Ju Li

Employment

Massachusetts Institute of Technology Cambridge, MA 02139
Battelle Energy Alliance Professor of Nuclear Science and Engineering,
Full Professor (7/2011-present), Department of Nuclear Science and Engineering and Department of Materials Science and Engineering

Tongji University Jiading, Shanghai, China
Adjunct Professor (1/2016-6/2021), Department of Materials Science and Engineering

Xi'an Jiaotong University Xi'an, Shaanxi, China
Adjunct Professor (1/2009-7/2020), School of Materials Science and Engineering

University of Pennsylvania Philadelphia, PA 19104
Associate Professor of Materials Science and Engineering (9/2007-6/2011)

Ohio State University Columbus, OH 43210
Assistant Professor of Materials Science and Engineering (9/2002-9/2007)

Massachusetts Institute of Technology Cambridge, MA 02139
Research scientist (4/2002-9/2002), postdoctoral associate (9/2000-4/2002)
Departments of Nuclear Engineering and Materials Science and Engineering

Education

Massachusetts Institute of Technology Cambridge, MA 02139
Department of Nuclear Engineering (1994-2000) Ph.D., Sept. 2000

University of Science and Technology of China Hefei, Anhui 230026, P.R.C.
Special Class for Gifted Young (1990-1994) B.S. in Physics, 1994

Honors & Awards

Fellow of The Minerals, Metals & Materials Society (2022)

Research.com top scientist (89th in 2022) in materials science:
https://research.com/scientists-rankings/materials-science/us

Fellow of the American Association for the Advancement of Science (2020)

Webometrics $h > 100$ list (global rank 3169 Mar 2022; 3383 Mar 2021; rank 3841 Oct 2020)

Clarivate *Highly Cited Researchers* 2019-2020 in *Cross-Field*, 2018 in *Materials Science* category.

Fellow of the Materials Research Society (2017)

Fellow of the American Physical Society (2014)

Thomson Reuters *Highly Cited Researchers* 2014, among 147 scientists worldwide in Materials Science category based on papers published between 2002-2012, and among "The World's Most Influential Scientific Minds 2014"

Lee Hsun Young Scientist Lecture Series on Materials Science, Institute of Metal Research, Chinese Academy of Sciences (2011)

Chinese Ministry of Education and Li Ka Shing Foundation Chang Jiang Scholar Award (2009)

TMS Robert Lansing Hardy Award (2009)

Technology Review TR35 award (2007)

National Academy of Engineering U.S. Frontiers of Engineering Symposium (Microsoft Research, Sept. 2007) and German-American Frontiers of Engineering Symposium (Oak Ridge, April 2010) co-sponsored by the Alexander von Humboldt Foundation.

Materials Research Society (MRS) 2006 Outstanding Young Investigator Award

Ohio State University College of Engineering Lumley Research Award 2006

Presidential Early Career Award for Scientists and Engineers (PECASE) 2005

Materials Research Society (MRS) Graduate Student Silver Medalist 1998

MIT Nuclear Engineering Department Manson Benedict Fellowship 1996-1997

Service

Author of free molecular visualization software *AtomEye*: http://www.google.com/search?q=AtomEye

Lead Organizer of MIT A+B Applied Energy Symposium, May 22-24, 2019; Aug. 12-14, 2020; with Dr. Zhenhua Rui.

Member of Editorial Board of *Modelling and Simulation in Materials Science and Engineering* (Feb. 2008-), *Nano Research* (Mar. 2008-), *Science China: Technological Sciences* (Jan. 2013-), *Extreme Mechanics Letters* (Aug. 2014-), *Advanced Fiber Materials* (Dec. 2018-), *Engineering* (May 2020-), *Energy Material Advances* (Sept. 2020-), *Journal of Materiomics* (Jan. 2021-), *eScience* (March 2021-).

3-Member Executive Board (Oct. 2010-present) and International Advisory Board (Aug. 2009-present) of Multiscale Materials Modeling (MMM) conference series.

Lead Organizer of 2013 MRS Fall Meeting Symposium YY "*Elastic Strain Engineering for Unprecedented Materials Properties*", and Lead Guest Editor of *MRS Bulletin* February 2014 special issue on Elastic Strain Engineering

Author of multiple perspective articles in *MRS Bulletin*

Issued Patents

7. July 9, 2019: US Patent 10347911, "Lithium hydrogen titanate Li—H—Ti—O material and method for making the same," Zi-Long Tang, Shi-Tong Wang, Zhong-Tai Zhang, Ju Li.

6. July 24, 2018: US Patent 10033034, "Sulfur nanosponge cathode for lithium-sulfur battery and methods of manufacture thereof," Junjie Niu, Akihiro Kushima, Chao Wang, Ju Li.

5. May 29, 2018: US Patent 9985327, "Air secondary battery," Tetsuya Koido, Akihiro Kushima, Yoshiya Fujiwara, Ju Li.

4. April 24, 2018: US Patent 9954262, "Air secondary battery including cathode having trap portion," Tetsuya Koido, Akihiro Kushima, Yoshiya Fujiwara, Ju Li.

3. Nov. 7, 2017: US Patent 9808782, "Optoelectronic devices including twisted bilayers," Ju Li, Xiaofeng Qian, Menghao Wu.

2. Mar 14, 2017: US Patent 9595624 "Strain-engineered bandgaps," Ju Li, Xiaofeng Qian, Ji Feng.

1. Nov.1, 2016: US Patent 9484489 "Engineered band gaps", Ju Li, Xiaofeng Qian, Menghao Wu.

Representative Publications (580+ peer-reviewed papers, 55,000+ SCI cites, h-index 121)[1]

293. Z. Shi, E. Tsymbalov, W-C. Shi, A. Barr, Q-J. Li, J-X. Li, X-Q. Chen, M. Dao, S. Suresh and J. Li, "Phonon stability boundary and deep elastic strain engineering of lattice thermal conductivity," *PNAS* **121** (2024) e2313840121.

292. H-W. Xu, U. Delic, G-Q. Wang, C-H. Li, P. Cappellaro and J. Li, "Exponentially Enhanced Non-Hermitian Cooling," *Physical Review Letters* **132** (2024) 110402.

291. H. Tang, G-Q. Wang, P. Cappellaro and J. Li, "ueV-Deep Neutron Bound States in Nanocrystals," *ACS Nano* (2024) 9063-9070.

290. Y-S. Jung and J. Li, "Boron-10 stimulated helium production and accelerated radiation displacements for rapid development of fusion structural materials," *J. Materiomics* **10** (2024) 377-385.

289. S.Y. Kim, S. Kavak, K.G. Bayrak, C. Sun, H-W. Xu, M.J. Lee, D. Chen, Y. Zhang, E. Tekoglu, D. Agaogullari, E. Ayas, E.S. Park and J. Li, "Demonstration of Helide formation for fusion structural materials as natural lattice sinks for helium," *Acta Materialia* **266** (2024) 119654.

[1] ResearcherID: A-2993-2008 ISI Web of Knowledge search keywords: "Li J" in Author and "nucl same engn same 02139 or mat same 43210 or mat same Univ Penn or 2041 same Columbus" in Address. See also all publications ranked by Google Scholar.

288. A. Abdelhafiz, M.H. Mohammed, J. Abed, D-C. Lee, M-J. Chen, A.S. Helal, Z-C. Ren, F. Alamgir, E. Sargent, P.A. Kohl, S.K. Elsaidi and J. Li, "Tri-Metallic Catalyst for Oxygen Evolution Reaction Enables Continuous Operation of Anion Exchange Membrane Electrolyzer at 1A cm-2 for Hundreds of Hours," *Advanced Energy Materials* (2024) 2303350.

287. T. Defferriere, A.S. Helal, J. Li, J.L.M. Rupp and H.L. Tuller, "Ionic Conduction-Based Polycrystalline Oxide Gamma Ray Detection - Radiation-Ionic Effects," *Advanced Materials* (2024) 2309253.

286. Y. Zhang, Y-H. Dong and J. Li,"Electrochemical shock and transverse cracking in solid electrolytes," *Acta Materialia* **265** (2024) 119620.

285. G-X. Liu, W. Wan, Q. Nie, C. Zhang, X-L. Chen, W-H. Lin, X-Z. Wei, Y-H. Huang, J. Li and C. Wang, "Controllable long-term lithium replenishment for enhancing energy density and cycle life of lithium-ion batteries," *Energy & Environmental Science* **17** (2024) 1163-1174.

284. E. Tekoglu, A.D. O'Brien, J-S. Bae, K-H. Lim, J. Liu, S. Kavak, Y. Zhang, S.Y. Kim, D. Agaogullari, W. Chen, A.J. Hart, G-D. Sim and J. Li, "Metal matrix composite with superior ductility at 800 C: 3D printed In718+ZrB2 by laser powder bed fusion," *Composites Part B* **268** (2024) 111052.

283. S-H. Wang, G-X. Liu, W. Wan, X-Y. Li, J. Li and C. Wang, "Acetamide-Caprolactam Deep Eutectic Solvent-Based Electrolyte for Stable Zn-Metal Batteries," *Advanced Materials* (2023) 2306546.

282. H. Tang, B-N. Li, Y-X. Song, M-R. Liu, H-W. Xu, G-Q. Wang, H-J. Chung and J. Li, "Reinforcement Learning-Guided Long-Timescale Simulation of Hydrogen Transport in Metals," *Advanced Science* (2023) 2304122.

281. Z. Zhang, D-W. Xi, Z-C. Ren and J. Li, "A carbon-efficient bicarbonate electrolyzer," *Cell Reports Physical Science* **4** (2023) 101662.

280. C. Wang, F-Z. Yang, W. Wan, S-H. Wang, Y-Y. Zhang, Y-H. Huang and J. Li, "A large-area lithium metal-carbon nanotube film for precise contact prelithiation in lithium-ion batteries," *Energy & Environmental Science* **16** (2023) 4660-4669.

