breaks:** *Glenn Terrell*<sup>1</sup>; Jason Heberling<sup>1</sup>; Patricia Barron<sup>1</sup>; <sup>1</sup>Birmingham Water Works Board

**159 Oxide Scale Development in Select Alloys from the Nb-Mo-Cr-Si-B System:** *Eduardo Soto*<sup>1</sup>; Katherine Thomas<sup>1</sup>; Benedict Portillo<sup>1</sup>; Shailendra Varma<sup>1</sup>; <sup>1</sup>The University of Texas at El Paso

**160 Protective Coatings for Molybdenum Alloys:** *Travis Sossaman*<sup>1</sup>; Ridwan Sakidja<sup>1</sup>; John Perepezko<sup>1</sup>; <sup>1</sup>University of Wisconsin-Madison

**161 Synthesis and Performance of PGM Modified  $\beta$ NiAl Coatings:** *Kevin Severs*<sup>1</sup>; Pratik Ray<sup>1</sup>; Travis Brammer<sup>1</sup>; Matthew Kramer<sup>1</sup>; Mufit Akin<sup>1</sup>; <sup>1</sup>Ames Laboratory

**162 The Characteristics of High Strength and Lead-Free Machinable  $\alpha$ - $\beta$  Duplex Phase Brass Cu-40Zn-Cr-Fe-Sn-Bi Alloy:** *Haruhiko Atsumi*<sup>1</sup>; Hisashi Imai<sup>1</sup>; Shufeng Li<sup>1</sup>; Katsuyoshi Kondoh<sup>1</sup>; Yoshiharu Kousaka<sup>2</sup>; Akimichi Kojima<sup>2</sup>; <sup>1</sup>osaka university; <sup>2</sup>San-etsu Co., Ltd.

**163 The Mechanism of Metallic Iron Aggregation and Effect of Addition Agent on the Aggregation of Metallic Iron during the Self-Reduction of High Basicity Coal Mixed Briquettes:** zhao dong-nan<sup>1</sup>; *xue zheng-liang*<sup>1</sup>; <sup>1</sup>china

## MS&T'11 Poster Session: Materials Performance

Tuesday AM  
October 18, 2011

Room: Exhibit Hall C  
Location: Columbus Con. Center

**164 Characteristics of Al<sub>0.3</sub>CoCrFeNiC<sub>x</sub> High Entropy Alloys:** Che-Fe Lee<sup>1</sup>; *Tao-Tsung Shun*<sup>1</sup>; <sup>1</sup>Feng Chia University

**165 Characteristics of High Modulus Composite Material for Aerospace Design:** *Ho-Sung Lee*<sup>1</sup>; <sup>1</sup>Korea Aerospace Research Institute

**166 Corrosion Resistance of Pure Ti Processed by High-Ratio Differential Speed Rolling:** *Hye Sung Kim*<sup>1</sup>; <sup>1</sup>Pusan National University

**167 Creep Behavior of Al-Cu Composite Reinforced with Diboride Particles:** *Natalia Cortés-Urrego*<sup>1</sup>; Oscar Suarez<sup>1</sup>; <sup>1</sup>University of Puerto Rico

**168 Dynamic Deformation and Fragmentation Response of Maraging Steel Linear Cellular Alloy:** *Adam Jakus*<sup>1</sup>; D. Fredenburg<sup>1</sup>; T. McCoy<sup>1</sup>; N. Thadhani<sup>1</sup>; J. Cochran<sup>1</sup>; <sup>1</sup>Georgia Institute of Technology

**169 Dynamic Recrystallization Behavior of g/g'-d Eutectic Ni-Base Superalloy during Hot Forging:** *Mengtao Xie*<sup>1</sup>; <sup>1</sup>Illinois Institute of Technology

**170 Effects of Addition of SiC and TiB<sub>2</sub> Particles on Structural and Mechanical Properties of PM Al-Si Foams:** *Mohsen Seifi<sup>1</sup>; Yousef Tabatabaei<sup>1</sup>; S.M.H. Mirbagheri<sup>1</sup>; R. Tafteh<sup>1</sup>; <sup>1</sup>Department of Materials Engineering, Amirkabir University of Technology*