279. Z-C. Ren, Z. Zhang, Y-S. Tian and J. Li, "CRESt – Copilot for Real-world Experimental Scientist," chemrxiv-2023-tnz1x (2023).

278. Y.J. Park, D. Kaplan, Z-c. Ren, C-W. Hsu, C-H. Li, H-W. Xu, S-P. Li and J. Li, "Can ChatGPT be used to generate scientific hypotheses?" arXiv:2304.12208 (2023).

277. Z-C. Ren, Z-K. Ren, Z. Zhang, T. Buonassisi and J. Li, "Autonomous experiments using active learning and AI," *Nature Reviews Materials* **8** (2023) 563–564.

276. H-W. Xu, H. Tang, G-Q. Wang, C-H. Li, B-N. Li, P. Cappellaro and J. Li, "Solid-state 229Th nuclear laser with two-photon pumping," *Physical Review A* **108** (2023) L021502.

275. Y-H. Dong and J. Li, "Oxygen redox and instability in energy ceramics," *Cell Reports Physical Science* **4** (2023) 101460.

274. G-Q. Wang, A.R. Barr, H. Tang, M. Chen, C-H. Li, H-W. Xu, A. Stasiuk, J. Li and P. Cappellaro, "Characterizing Temperature and Strain Variations with Qubit Ensembles for Their Robust Coherence Protection," *Physical Review Letters* **131** (2023) 043602.

273. G-Q. Wang, C-H. Li, H. Tang, B-N. Li, F. Madonini, F.F. Alsallom, W.K.C. Sun, P. Peng, F. Villa, J. Li and P. Cappellaro, "Manipulating solid-state spin concentration through charge transport," *PNAS* **120** (2023) e2305621120.

272. H. Tang, B-N. Li, G-Q. Wang, H-W. Xu, C-H. Li, A. Barr, P. Cappellaro and J. Li, "Communication-Efficient Quantum Algorithm for Distributed Machine Learning," *Phys. Rev. Lett.* **130** (2023) 150602.

271. H-B. Yang, B-M. Wang, H. Zhang, B. Shen, Y-Y. Li, M. Wang, J-J. Wang, W-S. Gao, Y-M. Kang, L. Li, Y-H. Dong, J-G. Li and J. Li, "Evolving corundum nanoparticles at room temperature," *Acta Materialia* **255** (2023) 119038.

270. Y-S. Niu, Z-L. Hu, B. Zhang, D-D. Xiao, H-C. Mao, L. Zhou, F-X. Ding, Y. Liu, Y. Yang, J-P. Xu, W. Yin, N. Zhang, Z-W. Li, X-Q. Yu, H. Hu, Y-X. Lu, X-H. Rong, J. Li and Y-S. Hu, "Earth-Abundant Na-Mg-Fe-Mn-O Cathode with Reversible Hybrid Anionic and Cationic Redox," *Advanced Energy Materials* (2023) 2300746.

269. Q-J. Li, M.N. Cinbiz, Y. Zhang, Q. He, G. Beausoleil and J. Li, "Robust deep learning framework for constitutive relations modeling," *Acta Materialia* **254** (2023) 118959.

268. Y-C. Chen, Q-J. Li, A.D. O'Brien, Y. Yang, Q. He, D.A. Bloore, J.J. Vlassak and J. Li, "Ion-beam radiation-induced Eshelby transformations: The mean and variance in hydrostatic and shear residual stresses," *Extreme Mechanics Letters* **59** (2023) 101970.

267. J-D. Yu, J. Li, S. Zhang, F. Wei, Y-J. Liu and J-H. Li, "Mechanochemical upcycling of spent LiCoO2 to new LiNi0.80Co0.15Al0.05O2 battery: An atom economy strategy," *PNAS* **118** (2023) e2217698120.

266. A. Abdelhafiz, A.N.M. Tanvir, M-X. Zeng, B-M. Wang, Z-C. Ren, A.R. Harutyunyan, Y-L. Zhang and J. Li, "Pulsed Light Synthesis of High Entropy Nanocatalysts with Enhanced Catalytic Activity and Prolonged Stability for Oxygen Evolution Reaction," *Advanced Science* (2023) 2300426.

265. M-Y. Rao, H. Tang, J-B. Wu, W-H. Song, M. Zhang, W-B. Yin, Y. Zhuo, F. Kiani, B. Chen, X-Q. Jiang, H-F. Liu, H-Y. Chen, R. Midya, F. Ye, H. Jiang, Z-R. Wang, M-C. Wu, M. Hu, H. Wang, Q-F. Xia, N. Ge, J. Li and J.J. Yang, "Thousands of conductance levels in memristors integrated on CMOS," *Nature* **615** (2023) 823.

264. S. Takamoto, D. Okanohara, Q-J. Li and J. Li, "Towards universal neural network interatomic potential," *Journal of Materiomics* **9** (2023) 447-454.

263. H-R. Du, Y-H. Dong, Q-J. Li, R-R. Zhao, X-Q. Qi, W-H. Kan, L-M. Suo, L. Qie, J. Li and Y-H. Huang, "A New Zinc Salt Chemistry for Aqueous Zinc-Metal Batteries," *Adv. Mater.* (2023) 2210055.

262. E. Tekoglu, A.D. O'Brien, J. Liu, B-M. Wang, S. Kavak, Y. Zhang, S.Y. Kim, S-T. Wang, D. Agaogullari, W. Chen, A.J. Hart and J. Li, "Strengthening additively manufactured Inconel 718 through in-situ formation of nanocarbides and silicides," *Additive Manufacturing* **67** (2023) 103478.

261. M.S. Yoon, Y-H. Dong, Y-M. Huang, B-M. Wang, J.H. Kim, J-S. Park, J.S. Hwang, J.H. Park, S.J. Kang, J.P. Cho and J. Li, "Eutectic salt-assisted planetary centrifugal deagglomeration for single-crystalline cathode synthesis," *Nature Energy* **8** (2023) 482–491.

260. J-K. Sung, S.Y. Kim, A. Harutyunyan, M. Amirmaleki, Y-K. Lee, Y-G. Son and J. Li, "Ultra-Thin Lithium Silicide Interlayer for Solid-State Lithium-Metal Batteries," *Advanced Materials* (2023) 2210835.

259. M-T. Huang, M. Schwacke, M. Onen, J. del Alamo, J. Li and B. Yildiz, "Electrochemical Ionic Synapses: Progress and Perspectives," *Advanced Materials* (2023) 2205169.

258. L-C. Huang, D-K. Chen, D-G. Xie, S-Z. Li, Y. Zhang, T. Zhu, D. Raabe, E. Ma, J. Li and Z-W. Shan, "Quantitative tests revealing hydrogen-enhanced dislocation motion in alpha-iron," *Nature Materials* **22** (2023) 710-716.

257. H. Tang, A.R. Barr, G-Q. Wang, P. Cappellaro and J. Li, "First-Principles Calculation of the Temperature-Dependent Transition Energies in Spin Defects," *J. Phys. Chem. Lett.* **14** (2023) 3266-3273.

256. H-W. Xu, G-Q. Wang, C-H. Li, H. Wang, H. Tang, A.R. Barr, P. Cappellaro, and J. Li, "Laser Cooling of Nuclear Magnons," *Physical Review Letters* **130** (2023) 063602.

255. H-W. Xu, C-H. Li, G-Q. Wang, H. Wang, H. Tang, A.R. Barr, P. Cappellaro, and J. Li, "Two-Photon Interface of Nuclear Spins Based on the Optonuclear Quadrupolar Effect," *Physical Review X* **13** (2023) 011017.

254. F-Q. Huang and J. Li, "Surface engineering to prevent oxygen evolution of high-voltage cathodes," *Nature Energy* **8** (2023) 121–122.

253. M-Z. Cai, Y-H. Dong, M. Xie, W-J. Dong, C-L. Dong, P. Dai, H. Zhang, X. Wang, X-Z. Sun, S-N. Zhang, M-S. Yoon, H-W. Xu, Y-S. Ge, J. Li and F-Q. Huang, "Stalling oxygen evolution in high-voltage cathodes by lanthurization," *Nature Energy* **8** (2023) 159-168.

252. S-T. Wang, L-J. Zhao, Y-H. Dong, H. Zhu, Y. Yang, H-W. Xu, B-M. Wang, Y-K. Yuan, Y. Ren, X-J. Huang, W. Quan, Y-T. Li, Y-M. Huang, C.M. Settens, Q. He, Y-W. Sun, H. Wang, Z-Q. Xiao, W-J. Liu, X-H. Xiao, R-Q. Fu, Q. Li, Y.S. Chu, Z-T. Zhang, Q. Liu, A.M. Minor, J-Y. Zhang, Z-L. Tang and J. Li, "Pre-zeolite framework super-MIEC anodes for high-rate lithium-ion batteries," *Energy & Environmental Science* **16** (2023) 241-251.

251. C-Y. Wang, R-Q. Lin, Y-B. He, P-C. Zou, K. Kisslinger, Q. He, J. Li and H. L. Xin, "Tension-Induced Cavitation in Li-Metal Stripping," *Advanced Materials* **35** (2023) 2209091.

250. Y-H. Dong and J. Li, "Oxide Cathodes: Functions, Instabilities, Self Healing, and Degradation Mitigations," *Chemical Reviews* **123** (2022) 811-833.

249. Y-M. Huang and J. Li, "Key Challenges for Grid-Scale Lithium-Ion Battery Energy Storage," *Advanced Energy Materials* **12** (2022) 2202197.

248. Z-K. Liu, Y-H. Dong, X-Q. Qi, R. Wang, Z-L. Zhu, C. Yan, X-P. Jiao, S-P. Li, L. Qie, J. Li and Y-H. Huang, "Stretchable separator/current collector composite for superior battery safety," *Energy & Environmental Science* **15** (2022) 5313-5323.

247. Q. Cheng, T-W. Jin, Y-P. Miao, Z. Liu, J. Borovilas, H-R. Zhang, S-W. Liu, S-Y. Kim, R-W. Zhang, H-Z. Wang, X. Chen, L-Q. Chen, J. Li, W. Min and Y. Yang, "Stabilizing lithium plating in polymer electrolytes by concentration-polarization-induced phase transformation," *Joule* **6** (2022) 2372-2389.

246. R.A. Meidl, M.M. Foss and J. Li, "A Call to Action for Recycling and Waste Management Across the Alternative Energy Supply Chain," Rice University's Baker Institute for Public Policy REPORT (2022) 03.02.22

245. H-W. Xu, S.Y. Kim, D. Chen, J-P. Monchoux, T. Voisin, C. Sun and J. Li, "Materials Genomics Search for Possible Helium-Absorbing Nano-Phases in Fusion Structural Materials," *Advanced Science* (2022) 2203555.

244. Jinwoo Kim, Xiahui Yao, Decheng Kong, Ju Li, Bilge Yildiz and C. Cem Tasan, "Electrochemical pumping: An alternative solution for hydrogen embrittlement," *Applied Materials Today* **29** (2022) 101627.

243. H. Tang, Y. Zhang, Q-J. Li, H-W. Xu, Y-C. Wang, Y-Z. Wang and J. Li, "High accuracy neural network interatomic potential for NiTi shape memory alloy," *Acta Materialia* **238** (2022) 118217.

242. T. Khudiyev, B. Grena, G. Loke, C. Hou, H-J. Jang, J-H. Lee, G.H. Noel, J. Alain, J. Joannopoulos, K. Xu, J. Li, Y. Fink and J.T. Lee, "Thermally drawn rechargeable battery fiber enables pervasive power," *Materials Today* **52** (2022) 80.

241. M. Onen, J. Li, B. Yildiz, and J. A. del Alamo, "Dynamics of PSG-Based Nanosecond Protonic Programmable Resistors for Analog Deep Learning," *International Electron Devices Meeting IEDM* (2022) 10.1109/IEDM45625.2022.10019365.

240. M. Onen, N. Emond, B-M. Wang, D-F. Zhang, F.M. Ross, J. Li, B. Yildiz and J.A. del Alamo, "Nanosecond protonic programmable resistors for analog deep learning," *Science* **377** (2022) 539-543.

239. J-H. Dong, Y-F. Li, Y-Y. Zhou, A. Schwartzman, H-W. Xu, B. Azhar, J. Bennett, J. Li and R. Jaramillo, "Giant and Controllable Photoplasticity and Photoelasticity in Compound Semiconductors," *Physical Review Letters* **129** (2022) 065501.

238. N. Kempf, M. Saeidi-Javash, H-W. Xu, S. Cheng, M. Dubey, Y-Q. Wu, J. Daw, J. Li and Y-L. Zhang, "Thermoelectric power generation in the core of a nuclear reactor," *Energy Conversion and Management* **266** (2022) 115949.

237. A. Abdelhafiz, B-M. Wang, A.R. Harutyunyan and J. Li, "Carbothermal Shock Synthesis of High Entropy Oxide Catalysts: Dynamic Structural and Chemical Reconstruction Boosting the Catalytic Activity and Stability toward Oxygen Evolution Reaction," *Advanced Energy Materials* **12** (2022) 2200742.

236. Y-H. Dong, I-W. Chen and J. Li, "Transverse and Longitudinal Degradations in Ceramic Solid Electrolytes," *Chem. Mater.* **34** (2022) 5749-5765. Published as part of the Virtual Special Issue "John Goodenough at 100".

235. J. Li, "EML webinar overview: Elastic Strain Engineering for unprecedented properties," *Extreme Mechanics Letters* **54** (2022) 101430.

234. X-L. Yang, T-L. Feng, J. Li and X-L. Ruan, "Evidence of fifth- and higher-order phonon scattering entropy of zone-center optical phonons," *Phys. Rev. B* **105** (2022) 115205.

233. H. Wang, X-Y. Tang, H-W. Xu, J. Li and X-F. Qian, "Generalized Wilson loop method for nonlinear light-matter interaction," *npj Quantum Materials* (2022) 61.

232. W-W. Fan, B-M. Wang, R. Gao, G. Dimitrakopoulos, J-Y. Wang, X-H. Xiao, L. Ma, K. Wu, B. Yildiz and J. Li, "Anodic Shock-Triggered Exsolution of Metal Nanoparticles from Perovskite Oxide," *J. Am. Chem. Soc.* **144** (2022) 7657-7666.

231. H-W. Xu, H. Wang and J. Li, "Abnormal nonlinear optical responses on the surface of topological materials," *npj Computational Materials* (2022) 111.

230. Q-Y. Zhang, J-L. Ma, L. Mei, J. Liu, Z-Y. Li, J. Li and Z-Y. Zeng, "In situ TEM visualization of LiF nanosheet formation on the cathode-electrolyte interphase (CEI) in liquid-electrolyte lithium-ion batteries," *Matter* **5** (2022) 1235.

229. Z-Y. Que, Z-C. Wei, X-Y. Li, L. Zhang, Y-H. Dong, M-L. Qin, J-J. Yang, X-H. Qu and J. Li, "Pressureless two-step sintering of ultrafine-grained refractory metals: Tungsten-rhenium and molybdenum," *Journal of Materials Science & Technology* **126** (2022) 203-214.

228. K. Meng, G-Y. Xu, X-H. Peng, K. Youcef-Toumi and J. Li, "Intelligent disassembly of electric-vehicle batteries: a forward-looking overview," *Resources, Conservation and Recycling* **182** (2022) 106207.

227. J-H. Lu, R. Xiong, J-P. Tian, C-X. Wang, C-W. Hsu, N-T. Tsou, F-C. Sun and J. Li, "Battery degradation prediction against uncertain future conditions with recurrent neural network enabled deep learning," *Energy Storage Materials* **50** (2022) 139-151.

226. S-T. Wang, H. Jiang, Y-H. Dong, D. Clarkson, H. Zhu, C.M. Settens, Y. Ren, T. Nguyen, F. Han, W-W. Fan, S.Y. Kim, J-N. Zhang, W-J. Xue, S.K. Sandstrom, G-Y. Xu, E. Tekoglu, M-D. Li, S-L. Deng, Q. Liu, S.G. Greenbaum, X-L. Ji, T. Gao and J. Li, "Acid-in-Clay Electrolyte for Wide-Temperature-Range and Long-Cycle Proton Batteries," *Advanced Materials* (2022) 2202063.

225. W-J. Bian, W. Wu, B-M. Wang, W. Tang, M. Zhou, C-R. Jin, H-P. Ding, W-W. Fan, Y-H. Dong, J. Li and D. Ding, "Revitalizing interface in protonic ceramic cells by acid etch," *Nature* **604** (2022) 479–485.

224. Y. Zhang, Q-J. Li, T. Zhu and J. Li, "Learning constitutive relations of plasticity using neural networks and full-field data," *Extreme Mechanics Letters* **52** (2022) 101645.

223. D. Morgan, G. Pilania, A. Couet, B.P. Uberuaga, C. Sun and J. Li, "Machine learning in nuclear materials research," *Current Opinion in Solid State and Materials Science* **26** (2022) 100975.

222. W-W. Fan, Z-C. Ren, Z. Sun, X-H. Yao, B. Yildiz and J. Li, "Synthesizing Functional Ceramic Powders for Solid Oxide Cells in Minutes through Thermal Shock," *ACS Energy Letters* **7** (2022) 1223-1229.

221. S. Takamoto, S. Izumi and J. Li, "TeaNet: Universal neural network interatomic potential inspired by iterative electronic relaxations," *Computational Materials Science* **207** (2022) 111280.

220. B-Y. Liu, Z. Zhang, F. Liu, N. Yang, B. Li, P. Chen, Y. Wang, J-H. Peng, J. Li, E. Ma and Z-W. Shan, "Rejuvenation of plasticity via deformation graining in magnesium," *Nature Communications* **13** (2022) 1060.

219. B. Han, X-Y. Li, Q. Wang, Y-C. Zou, G-Y. Xu, Y-F. Cheng, Z. Zhang, Y-S. Zhao, Y-H. Deng, J. Li and M. Gu, "Cryo-Electron Tomography of Highly Deformable and Adherent Solid-Electrolyte Interphase Exoskeleton in Li-Metal Batteries with Ether-Based Electrolyte," *Advanced Materials* **34** (2022) 2108252.

218. S.Y. Kim and J. Li, "Machine learning of metal-ceramic wettability," *J. Materiomics* **8** (2022) 195-203.

217. S.Y. Kim and J. Li, "Porous Mixed Ionic Electronic Conductor Interlayers for Solid-State Batteries," *Energy Material Advances* (2021) 1519569.

216. M-H. Wu and J. Li, "Sliding ferroelectricity in 2D van der Waals materials: Related physics and future opportunities," *PNAS* **118** (2021) e2115703118.

215. C-W. Hsu, R. Xiong, N-Y. Chen, J. Li and N-T. Tsou, "Deep neural network battery life and voltage prediction by using data of one cycle only," *Applied Energy* **306** (2022) 118134.

214. S-M. Liu, A. Ishii, S-B. Mi, S. Ogata, J. Li and W-Z. Han, "Dislocation-Mediated Hydride Precipitation in Zirconium," *Small* (2021) 2105881.

213. P-H. Lu, D-G. Xie, B-Y. Liu, F. Ai, Z-R. Zhang, M-S. Jin, X.F. Zhang, E. Ma, J. Li and Z-W. Shan, "Peristalsis-like migration of carbon-metabolizing catalytic nanoparticles," *Extreme Mechanics Letters* **49** (2021) 101463.