**171 Elaboration and Characterization of Particulate Reinforced Titanium Metal Matrix Composite Using TiH<sub>2</sub> as the Matrix Powder:** *Saunier Sébastien<sup>1</sup>; Jean-Baptiste Fruhauf<sup>1</sup>; Christophe Desrayaud<sup>1</sup>; <sup>1</sup>Ecole des Mines de Saint-Etienne*

**172 Evaluation of the Corrosion Behavior of Laser Welded and GTAW Welded Austenitic Stainless Steel 316L in Lithium Bromide and Comparing the Inhibition Effect of Chromate, Bromate and Molybdate on the Corrosion Behavior of Austenitic Stainless Steel 316L in Lithium Bromide:** *Ahmed Abdel Aziz<sup>1</sup>; Ahmad Momtaz<sup>1</sup>; Ali Al-Warraky<sup>1</sup>; <sup>1</sup>German University in Cairo (GUC)*

**173 Failure Analysis and Improvement of Low Temperature Impact Energy of Q345D Heavy Plates:** *Xian-ying XUE<sup>1</sup>; Feng-jia LIU<sup>1</sup>; Wei-zhao Song<sup>1</sup>; Xin-cheng Wang<sup>1</sup>; Jun Qin<sup>1</sup>; Hu Zhao<sup>1</sup>; <sup>1</sup>Baosteel Group Xinjiang Bayi Iron&Steel Co., Ltd.*

**174 Failure Analysis of Cobalt-Based Seal Pins from Gas Turbines:** *Joanna Siejka-Kulczyk<sup>1</sup>; Marco Innocenti<sup>2</sup>; Jakub Kaczorowski<sup>2</sup>; <sup>1</sup>Warsaw Institute of Aviation; <sup>2</sup>General Electric Oil&Gas*

**175 Fatigue Failures in Threaded Steel Fasteners:** *Mahesh Darji<sup>1</sup>; <sup>1</sup>Square D-Schneider Electric*

**176 High-Temperature Oxidation of Ti-48Al-2Cr-2Nb-(0-1%)W Alloys in Air:** *Min Jung Kim<sup>1</sup>; Dong Bok Lee<sup>1</sup>; Sung June Bong<sup>1</sup>; <sup>1</sup>Sungkyunkwan University*

**177 Influence of Plasma Species on the Surface Properties of Titanium Treated Thermochemically by Plasma N<sub>2</sub>-Ar-O<sub>2</sub>:** *Danilo Braz<sup>1</sup>; Júlio Barbosa<sup>1</sup>; Jussier Vitoriano<sup>1</sup>; Thiago Victor Medeiros<sup>1</sup>; Arlindo Nascimento Neto<sup>1</sup>; Clodomiro Alves Junior<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio grande do Norte*

**178 Influence of Present Species into N<sub>2</sub> – Ar – CH<sub>4</sub> Plasma Mixture on Pieces Made of Ti:** *Júlio Barbosa<sup>1</sup>; Danilo Braz<sup>1</sup>; Antonio Nunes Filho<sup>1</sup>; Ricardo Rocha<sup>1</sup>; Clodomiro Alves Jr.<sup>1</sup>; <sup>1</sup>UFRN*

**179 Structural Characterization of Open-Cell Aluminum Foams by a Sintering-Dissolution Process:** *Carlos Leon-Patino<sup>1</sup>; Ena A. Aguilar-Reyes<sup>1</sup>; Jose M. Tapia-Sanchez<sup>1</sup>; Miguel A. Garcia-Monje<sup>1</sup>; <sup>1</sup>Universidad Michoacana*

**180 Study of the Quality of Calcined Petroleum Coke and Its Influence on the Reduction Process:** *José Subero<sup>1</sup>; <sup>1</sup>CVG Venalum*

**181 Tailored Chemistry of Composites Sintered by Field Assisted Sintering Technology (FAST) for Heat Sink Applications:** *Aaron Rape<sup>1</sup>; Jogender Singh<sup>1</sup>; Anil Kulkarni<sup>2</sup>; <sup>1</sup>Applied Research Lab/Penn State University; <sup>2</sup>Penn State University*

**182 The Effect of Strain Rate and Rolling Direction on Tensile Properties of AZ 31 Magnesium Alloy:** *Ildong Choi<sup>1</sup>; Jihyun Jang<sup>1</sup>; Jiho Kim<sup>1</sup>; Hyungjin Bang<sup>1</sup>; Sihoon Kim<sup>1</sup>; <sup>1</sup>Korea Maritime University*

**183 The Fabrication and Characterization of Carbon Nanotube Sponge with Controllable Pore Size:** *Shih-Chin Chang<sup>1</sup>; Chia-Chi Hsieh<sup>1</sup>; <sup>1</sup>National Tsing Hua University*

**184 The Processing of Aluminum Gasarite Structures through Thermal Decomposition of Titanium Hydride:** *Joseph Licavoli<sup>1</sup>; Paul Sanders<sup>1</sup>; Douglas Swenson<sup>1</sup>; Patrick Bowen<sup>1</sup>; <sup>1</sup>Michigan Technological University*

**185 Wear Behavior of Al-Si / SiCp Metal Matrix Composites:** *Muna Abbas<sup>1</sup>; <sup>1</sup>Dept. of Production Engg.*

**186 Wireline Failures in Oil & Gas Wells - Case Studies:** *Daryoush Masouri<sup>1</sup>; Mehdi Askari<sup>1</sup>; <sup>1</sup>Pars Oil & Gas Co.(POGC)*

## MS&T'11 Poster Session: Nanotechnology

Tuesday AM  
October 18, 2011

Room: Exhibit Hall C  
Location: Columbus Con. Center

**187 A Comparative Study of Electroless Deposition Route Involving Zn and Cu<sup>+</sup> or Cu<sup>2+</sup>:** *Chuncaí Kong<sup>1</sup>; Shaodong Sun<sup>1</sup>; Zhimao Yang<sup>1</sup>; <sup>1</sup>School of Science, MOE Key Laboratory for Non-Equilibrium Synthesis and Modulation of Condensed Matter, Xi'an Jiaotong University*

**188 A Simple Method for the Synthesis of Pt-Ag-Au Alloy Nanoparticles:** *Haidong Zhao<sup>1</sup>; Shengchun Yang<sup>1</sup>; Shengwu Guo<sup>1</sup>; <sup>1</sup>Xi'an Jiaotong University*

**189 Adsorption Thermodynamics of PAA on Ceria Nanoparticles and Its Biocompatibility:** *Shashank Saraf<sup>1</sup>; Amit Kumar<sup>1</sup>; Soumen Das<sup>1</sup>; Ajay Karakoti<sup>2</sup>; Sudipta Seal<sup>1</sup>; <sup>1</sup>AMPAC, NSTC, MMAE, University of Central Florida; <sup>2</sup>EMSL, PNNL*

**190 Analysis of the Key Factors Controlling Sintering of LSM/CGO Multilayer Laminates:** *Vincenzo Esposito<sup>1</sup>; Henrik Frandsen<sup>1</sup>; Rasmus Bjørk<sup>1</sup>; Søren Foghmoes<sup>1</sup>; Kjeld Andersen<sup>1</sup>; Eugene Olevsky<sup>2</sup>; Nini Pryds<sup>1</sup>; <sup>1</sup>Fuel cell and Solid State Chemistry division, Risoe DTU; <sup>2</sup>San Diego State University*

**191 Carbon Nanotube-Assisted Formation of Aluminum Nanoparticles:** *Hye Yun Jeong<sup>1</sup>; Kang Pyo So<sup>1</sup>; Eun Sun Kim<sup>1</sup>; Young Hee Lee<sup>1</sup>; <sup>1</sup>sungkyunkwan University*

**192 Catalyst-Assisted Low Temperature Synthesis of Zinc Oxide Nanostructures by Vapor Phase Transport:** *Michael Marshall<sup>1</sup>; Tarek Trad<sup>1</sup>; <sup>1</sup>University of Texas at Brownsville*

**193 Deformation Mechanism of Nanocrystalline Copper Films during Uniaxial Relaxation Test at Room Temperature:** *Saethavuth Krasienapibal<sup>1</sup>; Shoichi Nambu<sup>1</sup>; Junya Inoue<sup>1</sup>; Toshihiko Koseki<sup>1</sup>; <sup>1</sup>The University of Tokyo*

**194 Effect of Equal Channel Angular Pressing on the Thermal Stability, Microstructure and Mechanical Properties of ETP Copper:** *OSCAR HIGUERA COBOS<sup>1</sup>; JAIRO MUÑOZ BOLAÑOS<sup>1</sup>; PABLO RODRIGUEZ CALVILLO<sup>2</sup>; JOSE CABRERA MARRERO<sup>1</sup>; <sup>1</sup>UNIVERSIDAD POLITÉCNICA DE CATALUÑA; <sup>2</sup>Fundación CTM*