212. X-Y. Li, L. Zhang, Y-H. Dong, M-L. Qin, Z-C. Wei, Z-Y. Que, J-J. Yang, X-H. Qu and J. Li, "Towards pressureless sintering of nanocrystalline tungsten," *Acta Materialia* **220** (2021) 117344.

211. X-H. Liu, J.A. Lefever, D-Y. Lee, J. Zhang, R.W. Carpick and J. Li, "Friction and Adhesion Govern Yielding of Disordered Nanoparticle Packings: A Multiscale Adhesive Discrete Element Method Study," *Nano Letters* **21** (2021) 7989-7997.

210. W-J. Xue, R. Gao, Z. Shi, X-H. Xiao, W-X. Zhang, Y-R. Zhang, Y.G. Zhu, I. Waluyo, Y. Li, M.R. Hill, Z. Zhu, S. Li, O. Kuznetsov, Y-M. Zhang, W-K. Lee, A. Hunt, A. Harutyunyan, Y. Shao-Horn, J.A. Johnson and J. Li, "Stabilizing electrode–electrolyte interfaces to realize high-voltage Li//LiCoO2 batteries by a sulfonamide-based electrolyte," *Energy & Environmental Science* **14** (2021) 6030-6040.

209. M. Onen, N. Emond, J. Li, B. Yildiz and J.A. del Alamo, "CMOS-Compatible Protonic Programmable Resistor Based on Phosphosilicate Glass Electrolyte for Analog Deep Learning," *Nano Letters* **21** (2021) 6111–6116.

208. K. Pei, S.Y. Kim and J. Li, "Electrochemically stable lithium-ion and electron insulators (LEIs) for solid-state batteries," *Nano Research* **15** (2022) 1213–1220.

207. P. Li, H-B. Jiang, A. Barr, Z-C. Ren, R. Gao, H. Wang, W-W. Fan, M-F. Zhu, G-Y. Xu and J. Li, "Reusable Polyacrylonitrile-Sulfur Extractor of Heavy Metal Ions from Wastewater," *Advanced Functional Materials* **31** (2021) 2105845.

206. C. Wang, A.S. Helal, Z-Q. Wang, J. Zhou, X-H. Yao, Z. Shi, Y. Ren, J-H. Lee, J-K. Chang, B. Fugetsu and J. Li, "Uranium In Situ Electrolytic Deposition with a Reusable Functional Graphene-Foam Electrode," *Advanced Materials* **33** (2021) 2102633.

205. B. Han, Y-C. Zou, G-Y. Xu, S-G. Hu, Y-Y. Kang, Y-X. Qian, J. Wu, X-M. Ma, J-Q. Yao, T-T. Li, Z. Zhang, H. Meng, H. Wang, Y-H. Deng, J. Li and M. Gu, "Additive stabilization of SEI on graphite observed using cryo-electron microscopy," *Energy & Environmental Science* **14** (2021) 4882-4889.

204. E-Z. Tian, Q-P. Yu, Y-L. Gao, H. Wang, C. Wang, Y-P. Zhang, B-H. Li, M-F. Zhu, J-H. Mo, G-Y. Xu and J. Li, "Ultralow Resistance Two-Stage Electrostatically Assisted Air Filtration by Polydopamine Coated PET Coarse Filter," *Small* (2021) 2102051.

203. H-W. Xu, H. Wang, J. Zhou and J. Li, "Pure spin photocurrent in non-centrosymmetric crystals: bulk spin photovoltaic effect," *Nature Communications* **12** (2021) 4330.

202. H-W. Xu, J. Zhou and J. Li, "Light-Induced Quantum Anomalous Hall Effect on the 2D Surfaces of 3D Topological Insulators," *Advanced Science* **8** (2021) 2101508.

201. E. Tsymbalov, Z. Shi, M. Dao, S. Suresh, J. Li and A. Shapeev, "Machine learning for deep elastic strain engineering of semiconductor electronic band structure and effective mass," *npj Computational Materials* **7** (2021) 76.

200. S. Li, C-A. Wang, F-Q. Yang, L-N. An, K-P. So and J. Li, "Hollow-grained Voronoi foam ceramics with high strength and thermal superinsulation up to 1400C," *Materials Today* **46** (2021) 35-43.

199. S.T. Lam, Q-J. Li, R. Ballinger, C. Forsberg and J. Li, "Modeling LiF and FLiBe Molten Salts with Robust Neural Network Interatomic Potential," *ACS Appl. Mater. Interfaces* **13** (2021) 24582-24592.

198. Q-J. Li, E. Kucukbenli, S. Lam, B. Khaykovich, E. Kaxiras and J. Li, "Development of robust neural-network interatomic potential for molten salt," *Cell Reports Physical Science* **2** (2021) 100359.

197. S.S. Moeini-Ardakani, S.M. Taheri-Mousavi and J. Li, "Highly efficient parallel grand canonical simulations of interstitial-driven diffusion-deformation processes," *Modelling Simul. Mater. Sci. Eng.* **29** (2021) 055018.

196. H-W. Xu, J. Zhou, H. Wang, and J. Li, "Light-induced static magnetization: Nonlinear Edelstein effect," *Physical Review B* **103** (2021) 205417.

195. Y-C. Wang, J. Ding, Z. Fan, L. Tian, M. Li, H-H. Lu, Y-Q. Zhang, E. Ma, J. Li and Z-W. Shan, "Tension-compression asymmetry in amorphous silicon," *Nature Materials* **20** (2021) 1371–1377.

194. M-Y. Li, T. Liu, Z. Shi, W-J. Xue, Y-S. Hu, H. Li, X-J. Huang, J. Li, L-M. Suo and L-Q. Chen, "Dense All-Electrochem-Active Electrodes for All-Solid-State Lithium Batteries," *Advanced Materials* **33** (2021) 2008723.

193. G-Y. Xu, H-B. Jiang, M. Stapelberg, J-W. Zhou, M-Y. Liu, Q-J. Li, Y-T. Cao, R. Gao, M-G. Cai, J-L. Qiao, M.S. Galanek, W-W. Fan, W-J. Xue, B. Marelli, M-F. Zhu and J. Li, "Self-Perpetuating Carbon Foam Microwave Plasma Conversion of Hydrocarbon Wastes into Useful Fuels and Chemicals," *Environmental Science & Technology* **55** (2021) 6239-6247.

192. L. Chen, A.N. Alshawabkeh, S. Hojabri, M. Sun, G-Y. Xu and J. Li, "A Robust Flow-Through Platform for Organic Contaminant Removal," *Cell Reports Physical Science* **2** (2021) 100296.

191. W-B. Li, X-F. Qian and J. Li, "Phase transitions in 2D materials," *Nature Reviews Materials* **6** (2021) 829.

190. J-H. Lee, C. Wang, R. Malik, Y-H. Dong, Y-M. Huang, D-H. Seo and J. Li, "Determining the Criticality of Li-Excess for Disordered-Rocksalt Li-Ion Battery Cathodes," *Advanced Energy Materials* **11** (2021) 2100204.

189. H-M. Fan, S. Li, Y. Yu, H. Xu, M-W. Jiang, Y-H. Huang and J. Li, "Air-Stable LixAl Foil as Free-Standing Electrode with Improved Electrochemical Ductility by Shot-Peening Treatment," *Advanced Functional Materials* **31** (2021) 2100978.

188. B. Han, Z. Zhang, Y-C. Zou, K. Xu, G-Y. Xu, H. Wang, H. Meng, Y-H. Deng, J. Li and M. Gu, "Poor Stability of Li2CO3 in the Solid Electrolyte Interphase of a Lithium-Metal Anode Revealed by Cryo-Electron Microscopy," *Advanced Materials* **33** (2021) 2100404.

187. J. Zhou, H-W. Xu, Y-L. Shi and J. Li, "Terahertz Driven Reversible Topological Phase Transition of Monolayer Transition Metal Dichalcogenides," *Advanced Science* (2021) 2003832.

186. W-J. Xue, M-J. Huang, Y-T. Li, Y.G. Zhu, R. Gao, X-H. Xiao, W-X. Zhang, S-P. Li, G-Y. Xu, Y. Yu, P. Li, J. Lopez, D-W. Yu, Y-H. Dong, W-W. Fan, Z. Shi, R. Xiong, C-J. Sun, I-H. Hwang, W-K. Lee, Y. Shao-Horn, J.A. Johnson and J. Li, "Ultra-high-voltage Ni-rich layered cathodes in practical Li metal batteries enabled by a sulfonamide-based electrolyte," *Nature Energy* **6** (2021) 495–505.

185. Y-Q. Zhang, K. Chen, H. Shen, Y-C. Wang, M.N. Hedhili, X-X. Zhang, J. Li and Z-W. Shan, "Achieving room-temperature M2-phase VO2 nanowires for superior thermal actuation," *Nano Research* **14** (2021) 4146.

184. M-S. Yoon, Y-H. Dong, J-S. Hwang, J-K. Sung, H-Y. Cha, K-H. Ahn, Y-M. Huang, S.J. Kang, J. Li and J-P. Cho, "Reactive boride infusion stabilizes Ni-rich cathodes for lithium-ion batteries," *Nature Energy* **6** (2021) 362–371.

183. R. Gao, M-M. Jin, Q-J. Li, K.P. So, L-F. Zhang, X-P. Wang, Q-F. Fang, C. Sun, L. Shao and J. Li, "Hybrid diffusive-displacive helium outgassing in Cu/Nb multilayer composites," *Scripta Materialia* **194** (2021) 113706.

182. H-W. Xu, H. Wang, J. Zhou, Y-F. Guo, J. Kong and J. Li, "Colossal switchable photocurrents in topological Janus transition metal dichalcogenides," *npj Computational Materials* **7** (2021) 31.

181. X. Xiao, J. Zhou, K-P. Song, J-J. Zhao, Y. Zhou, P.N. Rudd, Y. Han, J. Li and J-S. Huang, "Layer number dependent ferroelasticity in 2D Ruddlesden–Popper organic-inorganic hybrid perovskites," *Nature Communications* **12** (2021) 1332.