**195 Finite Element Modelling of Copper by Equal Channel Angular Extrusion:** *Arkanti Krishnaiah<sup>1</sup>; K Kumaran<sup>2</sup>; Uday Chakkingal<sup>2</sup>; <sup>1</sup>Osmania University; <sup>2</sup>Indian Institute of Technology Madras*

**196 Hydrothermal Synthesis of Ga<sub>4</sub>Ti<sub>n-4</sub>O<sub>2n-2</sub>:** *Brittany Higgins<sup>1</sup>; Doreen Edwards<sup>1</sup>; <sup>1</sup>Alfred University*

**197 Improving the Wettability of Aluminum on Carbon Nanotubes:** *Kang Pyo So<sup>1</sup>; Il Ha Lee<sup>1</sup>; Dinh Loc Duong<sup>1</sup>; Tae Hyung Kim<sup>1</sup>; Kay Hyeok An<sup>2</sup>; Young Hee Lee<sup>1</sup>; Seong Chu Lim<sup>1</sup>; Eun Sun Kim<sup>1</sup>; <sup>1</sup>Sungkyunkwan University; <sup>2</sup>Chonju machinery research center*

**198 Influence of Growth Condition on Ga and N Co-Doped Zinc Oxide Films and Its Effect on PEC Response for Solar Driven Hydrogen Production:** *Sudhakar Shet<sup>1</sup>; Yanfa Yan<sup>1</sup>; Nuggehalli Ravindra<sup>2</sup>; John Turner<sup>1</sup>; Mowafak Al-Jassim<sup>1</sup>; <sup>1</sup>National Renewable Energy Laboratory; <sup>2</sup>New Jersey Institute of Technology*

**199 Influence of Pressing Temperature on Microstructure Evolution and Mechanical Behavior of Ultrafine-Grained Cu Processed by Equal-Channel Angular Pressing:** *Haiming Wen<sup>1</sup>; Yonghao Zhao<sup>1</sup>; Troy Topping<sup>1</sup>; Dustin Ashford<sup>1</sup>; Roberto Figueiredo<sup>2</sup>; Cheng Xu<sup>3</sup>; Terence Langdon<sup>4</sup>; Enrique Lavernia<sup>1</sup>; <sup>1</sup>University of California, Davis; <sup>2</sup>Universidade Federal de Minas Gerais; <sup>3</sup>Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences; <sup>4</sup>University of Southern California, University of Southampton*

**200 Investigation of the Formation and Extraordinary Thermal Stability of Mg Nano-Grains in Ti<sub>3</sub>AlC-Mg Composites:** Babak Anasori<sup>1</sup>; Michel Barsoum<sup>1</sup>; <sup>1</sup>Drexel University

**201 MgO Tunnel Barrier for Room Temperature Spin Injection and Detection in Semiconductors:** Nathan Gray<sup>1</sup>; Ashutosh Tiwari<sup>1</sup>; <sup>1</sup>University of Utah

**202 Microstructure Exploration of High Strength High Ductility Iron-Based Glassy NanoMaterials:** Sheng Cheng<sup>1</sup>; Alla Sergueeva<sup>1</sup>; Brian Meacham<sup>1</sup>; Daniel Branagan<sup>1</sup>; <sup>1</sup>The Nanosteel Co

**203 Multiwalled Carbon Nanotubes Decorated with Va and Ni by Gamma Irradiation:** Vivek Rao<sup>1</sup>; Jessika Rojas<sup>1</sup>; Carlos Castano<sup>1</sup>; Muthanna Al-Dahhan<sup>1</sup>; <sup>1</sup>Missouri University of Science and Technology

**204 Plasma Sprayed Titanium Oxide-Carbon Nanotube Composite Coating for Dye Sensitized Solar Cells:** Cheng Zhang<sup>1</sup>; Anup Kumar Keshri<sup>1</sup>; Arvind Agarwal<sup>1</sup>; <sup>1</sup>Florida International University

**205 Reversible Ferromagnetic Switching in Undoped and Doped (Co and Mn) ZnO Thin Films:** Siddhartha Mal<sup>1</sup>; Sudhakar Nori<sup>1</sup>; John Prater<sup>2</sup>; Jagdish Narayan<sup>1</sup>; <sup>1</sup>North Carolina State University; <sup>2</sup>Army Research Office

**206 Siloxane Polymer Microspheres Compositing with Nano Silver-Copper Alloy Colloid:** Qunyan Wei<sup>1</sup>; Depeng Zhao<sup>1</sup>; Shixiong Wang<sup>1</sup>; Xiangjun Yang<sup>1</sup>; <sup>1</sup>Yunnan university, School of Chemistry Science and Technology

**207 Site-Specific Texture Analysis of High Pressure Torsion Processed BCC Metals Using Synchrotron Radiation:** Jonathan Ligda<sup>1</sup>; Brian Schuster<sup>2</sup>; Ruslan Valiev<sup>3</sup>; Zenji Horita<sup>4</sup>; Qiuming Wei<sup>1</sup>; <sup>1</sup>UNC Charlotte; <sup>2</sup>Army Research Laboratory; <sup>3</sup>Institute of Physics of Advanced Materials; <sup>4</sup>Kyushu University

**208 Structure of Carbon Nanotubes Grown by Arc-Discharge Technique under Argon, N<sub>2</sub> and O<sub>2</sub> Atmosphere at Different Conditions:** Ghazala Hermiz<sup>1</sup>; Izzat Al-Essa<sup>1</sup>; Ghuson Mohammed<sup>1</sup>; <sup>1</sup>baghdad university-college of science

**209 Synthesis and Characterization of Cobalt Aluminate and Fe<sub>2</sub>O<sub>3</sub> Nanocomposite Electrode for Solar Driven Water Splitting to Produce Hydrogen:** Sudhakar Shet<sup>1</sup>; Kwang-Soon Ahn<sup>2</sup>; Yanfa Yan<sup>1</sup>; Heli Wang<sup>1</sup>; Nuggehalli Ravindra<sup>3</sup>; John Turner<sup>1</sup>; Mowafak Al-Jassim<sup>1</sup>; <sup>1</sup>National Renewable Energy Laboratory; <sup>2</sup>Yeungnam University; <sup>3</sup>New Jersey Institute of Technology

**210 Synthesis and Polymorph Stability of TiO<sub>2</sub>-SnO<sub>2</sub> Nanoparticles Prepared by Pechini Method:** Douglas Gouvêa<sup>1</sup>; Joice Miagava<sup>1</sup>; Annick Rubbens<sup>2</sup>; Pascal Roussel<sup>2</sup>; <sup>1</sup>Universidade de São Paulo; <sup>2</sup>Ecole Nationale Supérieure de Chimie de Lille

**211 Synthesis and Size Distribution Narrowing of Naked Noble Metals Nanoparticles Made in Imidazolium Ionic Liquid:** Miao Shi<sup>1</sup>; Yong Wang<sup>1</sup>; Whitney Shook<sup>1</sup>; Hong Yang<sup>1</sup>; <sup>1</sup>University of Rochester

**212 Tailoring the Relative Si<sub>3</sub>N<sub>4</sub> and SiC Contents in Si<sub>3</sub>N<sub>4</sub>/SiC Nanopowders through Carbothermic Reduction and Nitridation of Silica Fume:** Jyothi Suri<sup>1</sup>; Leon Shaw<sup>1</sup>; <sup>1</sup>University of Connecticut

**213 Thiol-Dependent Cytotoxicity of Zn-Based Quantum Dots:** Sonia Bailon<sup>1</sup>; Oscar Perales-Perez<sup>1</sup>; <sup>1</sup>UPRM

**214 Transport Mechanism of Olfactory Information Using Terpene Sensing Properties of Nanostructured MIP:** Sung Pil Lee<sup>1</sup>; Jaehun Jung<sup>1</sup>; <sup>1</sup>Kyungnam University

**215 Uniform Elongation of Ultra-Fine Grained Steels Evaluated by Micro-Compression Tests:** Takashi Nagoshi<sup>1</sup>; Akinobu Shibata<sup>2</sup>; Masato Sone<sup>1</sup>; Yoshikazu Todaka<sup>3</sup>; <sup>1</sup>Tokyo institute of technology; <sup>2</sup>Kyoto university; <sup>3</sup>Toyohashi university of technology