180. C-Q. Dang, J-P. Chou, B. Dai, C-T. Chou, Y. Yang, R. Fan, W-T. Lin, F-L. Meng, A. Hu, J-Q. Zhu, J-C. Han, A.M. Minor, J. Li and Y. Lu, "Achieving large uniform tensile elasticity in microfabricated diamond," *Science* **371** (2021) 76-78.

179. H-H. Lu, Z-J. Wang, D. Yun, J. Li and Z-W. Shan, "A new approach of using Lorentz force to study single-asperity friction inside TEM," *Journal of Materials Science & Technology* **84** (2021) 43-48.

178. S.T. Lam, Q-J. Li, J. Mailoa, C. Forsberg, R. Ballinger and J. Li, "The impact of hydrogen valence on its bonding and transport in molten fluoride salts," *Journal of Materials Chemistry A* **9** (2021) 1784.

177. M. Li, B. Hua, L-C. Wang, J.D. Sugar, W. Wu, Y. Ding, J. Li and D. Ding, "Switching of metal-oxygen hybridization for selective CO2 electrohydrogenation under mild temperature and pressure," *Nature Catalysis* **4** (2021) 274-283.

176. Y-H. Dong, Y-M. Huang, D. Ding, W. Wu, X-H. Yao and J. Li, "Chemical and structural origin of hole states in yttria-stabilized zirconia," *Acta Materialia* **203** (2021) 116487.

175. P-H. Cao, K.P. So, Y. Yang, J.G. Park, M-D. Li, L. Yan, J. Hu, M. Kirk, M-M. Li, Y.H. Lee, M.P. Short and J. Li, "Carbon nanotube (CNT) metal composites exhibit greatly reduced radiation damage," *Acta Materialia* **203** (2021) 116483.

174. C-L. Ren, Y. Yang, Y-G. Li, P. Huai, Z-Y. Zhu and J. Li, "Sample spinning to mitigate polarization artifact and interstitial-vacancy imbalance in ion-beam irradiation," *npj Computational Materials* **6** (2020) 189.

173. Z-Q. Wang, X-Y. Li, Y-M. Chen, K. Pei, Y-W. Mai, S-L. Zhang and J. Li, "Creep-Enabled 3D Solid-State Lithium-Metal Battery," *Chem* **6** (2020) 2878-2892.

172. Z. Shi, M. Dao, E. Tsymbalov, A. Shapeev, J. Li and S. Suresh, "Metallization of diamond," *PNAS* **117** (2020) 24634-24639.

171. J-P. Du, W.T. Geng, K. Arakawa, J. Li and S. Ogata, "Hydrogen-Enhanced Vacancy Diffusion in Metals," *Journal of Physical Chemistry Letters* **11** (2020) 7015-7020.

170. J-H. Lee, D-W. Yu, Z. Zhu, X-H. Yao, C. Wang, Y-H. Dong, R. Malik and J. Li, "Kinetic Rejuvenation of Li-Rich Li-Ion Battery Cathodes upon Oxygen Redox," *ACS Applied Energy Materials* **3** (2020) 7931–7943.

169. H-W. Xu, J. Zhou, H. Wang and J. Li, "Giant Photonic Response of Mexican-Hat Topological Semiconductors for Mid-infrared to Terahertz Applications," *Journal of Physical Chemistry Letters* **11** (2020) 6119-6126.

168. J-S. Zhang, Y-N. Liu, H. Yang, Y. Ren, L-S. Cui, D-Q. Jiang, Z-G. Wu, Z-Y. Ma, F-M. Guo, S. Bakhtiari, F. Motazedian and J. Li, "Achieving 5.9% elastic strain in kilograms of metallic glasses: Nanoscopic strain engineering goes macro," *Materials Today* **37** (2020) 18-26.

167. R. Gao, M-M. Jin, F. Han, B-M. Wang, X-P. Wang, Q-F. Fang, Y-H. Dong, C. Sun, L. Shao, M-D. Li and J. Li, "Superconducting Cu/Nb nanolaminate by coded accumulative roll bonding and its helium damage characteristics," *Acta Materialia* **197** (2020) 212-223.

166. Z. Zhu, R. Gao, I. Waluyo, Y-H. Dong, A. Hunt, J-H. Lee and J. Li, "Stabilized Co-Free Li-Rich Oxide Cathode Particles with An Artificial Surface Prereconstruction," *Advanced Energy Materials* **32** (2020) 2001120.

165. Y-M. Huang, Y-H. Dong, S. Li, J-H. Lee, C. Wang, Z. Zhu, W-J. Xue, Y. Li and J. Li, "Lithium Manganese Spinel Cathodes for Lithium-Ion Batteries," *Advanced Energy Materials* **11** (2021) 2000997.

164. J. Duan, Y-H. Zheng, W. Luo, W-Y. Wu, T-R. Wang, Y. Xie, S. Li, J. Li and Y-H. Huang, "Is graphite lithiophobic or lithiophilic?" *National Science Review* **7** (2020) 1208-1217.

163. H. Xu, S. Li, X-L. Chen, C. Zhang, Z-Q. Tang, H-M. Fan, Y. Yu, W-J. Liu, N. Liang, Y-H. Huang and J. Li, "Surpassing lithium metal rechargeable batteries with self-supporting Li-Sn-Sb foil anode," *Nano Energy* **74** (2020) 104815.

162. X-H. Yao, K. Klyukin, W-J. Lu, M. Onen, S-C. Ryu, D-H. Kim, N. Emond, I. Waluyo, A. Hunt, J.A. del Alamo, J. Li and B. Yildiz, "Protonic solid-state electrochemical synapse for physical neural networks," *Nature Communications* **11** (2020) 3134.

161. S.K. Elsaidi, M.H. Mohamed, A.S. Helal, M. Galanek, T. Pham, S. Suepaul, B. Space, D. Hopkinson, P.K. Thallapally and J. Li, "Radiation-resistant metal-organic framework enables efficient separation of krypton fission gas from spent nuclear fuel," *Nature Communications* **11** (2020) 3103.

160. Z. Zhu, D-W. Yu, Z. Shi, R. Gao, X-H. Xiao, I. Waluyo, M-Y. Ge, Y-H. Dong, W-J. Xue, G-Y. Xu, W-K. Lee, A. Hunt and J. Li, "Gradient-morph LiCoO2 single crystals with stabilized energy density above 3400 Wh/L," *Energy & Environmental Science* **13** (2020) 1865-1878.

159. C. Wang, X-P. Zhao, F-F. Liu, Y-M. Chen, X-H. Xia,and J. Li, "Dendrimer-Au Nanoparticle Network Covered Alumina Membrane for Ion Rectification and Enhanced Bioanalysis," *Nano Letters* **20** (2020) 1846-1854.

158. X-Y. Li, L. Zhang, Y-H. Dong, R. Gao, M-L. Qin, X-H. Qu and J. Li, "Pressureless two-step sintering of ultrafine-grained tungsten," *Acta Materialia* **186** (2020) 116-123.

157. Y. Xie, G-Y. Pan, Q. Jin, X-Q. Qi, T. Wang, W. Li, H. Xu, Y-H. Zheng, S. Li, L. Qie, Y-H. Huang and J. Li, "Semi-Flooded Sulfur Cathode with Ultralean Absorbed Electrolyte in Li–S Battery," *Advanced Science* **7** (2020) 1903168.

156. H-M. Fan, B. Chen, S. Li, Y. Yu, H. Xu, M-W. Jiang, Y-H. Huang and J. Li, "Nanocrystalline Li–Al–Mn–Si Foil as Reversible Li Host: Electronic Percolation and Electrochemical Cycling Stability," *Nano Letters* **20** (2020) 896-904.

155. K. Chen, R-Q. Huang, Y. Li, S-C. Lin, W-X. Zhu, N. Tamura, J. Li, Z-W. Shan and E. Ma, "Rafting-Enabled Recovery Avoids Recrystallization in 3D-Printing-Repaired Single-Crystal Superalloys," *Advanced Materials* **32** (2020) 1907164.

154. Y-M. Chen, Z-Q. Wang, X-Y. Li, X-H. Yao, C. Wang, Y-T. Li, W-J. Xue, D-W. Yu, S.Y. Kim, F. Yang, A. Kushima, G-G. Zhang, H-T. Huang, N. Wu, Y-W. Mai, J.B. Goodenough and J. Li, "Li metal deposition and stripping in a solid-state battery via Coble creep," *Nature* **578** (2020) 251-255.

153. W-J. Xue, Z. Shi, M-J. Huang, S-T. Feng, C. Wang, F. Wang, J. Lopez, B. Qiao, G-Y. Xu, W-X. Zhang, Y-H. Dong, R. Gao, Y. Shao-Horn, J.A. Johnson and J. Li, "FSI-inspired solvent and "full fluorosulfonyl" electrolyte for 4 V class lithium-metal batteries," *Energy & Environmental Science* **13** (2020) 212-220.

152. T. Dai, L. Yang, X-H. Ning, D-L. Zhang, R.L. Narayan, J. Li and Z-W. Shan, "A low-cost intermediate temperature Fe/Graphite battery for grid-scale energy storage," *Energy Storage Materials* **25** (2020) 801-810.

151. Y. Yu, S. Li, H-M. Fan, H. Xu, M-W. Jiang, Y-H. Huang and J. Li, "Optimal annealing of Al foil anode for prelithiation and full-cell cycling in Li-ion battery: The role of grain boundaries in lithiation/ delithiation ductility," *Nano Energy* **67** (2020) 104274.

150. W-J. Xue, D-W. Yu, L-M. Suo, C. Wang, Z-Q. Wang, G-Y. Xu, X-H. Xiao, M-Y. Ge, M-S. Ko, Y-M. Chen, L. Qie, Z. Zhu, A.S. Helal, W-K. Lee and J. Li, "Manipulating Sulfur Mobility Enables Advanced Li-S Batteries," *Matter* **1** (2019) 1047-1060.