**216 Using Nanoindentation to Study Residual Stress State and Constitutive Properties in A/B Metallic Multilayer Thin Films:** Michael Gram<sup>1</sup>; Nikolas Antolin<sup>1</sup>; Peter Anderson<sup>1</sup>; <sup>1</sup>Ohio State University

**217 ZnO:GaN Thin Films for Photoelectrochemical Water Splitting Application:** Sudhakar Shet<sup>1</sup>; Yanfa Yan<sup>1</sup>; Heli Wang<sup>1</sup>; Nuggehalli Ravindra<sup>2</sup>; John Turner<sup>1</sup>; Mowafak Al-Jassim<sup>1</sup>; <sup>1</sup>National Renewable Energy Laboratory; <sup>2</sup>New Jersey Institute of Technology

## MS&T'11 Poster Session: Processing and Product Manufacturing

Tuesday AM  
October 18, 2011

Room: Exhibit Hall C  
Location: Columbus Con. Center

**218 ALON Ceramics Prepared by Reactive Spark Plasma Sintering:** Halide Esra Kanbur<sup>1</sup>; Burcu Apak<sup>1</sup>; Filiz Cinar Sahin<sup>1</sup>; <sup>1</sup>Istanbul Technical University

**219 Alumina/Silicon Carbide Nanocomposites: Microwave Sintering:** Argos Colletti<sup>1</sup>; Ruth Kiminami<sup>1</sup>; Guido Link<sup>2</sup>; <sup>1</sup>Universidade Federal de São Carlos; <sup>2</sup>Karlsruhe Institute of Technology

**220 Automatic Controlled Electro-Chemical Machining:** Selis Önel<sup>1</sup>; Gözde Ergin<sup>1</sup>; Mirzahan Hizal<sup>2</sup>; <sup>1</sup>Hacettepe University; <sup>2</sup>Middle East Technical University

**221 Crack Formation Behavior of Chemically Strengthened Soda Lime Glass:** Shusaku Akiba<sup>1</sup>; Akio Koike<sup>1</sup>; Kazutaka Hayashi<sup>1</sup>; Setsuro Ito<sup>2</sup>; <sup>1</sup>ASAHI GLASS CO., LTD.; <sup>2</sup>Tokyo Institute of Technology

**222 Dissimilar Joining of Steels and Aluminum Alloy Pipes for Automobile Applications:** Sungwook Kim<sup>1</sup>; <sup>1</sup>RIST

**223 Effects of Rolling Direction on the Limiting Strains in Mg AZ31B Sheets:** John Curtin<sup>1</sup>; Nicholas Snyder<sup>1</sup>; Fadi Abu-Farha<sup>1</sup>; <sup>1</sup>Penn State Erie

**224 Erosion and Corrosion Resistance of TiAlN/TiN Nanomultilayer and TiAlN-Si<sub>3</sub>N<sub>4</sub> Nanocomposite Coatings in Molten Aluminum Alloy:** Farhad Fazlalipour<sup>1</sup>; Farzad Charani<sup>1</sup>; Nader Shakib<sup>1</sup>; Malahat Niki Nushari<sup>1</sup>; <sup>1</sup>Iran Radiator

**225 Evaluation of Mechanical Properties of 8090 Al-Li Alloy by Equal Channel Angular Pressing Process:** Mohammad Tahmasebi<sup>1</sup>; Mahmood Meratian<sup>1</sup>; Mehrdad Shayan<sup>1</sup>; <sup>1</sup>Isfahan University of Technology

**226 Formation of Aluminum Oxides on Carbon Nanotube Surface via Al<sub>2</sub>O<sub>3</sub>-Carbon Covalent Bonds:** Eun Sun Kim<sup>1</sup>; Kang Pyo So<sup>1</sup>; Hye Yun Jeong<sup>1</sup>; Young Hee Lee<sup>1</sup>; <sup>1</sup>Sungkyunkwan University

**227 Glass transition behavior (ΔT<sub>g</sub> and ΔC<sub>p</sub>) of carbohydrate mixtures:** Matt Sillick<sup>1</sup>; C.M. Gregson<sup>1</sup>; V. Normand<sup>1</sup>; <sup>1</sup>Firmenich



**228 Gradient Testing and Thermo-Mechanical Lifetime Modeling of Fly-Ash Infiltrated Thermal Barrier Coatings for Power-Generating Gas Turbines:** *Andrew Gledhill<sup>1</sup>; Julie Drexler<sup>1</sup>; Kentaro Shinoda<sup>2</sup>; Sanjay Sampath<sup>2</sup>; Nitin Padture<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>Stony Brook University*

**229 Hot Extrudability of Semi Solid AM100A Alloy Fabricated by Cooling Plate:** *Dae-Hwan Kim<sup>1</sup>; Hee-Kyeong Kim<sup>1</sup>; Seung-Hwa Choi<sup>1</sup>; Su-Gun Lim<sup>1</sup>; <sup>1</sup>i-Cube Center, Engineering Research Institute, Gyeongsang National University*

**230 Improving Pump Efficiency and Lowering Life Cycle Cost through Enhanced Ceramic Coatings:** *Doug Klingensmith<sup>1</sup>; <sup>1</sup>Unconventional Solutions Inc.*

**231 Influence of Nanostructural Coatings on Aluminum Soldering/Adhesion Resistance of H13 Hot Work Tool Steel:** *Farhad Fazlalipour<sup>1</sup>; Farzad Charani<sup>1</sup>; Nader Shakib<sup>1</sup>; Malahat Niki Nushari<sup>1</sup>; <sup>1</sup>Iran Radiator*

**232 In-Situ Processing of Alumina Layers by PTA:** *Fabiano Drozda<sup>1</sup>; Sidnei Pianaro<sup>2</sup>; Ana Sofia D'Oliveira<sup>3</sup>; <sup>1</sup>PG-Mec/UFPR; <sup>2</sup>UEPG; <sup>3</sup>UFPR - Federal University of Paraná*

**233 Investigating the Post-Forming Properties of the AZ31B Magnesium Alloy Following Biaxial Stretching:** *Daniel Lowe<sup>1</sup>; Eric Orton<sup>1</sup>; Fadi Abu-Farha<sup>1</sup>; <sup>1</sup>Penn State Erie*

**234 Investigation on Si<sub>3</sub>N<sub>4</sub> Ceramic Foams:** *Yang Jinlong<sup>1</sup>; Yu Juanli<sup>2</sup>; Huang Yong<sup>2</sup>; <sup>1</sup>Tsinghua University ; <sup>2</sup>Tsinghua University*

**235 Investigation on Si<sub>3</sub>N<sub>4</sub> Ceramic Foams:** *Yang Jinlong<sup>1</sup>; <sup>1</sup>Tsinghua University*

**236 Mechanical Behavior of Pure Aluminum Fabricated by Equal Channel Angular Pressing:** *Mohammad Tahmasebi<sup>1</sup>; Mahmood Meratian<sup>1</sup>; Mehrdad Shayan<sup>1</sup>; Mohammad Khaleghifar<sup>1</sup>; <sup>1</sup>Isfahan University of Technology*

**237 Mechanical Properties and Oxidation Behavior of Spark Plasma Sintered ZrB<sub>2</sub>-ZrC-SiC Composites:** *Ipek Akin<sup>1</sup>; Filiz Sahin<sup>1</sup>; Onuralp Yucel<sup>1</sup>; Gultekin Goller<sup>1</sup>; <sup>1</sup>Istanbul Technical University*

**238 Mechanical Properties in Laser-FSW Hybrid Welded Inconel 718 Alloy:** *Kuk Hyun Song<sup>1</sup>; Kazuhiro Nakata<sup>2</sup>; <sup>1</sup>Korea Institute of Industrial Technology; <sup>2</sup>Joining and Welding Research Institute*

**239 Mechanical Properties of Amorphous Carbon Nitride Films According to Deposition Conditions and Post Process:** *Sung Pil Lee<sup>1</sup>; Jaehun Jung<sup>1</sup>; Choon Won Chang<sup>1</sup>; <sup>1</sup>Kyungnam University*

**240 Microwave Sintering of PZT / Fe-Co Nanocomposite Obtained by In Situ Sol-Gel Synthesis:** *Claudia Perdomo<sup>1</sup>; Ducinei Garcia<sup>1</sup>; Ruth Kiminami<sup>1</sup>; <sup>1</sup>Universidade Federal de São Carlos*