149. I. Jeon, G.H. Park, P. Wang, J. Li, I.W. Hunter and T.M. Swager, "Dynamic Fluid-Like Graphene with Ultralow Frictional Molecular Bearing," *Adv. Mater.* **31** (2019) 1903195.

148. Z. Zhu, D-W. Yu, Y. Yang, C. Su, Y-M. Huang, Y-H. Dong, I. Waluyo, B-M. Wang, A. Hunt, X-H. Yao, J-H. Lee, W-J. Xue and J. Li, "Gradient Li-rich oxide cathode particles immunized against oxygen release by a molten salt treatment," *Nature Energy* **4** (2019) 1049-1058.

147. J. Zhou, S-H. Zhang and J. Li, "Normal-to-topological insulator martensitic phase transition in group-IV monochalcogenides driven by light," *NPG Asia Materials* **12** (2019) 2.

146. W-J. Xue, D-W. Yu, L-M. Suo, C. Wang, Z-Q. Wang, G-Y. Xu, X-H. Xiao, M-Y. Ge, M-S. Ko, Y-M. Chen, L. Qie, Z. Zhu, A.S. Helal, W-K. Lee and J. Li, "Manipulating Sulfur Mobility Enables Advanced Li-S Batteries," *Matter* **1** (2019) 1047-1060.

145. C. Su, Z-Y. Yin, Q-B. Yan, Z-G. Wang, H-T. Lin, L. Sun, W-S. Xu, T. Yamada, X. Ji, N. Zettsu, K. Teshima, J.H. Warner, M. Dinca, J-J. Hu, M-D. Dong, G. Su, J. Kong and J. Li, "Waterproof molecular monolayers stabilize 2D materials," *PNAS* **116** (2019) 20844-20849.

144. H-W. Xu, J. Zhou, Y-F. Li, R. Jaramillo and J. Li, "Optomechanical control of stacking patterns of h-BN bilayer," *Nano Research* **12** (2019) 2634-2639.

143. X-L. Yang, T-L. Feng, J. Li and X-L. Ruan, "Stronger role of four-phonon scattering than three-phonon scattering in thermal conductivity of III-V semiconductors at room temperature," *Phys. Rev. B* **100** (2019) 245203.

142. M-S. Yoon, Y-H. Dong, Y-B. Yoo, S-J. Myeong, J-S. Hwang, J-H. Kim, S-H. Choi, J-K. Sung, S.J. Kang, J. Li and J-P. Cho, "Unveiling Nickel Chemistry in Stabilizing High-Voltage Cobalt-Rich Cathodes for Lithium-Ion Batteries," *Adv. Funct. Mater.* (2019) 1907903

141. H. Xu, S. Li, C. Zhang, X-L. Chen, W-J. Liu, Y-H. Zheng, Y. Xie, Y-H. Huang and J. Li, "Sn-Alloy Foil Electrode with Mechanical Prelithiation: Full-Cell Performance up to 200 Cycles," *Adv. Energy Mater.* (2019) 1902150.

140. H. Xu, S. Li, C. Zhang, X-L. Chen, W-J. Liu, Y-H. Zheng, Y. Xie, Y-H. Huang and J. Li, "Roll-to-roll prelithiation of Sn foil anode suppresses gassing and enables stable full-cell cycling of lithium ion batteries," *Energy & Environmental Science* **12** (2019) 2991-3000.

139. D-G. Xie, Z-Y. Nie, S. Shinzato, Y-Q. Yang, F-X. Liu, S. Ogata, J. Li, E. Ma and Z-W. Shan, "Controlled growth of single-crystalline metal nanowires via thermomigration across a nanoscale junction," *Nature Communications* **10** (2019) 4478.

138. Y. Liu, G. Liu, H. Xu, Y-H. Zheng, Y-H. Huang, S. Li and J. Li, "Low-temperature synthesized Li4Mn5O12-like cathode with hybrid cation- and anion-redox capacities," *Chemical Communications* **55** (2019) 8118-8121.

137. C. Su, M. Tripathi, Q-B. Yan, Z-G. Wang, Z-H. Zhang, C. Hofer, H-Z. Wang, L. Basile, G. Su, M-D. Dong, J.C. Meyer, J. Kotakoski, J. Kong, J-C. Idrobo, T. Susi and J. Li, "Engineering single-atom dynamics with electron irradiation," *Science Advances* **5** (2019) eaav2252.

136. W-J. Xue, Z. Shi, L-M. Suo, C. Wang, Z-Q. Wang, H-Z. Wang, K.P. So, A. Maurano, D-W. Yu, Y-M. Chen, L. Qie, Z. Zhu, G-Y. Xu, J. Kong and J. Li, "Intercalation-conversion hybrid cathodes enabling Li–S full-cell architectures with jointly superior gravimetric and volumetric energy densities," *Nature Energy* **4** (2019) 374-382.

135. Y-H. Zheng, Y-X. Lu, X-G. Qi, Y-S. Wang, L-Q. Mu, Y-M. Li, Q. Ma, J. Li and Y-S. Hu, "Superior electrochemical performance of sodium-ion full-cell using poplar wood derived hard carbon anode," *Energy Storage Materials* **18** (2019) 269-279.

134. Z. Shi, E. Tsymbalov, M. Dao, S. Suresh, A. Shapeev and J. Li, "Deep elastic strain engineering of bandgap through machine learning," *PNAS* **116** (2019) 4117-4122.

133. P-J. Yang, Q-J. Li, T. Tsuru, S. Ogata, J-W. Zhang, H-W. Sheng, Z-W. Shan, G. Sha, W-Z. Han, J. Li and E. Ma, "Mechanism of hardening and damage initiation in oxygen embrittlement of body-centred-cubic niobium," *Acta Mater.* **168** (2019) 331-342.

132. A.J. Leide, L.W. Hobbs, Z-Q. Wang, D. Chen, L. Shao and J. Li, "The role of chemical disorder and structural freedom in radiation-induced amorphization of silicon carbide deduced from electron spectroscopy and ab initio simulations," *J. Nucl. Mater.* **514** (2019) 299-310.

131. Q. Yang, M-H. Wu and J. Li, "Origin of Two-Dimensional Vertical Ferroelectricity in WTe2 Bilayer and Multilayer," *J. Phys. Chem. Lett.* **9** (2018) 7160-7164.

130. J. Zhou, H-W. Xu, Y-F. Li, R. Jaramillo and J. Li, "Opto-Mechanics Driven Fast Martensitic Transition in Two-Dimensional Materials," *Nano Letters* **18** (2018) 7794-7800.

129. R. Moormann, R.S. Kemp and J. Li, "Caution Is Needed in Operating and Managing the Waste of New Pebble-Bed Nuclear Reactors," *Joule* **2** (2018) 1911-1914.

128. W-W. Xia, Y. Yang, Q-P. Meng, Z-P. Deng, M-X. Gong, J. Wang, D-L. Wang, Y-M. Zhu, L-T. Sun, F. Xu, J. Li and H-L. L. Xin, "Bimetallic Nanoparticle Oxidation in Three Dimensions by Chemically Sensitive Electron Tomography and in Situ Transmission Electron Microscopy," *ACS Nano* **12** (2018) 7866-7874.

127. L. Li, Y-L. Xu, X-F. Sun, R. Chang, Y. Zhang, X-N. Zhang and J. Li, "Fluorophosphates from Solid-State Synthesis and Electrochemical Ion Exchange: NaVPO4F or Na3V2(PO4)2F3?" *Advanced Energy Materials* **8** (2018) 1801064.

126. Y. Yang, A. Kushima, W-Z. Han, H-L. Xin and J. Li, "Liquid-Like, Self-Healing Aluminum Oxide during Deformation at Room Temperature," *Nano Letters* **18** (2018) 2492-2497.

125. Y-G. Yao, Z-N. Huang, P-F. Xie, S.D. Lacey, R.J. Jacob, H. Xie, F-J. Chen, A-M. Nie, T-C. Pu, M. Rehwoldt, D-W. Yu, M.R. Zachariah, C. Wang, R. Shahbazian-Yassar, J. Li and L-B. Hu, "Carbothermal shock synthesis of high-entropy-alloy nanoparticles," *Science* **359** (2018) 1489-1494.

124. K.P. So, A. Kushima, J.G. Park, X-H. Liu, D.H. Keum, H.Y. Jeong, F. Yao, S.H. Joo, H.S. Kim, H. Kim, J. Li and Y.H. Lee, "Intragranular Dispersion of Carbon Nanotubes Comprehensively Improves Aluminum Alloys," *Advanced Science* (2018) 1800115.

123. Q-J. Li, B. Xu, S. Hara, J. Li and E. Ma, "Sample-size-dependent surface dislocation nucleation in nanoscale crystals," *Acta Materialia* **145** (2018) 19-29.

122. L-M. Suo, W-J. Xue, M. Gobet, S.G. Greenbaum, C. Wang, Y-M. Chen, W-L. Yang, Y-X. Li and J. Li, "Fluorine-donating electrolytes enable highly reversible 5V-class Li metal batteries," *PNAS* **115** (2018) 1156-1161.

121. Y. Yang, Y.G. Li, M.P. Short, C-S. Kim, K.K. Berggren and J. Li, "Nano-beam and nano-target effects in ion radiation," *Nanoscale* **10** (2018) 1598-1606.

120. G-Y. Xu, A. Kushima, J-R. Yuan, H. Dou, W-J. Xue, X-G. Zhang, X-H. Yan and J. Li, "Ad hoc Solid Electrolyte on Acidized Carbon Nanotube Paper Improves Cycle Life of Lithium-Sulfur Batteries," *Energy & Environmental Science* **10** (2017) 2544-2551.