**241 Microwave-Assisted Synthesis of B<sub>4</sub>C by Direct H<sub>3</sub>BO<sub>3</sub> Carbo-reduction:** *Rodolfo Klein Gunnewiek<sup>1</sup>; Pollyane Souto<sup>2</sup>; Ruth Kiminami<sup>1</sup>; <sup>1</sup>Federal University of São Carlos - UFSCar; <sup>2</sup>Tecnological Federal University of Paraná - Campus Londrina*

**242 Microwave-Assisted Synthesis of TiC by Carbothermal Reduction:** *Rodolfo Klein Gunnewiek<sup>1</sup>; Pollyane Souto<sup>2</sup>; Ruth Kiminami<sup>1</sup>; <sup>1</sup>Federal University of São Carlos - UFSCar; <sup>2</sup>Tecnological Federal University of Paraná - Campus Londrina*

**243 Multicomponent Saturing of Titan Alloys by SHS:** *Borys Sereda<sup>1</sup>; Yulja Bondarenko<sup>1</sup>; Dmytro Sereda<sup>1</sup>; <sup>1</sup>ZSEA*

**244 Optically Visible Alumina via Spark Plasma Sintering:** *Burcu Apak<sup>1</sup>; Halide Esra Kanbur<sup>1</sup>; Esra Ozkan Zayim<sup>1</sup>; Filiz Cinar Sahin<sup>1</sup>; <sup>1</sup>Istanbul Technical University*

**245 Oxidation Behaviors of Silica Coated Mo-Si-B Alloys:** *Joon Park<sup>1</sup>; Young Song<sup>1</sup>; Jeong Min Kim<sup>1</sup>; Seonghoon Yi<sup>2</sup>; <sup>1</sup>Hanbat National University; <sup>2</sup>Kyungpook National University*

**246 Preparation of Metallic Glass/Metallic Glass Composites Powder by Mechanical Alloying:** *Pee-Yew Lee<sup>1</sup>; <sup>1</sup>National Taiwan Ocean University*

**247 Some Investigations into Ultrasonic Machining of Alumina-Zirconia Ceramic Composite:** *Shrikrushna Bhosale<sup>1</sup>; Raju Pawade<sup>1</sup>; <sup>1</sup>SVERI's College of Engineering*

**248 Synthesis and Characterization of Pure and Cu-Doped SnO<sub>2</sub> Nanoparticles:** *Fermin Aragón<sup>1</sup>; Jose Coaquira<sup>1</sup>; Paulo Moraes<sup>1</sup>; Luciana Guilherme<sup>2</sup>; <sup>1</sup>University of Brasília; <sup>2</sup>Universidade Estadual de Goiás*

**249 The Effect of Postweld Heat Treatment on the Mechanical Properties Microstructures of X70 HSLA Steel:** *M. Hadji<sup>1</sup>; R. Otmani<sup>1</sup>; Tahar Sahraoui<sup>1</sup>; Mostfa Yahi<sup>2</sup>; <sup>1</sup>Universite of Blida; <sup>2</sup>Welding and Control Research Center*

**250 The Researching of Deformational Parameters at Copper Alloys Rolling with Protective Coatings:** *Borys Sereda<sup>1</sup>; Dmytro Krygljak<sup>1</sup>; Irina Krugljak<sup>1</sup>; Dmytro Sereda<sup>1</sup>; <sup>1</sup>ZSEA*

**251 Thermal Gradient Cycling with Simultaneous Silicate Particle Deposition onto Advanced Air Plasma Sprayed Thermal Barrier Coatings:** *Julie Drexler<sup>1</sup>; Andrew Gledhill<sup>1</sup>; Kentaro Shinoda<sup>2</sup>; Sanjay Sampath<sup>2</sup>; Nitin Padture<sup>1</sup>; <sup>1</sup>Ohio State University; <sup>2</sup>Stony Brook University*

**252 Through Thickness Microstructure and Yield Strength of 2A23 Al Alloy during Age Forming Process:** *Shanshan Wang<sup>1</sup>; Liang Zhen<sup>1</sup>; <sup>1</sup>Harbin Institute of Technology*

**253 Real-Time Observation of Soldering of Solder Balls Using SEMWELDER:** *Jeng-O Kim<sup>1</sup>; Jeong Suh<sup>1</sup>; Hee Shin Kang<sup>1</sup>; Jae-Pil Jung<sup>2</sup>; <sup>1</sup>Korea Institute of Machinery & Materials; <sup>2</sup>University of Seoul*



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