119. L-M. Suo, D. Oh, Y-X. Lin, Z-Q. Zhuo, O. Borodin, T. Gao, F. Wang, A. Kushima, Z-Q. Wang, H-C. Kim, Y. Qi, W-L. Yang, F. Pan, J. Li, K. Xu and C-S. Wang, "How Solid-Electrolyte Interphase Forms in Aqueous Electrolytes," *J. Am. Chem. Soc.* **10** (2017) 18670-18680.

118. W-J. Xue, L-X. Miao, L. Qie, C. Wang, S. Li, J-L. Wang and J. Li, "Gravimetric and volumetric energy densities of lithium-sulfur batteries," *Current Opinion in Electrochemistry* **6** (2017) 92-99.

117. S-T. Wang, W. Quan, Z. Zhu, Y. Yang, Q. Liu, Y. Ren, X-Y. Zhang, R. Xu, Y. Hong, Z-T. Zhang, K. Amine, Z-L. Tang, J. Lu and J. Li, "Lithium titanate hydrates with superfast and stable cycling in lithium ion batteries," *Nature Communications* **8** (2017) 627.

116. Y-M. Chen, X-Y. Li, K-S. Park, W. Lu, C. Wang, W-J. Xue, F. Yang, J. Zhou, L-M. Suo, T-Q. Lin, H-T. Huang, J. Li and J.B. Goodenough, "Nitrogen-Doped Carbon for Sodium-Ion Battery Anode by Self-Etching and Graphitization of Bimetallic MOF-Based Composite," *Chem* **3** (2017) 152-163.

115. S-L. Zhang, K-J. Zhao, T. Zhu and J. Li, "Electrochemomechanical degradation of high-capacity battery electrode materials," *Progress in Materials Science* **89** (2017) 479-521.

114. Y-H. Zheng, Y-S. Wang, Y-X. Lu, Y-S. Hu and J. Li, "A high-performance sodium-ion battery enhanced by macadamia shell derived hard carbon anode," *Nano Energy* **39** (2017) 489-498.

113. G-Y. Xu, Q-B. Yan, S-T. Wang, A. Kushima, P. Bai, K. Liu, X-G. Zhang, Z-L. Tang and J. Li, "A thin multifunctional coating on a separator improves the cyclability and safety of lithium sulfur batteries," *Chemical Science* **8** (2017) 6619-6625.

112. W-J. Xue, Q-B. Yan, G-Y. Xu, L-M. Suo, Y-M. Chen, C. Wang, C-A. Wang and J. Li, "Double-oxide sulfur host for advanced lithium-sulfur batteries," *Nano Energy* **38** (2017) 12-18.

111. M-J. Lee, E-S. Lho, P. Bai, S-J. Chae, J. Li and J-P. Cho, "Low-Temperature Carbon Coating of Nanosized Li1.015Al0.06Mn1.925O4 and High-Density Electrode for High-Power Li-Ion Batteries," *Nano Letters* **17** (2017) 3744-3751.

110. W-Z. Han, J. Zhang, M-S. Ding, L. Lv, W-H. Wang, G-H. Wu, Z-W. Shan and J. Li, "Helium Nanobubbles Enhance Superelasticity and Retard Shear Localization in Small-Volume Shape Memory Alloy," *Nano Letters* **17** (2017) 3725-3730.

109. B.Y. Guan, A. Kushima, L. Yu, S. Li, J. Li and X.W. Lou, "Coordination Polymers Derived General Synthesis of Multishelled Mixed Metal-Oxide Particles for Hybrid Supercapacitors," *Advanced Materials* **29** (2017) 1605902.

108. W-B. Li, L. Sun, J-S. Qi, P. Jarillo-Herrero, M. Dinca and J. Li, "High temperature ferromagnetism in pi-conjugated two-dimensional metal–organic frameworks," *Chemical Science* **8** (2017) 2859-2867.

107. K. Liu, P. Bai, M.Z. Bazant, C-A. Wang and J. Li, "A soft non-porous separator and its effectiveness in stabilizing Li metal anodes cycling at 10 mA cm-2 observed in situ in a capillary cell," *Journal of Materials Chemistry A* **5** (2017) 4300-4307.

106. M. Li, D-G. Xie, E. Ma, J. Li, X-X. Zhang and Z-W. Shan, "Effect of hydrogen on the integrity of aluminium-oxide interface at elevated temperatures," *Nature Communications* **8** (2017) 14564.

105. Y. Jin, S. Li, A. Kushima, X-Q. Zheng, Y-M. Sun, J. Xie, J. Sun, W-J. Xue, G-M. Zhou, J. Wu, F-F. Shi, R-F. Zhang, Z. Zhu, K-P. So, Y. Cui and J. Li, "Self-healing SEI enables full-cell cycling of a silicon-majority anode with a coulombic efficiency exceeding 99.9%," *Energy & Environmental Science* **10** (2017) 580-592.

104. A. Kushima, K.P. So, C. Su, P. Bai, N. Kuriyama, T. Maebashi, Y. Fujiwara, M.Z. Bazant and J. Li, "Liquid cell transmission electron microscopy observation of lithium metal growth and dissolution: Root growth, dead lithium and lithium flotsams," *Nano Energy* **32** (2017) 271-279.

103. S-T. Wang, Y. Yang, W. Quan, Y. Hong, Z-T. Zhang, Z-L. Tang and J. Li, "Ti3+-free three-phase Li4Ti5O12/TiO2 for high-rate lithium ion batteries: Capacity and conductivity enhancement by phase boundaries," *Nano Energy* **32** (2017) 294-301.

102. Y.G. Li, Y. Yang, M.P. Short, Z.J. Ding, Z. Zeng and J. Li, "Ion radiation albedo effect: influence of surface roughness on ion implantation and sputtering of materials," *Nuclear Fusion* **57** (2017) 016038.

101. L. Yang, T. Dai, Y-C. Wang, D-G. Xie, R.L. Narayan, J. Li and X-H. Ning, "Chestnut-like SnO2/C nanocomposites with enhanced lithium ion storage properties," *Nano Energy* **30** (2016) 885-891.

100. S-Z. Li, Q-Y. Li, R.W. Carpick, P. Gumbsch, X.Z. Liu, X-D. Ding, J. Sun and J. Li, "The evolving quality of frictional contact with graphene," *Nature* **539** (2016) 541-545.

99. D-G. Xie, S-Z. Li, M. Li, Z-J. Wang, P. Gumbsch, J. Sun, E. Ma, J. Li and Z-W. Shan, "Hydrogenated vacancies lock dislocations in aluminium," *Nature Communications* **7** (2016) 13341.

98. K.P. So, X-H. Liu, H. Mori, A. Kushima, J.G. Park, H.S. Kim, S. Ogata, Y.H. Lee and J. Li, "Ton-scale metal-carbon nanotube composite: The mechanism of strengthening while retaining tensile ductility," *Extreme Mechanics Letters* **8** (2016) 245-250.

97. X-H. Liu, J-F. Gu, Y. Shen and J. Li, "Crystal metamorphosis at stress extremes: how soft phonons turn into lattice defects," *NPG Asia Materials* **8** (2016) e320.

96. J-Y. Zhang, Y-W. Mao, D. Wang, J. Li and Y-Z. Wang, "Accelerating ferroic ageing dynamics upon cooling," *NPG Asia Materials* **8** (2016) e319.

95. Q-J. Li, J. Li, Z-W. Shan and E. Ma, "Surface Rebound of Relativistic Dislocations Directly and Efficiently Initiates Deformation Twinning," *Phys. Rev. Lett.* **117** (2016) 165501.

94. Q-J. Li, J. Li, Z-W. Shan and E. Ma, "Strongly correlated breeding of high-speed dislocations," *Acta Materialia* **119** (2016) 229-241.

93. Z-Q. Liu, Z-Y. Yin, C. Cox, M. Bosman, X-F. Qian, N. Li, H-Y. Zhao, Y-P. Du, J. Li and D.G. Nocera, "Room temperature stable COx-free H2 production from methanol with magnesium oxide nanophotocatalysts," *Science Advances* **2** (2016) e1501425.

92. H-T. Zhang, J. Tersoff, S. Xu, H-X. Chen, Q-B. Zhang, K-L. Zhang, Y. Yang, C-S. Lee, K-N. Tu, J. Li and Y. Lu, "Approaching the ideal elastic strain limit in silicon nanowires," *Science Advances* **2** (2016) e1501382.

91. Z. Zhu, A. Kushima, Z-Y. Yin, L. Qi, K. Amine, J. Lu and J. Li, "Anion-redox nanolithia cathodes for Li-ion batteries," *Nature Energy* **1** (2016) 16111.

90. H. Wang, G-Y. Gou and J. Li, "Ruddlesden-Popper perovskite sulfides A3B2S7: A new family of ferroelectric photovoltaic materials for the visible spectrum," *Nano Energy* **22** (2016) 507-513.

89. K.P. So, D. Chen, A. Kushima, M-D. Li, S-T. Kim, Y. Yang, Z-Q. Wang, J.G. Park, Y.H. Lee, R.I. Gonzalez, M. Kiwi, E.M. Bringa, L. Shao and J. Li, "Dispersion of carbon nanotubes in aluminum improves radiation resistance," *Nano Energy* **22** (2016) 319-327.

88. W-B. Li and J. Li, "Ferroelasticity and domain physics in two-dimensional transition metal dichalcogenide monolayers," *Nature Communications* **7** (2016) 10843.

87. X. Ge, C-D. Gu, Z-Y. Yin, X-L. Wang, J-P. Tu and J. Li, "Periodic stacking of 2D charged sheets: Self-assembled superlattice of Ni–Al layered double hydroxide (LDH) and reduced graphene oxide," *Nano Energy* **20** (2016) 185-193.

86. S-T. Kim, S.J. Choi, K-J. Zhao, H. Yang, G. Gobbi, S-L. Zhang and J. Li, "Electrochemically driven mechanical energy harvesting," *Nature Communications* **7** (2016) 10146.

85. N-Q. Zhang, Z-L. Zhu, H. Xu, X-P. Mao and J. Li, "Oxidation of ferritic and ferritic-martensitic steels in flowing and static supercritical water," *Corrosion Science* **103** (2016) 124-131.

84. W-B. Li and J. Li, "Piezoelectricity in two-dimensional group-III monochalcogenides," *Nano Research* **8** (2015) 3796-3802.

83. A. Kushima, T. Koido, Y. Fujiwara, N. Kuriyama, N. Kusumi and J. Li, "Charging/Discharging Nanomorphology Asymmetry and Rate-Dependent Capacity Degradation in Li-Oxygen Battery," *Nano Letters* **15** (2015) 8260-8265.

82. W. Guo, Z. Wang and J. Li, "Diffusive versus Displacive Contact Plasticity of Nanoscale Asperities: Temperature- and Velocity-Dependent Strongest Size," *Nano Letters* **15** (2015) 6582-6585.

81. S-Z. Li, Y-G. Li, Y-C. Lo, T. Neeraj, R. Srinivasan, X-D. Ding, J. Sun, L. Qi, P. Gumbsch and J. Li, "The interaction of dislocations and hydrogen-vacancy complexes and its importance for deformation-induced proto nano-voids formation in alpha-Fe," *Int. J. Plasticity* **74** (2015) 175-191.

80. D-G. Xie, Z-J. Wang, J. Sun, J. Li, E. Ma and Z-W. Shan, "In situ study of the initiation of hydrogen bubbles at the aluminium metal/oxide interface," *Nature Materials* **14** (2015) 899-903.

79. J. Li, "DISLOCATION NUCLEATION: Diffusive origins," *Nature Materials* **14** (2015) 656-657. News & Views.

78. W-B. Li, J.M. Rieser, A.J. Liu, D.J. Durian and J. Li, "Deformation-driven diffusion and plastic flow in amorphous granular pillars," *Phys. Rev. E* **91** (2015) 062212.

77. X-F. Qian, L. Fu and J. Li, "Topological crystalline insulator nanomembrane with strain-tunable band gap," *Nano Research* **8** (2015) 967-979.

76. C. Wang, X-S. Wang, Y. Yang, A. Kushima, J-T. Chen, Y-H. Huang and J. Li, "Slurryless Li2S/Reduced Graphene Oxide Cathode Paper for High-Performance Lithium Sulfur Battery," *Nano Letters* **15** (2015) 1796-1802.

75. A. Kushima, X-F. Qian, P. Zhao, S.L. Zhang and J. Li, "Ripplocations in van der Waals Layers," *Nano Letters* **15** (2015) 1302-1308.

74. X-F. Qian, J-W. Liu, L. Fu and J. Li, "Quantum spin Hall effect in two-dimensional transition metal dichalcogenides," *Science* **346** (2014) 1344-1347.

73. J. Sun, L-B. He, Y-C. Lo, T. Xu, H-C. Bi, L-T. Sun, Z. Zhang, S. X. Mao and J. Li, "Liquid-like pseudoelasticity of sub-10-nm crystalline silver particles," *Nature Materials* **13** (2014) 1007-1012.

72. J. Li, Z-W. Shan and E. Ma, Guest Editors, "Elastic strain engineering for unprecedented materials properties," *MRS Bulletin* **39** (2014) 108-114.

71. M-H. Wu, X-F. Qian and J. Li, "Tunable Exciton Funnel Using Moire Superlattice in Twisted van der Waals Bilayer," *Nano Letters* **14** (2014) 5350-5357.

70. W-B. Li, H-Y. Fan and J. Li, "Deviatoric Stress-Driven Fusion of Nanoparticle Superlattices," *Nano Letters* **14** (2014) 4951-4958.

69. J-J. Niu, A. Kushima, X-F. Qian, L. Qi, K. Xiang, Y-M. Chiang and J. Li, "In Situ Observation of Random Solid Solution Zone in LiFePO4 Electrode," *Nano Letters* **14** (2014) 4005-4010.

68. P-Y. Zhao, J. Li and Y-Z. Wang, "Extended defects, ideal strength and actual strengths of finite-sized metallic glasses," *Acta Materialia* **73** (2014) 149-166.

67. X-W. Fu, C. Su, Q. Fu, X-L. Zhu, R. Zhu, C-P. Liu, Z-M. Liao, J. Xu, W-L. Guo, J. Feng, J. Li and D-P. Yu, "Tailoring Exciton Dynamics by Elastic Strain-Gradient in Semiconductors," *Advanced Materials* **26** (2014) 2572-2579.

66. B-Y. Liu, J. Wang, B. Li, L. Lu, X-Y. Zhang, Z-W. Shan, J. Li, C-L. Jia, J. Sun and E. Ma, "Twinning-like lattice reorientation without a crystallographic twinning plane," *Nature Communications* **5** (2014) 3297.

65. J.P. Lin, X.D. Li, G.J. Qiao, Z. Wang, J. Carrete, Y. Ren, L.Z. Ma, Y.J. Fei, B.F. Yang, L. Lei and J. Li, "Unexpected High-Temperature Stability of beta-Zn4Sb3 Opens the Door to Enhanced Thermoelectric Performance," *J. Am. Chem. Soc.* **136** (2014) 1497-1504.

64. M. Gu, A. Kushima, Y.Y. Shao, J-G. Zhang, J. Liu, N.D. Browning, J. Li and C.M. Wang, "Probing the Failure Mechanism of SnO2 Nanowires for Sodium-Ion Batteries," *Nano Letters* **13** (2013) 5203-5211.

63. Q. Yu, L. Qi, R.K. Mishra, J. Li and A.M. Minor, "Reducing deformation anisotropy to achieve ultrahigh strength and ductility in Mg at the nanoscale," *PNAS* **110** (2013) 13289-13293.

62. J.Y. Huang, Y-C. Lo, J.J. Niu, A. Kushima, X.F. Qian, L. Zhong, S.X. Mao and J. Li, "Nanowire Liquid Pumps," *Nature Nanotechnology* **8** (2013) 277-281.

61. S.J. Hao, L.S. Cui, D.Q. Jiang, X.D. Han, Y. Ren, J. Jiang, Y.N. Liu, Z.Y. Liu, S.C. Mao, Y.D. Wang, Y. Li, X.B. Ren, X.D. Ding, S. Wang, C. Yu, X.B. Shi, M.S. Du, F. Yang, Y.J. Zheng, Z. Zhang, X.D. Li, D.E. Brown and J. Li, "A Transforming Metal Nanocomposite with Large Elastic Strain, Low Modulus, and High Strength," *Science* **339** (2013) 1191-1194.

60. P.Y. Zhao, J. Li and Y.Z. Wang, "Heterogeneously randomized STZ model of metallic glasses: Softening and extreme value statistics during deformation," *Int. J. Plasticity* **40** (2013) 1-22.

59. J. Feng, X-F. Qian, C-W. Huang and J. Li, "Strain-engineered artificial atom as a broad-spectrum solar energy funnel," *Nature Photonics* **6** (2012) 866-872.

58. A. Kushima, J.Y. Huang and J. Li, "Quantitative fracture strength and plasticity measurements of lithiated silicon nanowires by in situ TEM tensile experiments," *ACS Nano* **6** (2012) 9425-9432.

57. L. Qi and J. Li, "Adsorbate interactions on surface lead to a flattened Sabatier volcano plot in reduction of oxygen," *J. Catalysis* **295** (2012) 59-69.

56. L. Qi, Y.W. Mao and J. Li, "Slip Corona Surrounding Bilayer Graphene Nanopore," *Nanoscale* **4** (2012) 5989-5997.

55. S. Sarkar, J. Li, W.T. Cox, E. Bitzek, T.J. Lenosky and Y.Z. Wang, "Finding activation pathway of coupled displacive-diffusional defect processes in atomistics: Dislocation climb in fcc copper," *Phys. Rev. B* **86** (2012) 014115.

54. X.H. Liu, Y. Liu, A. Kushima, S.L. Zhang, T. Zhu, J. Li and J.Y. Huang, "In Situ TEM Experiments of Electrochemical Lithiation and Delithiation of Individual Nanostructures," *Adv. Energy Mater.* **2** (2012) 722-741.

53. S-W. Nam, H-S. Chung, Y.C. Lo, L. Qi, J. Li, Y. Lu, A.T.C. Johnson, Y. Jung, P. Nukala, R. Agarwal, "Electrical Wind Force-Driven and Dislocation-Templated Amorphization in Phase-Change Nanowires," *Science* **336** (2012) 1561-1566.

52. H. Yang, S. Huang, X. Huang, F.F. Fan, W.T. Liang, X. H. Liu, L-Q. Chen, J. Y. Huang, J. Li, T. Zhu and S.L. Zhang, "Orientation-Dependent Interfacial Mobility Governs the Anisotropic Swelling in Lithiated Silicon Nanowires," *Nano Letters* **12** (2012) 1953-1958.

51. J.S. Qi, X.F. Qian, L. Qi, J. Feng, D.N. Shi and J. Li, "Strain-Engineering of Band Gaps in Piezoelectric Boron Nitride Nanoribbons," *Nano Letters* **12** (2012) 1224-1228.

50. Z-J. Wang, Z-W. Shan, J. Li, J. Sun and E. Ma, "Pristine-to-pristine regime of plastic deformation in submicron-sized single crystal gold particles," *Acta Mater.* **60** (2012) 1368-1377.

49. Q. Yu, L. Qi, K. Chen, R.K. Mishra, J. Li and A.M. Minor, "The Nanostructured Origin of Deformation Twinning," *Nano Letters* **12** (2012) 887-892.

48. L. Tian, Y-Q. Cheng, Z-W. Shan, J. Li, C-C. Wang, X-D. Han, J. Sun and E. Ma, "Approaching the ideal elastic limit of metallic glasses," *Nature Communications* **3** (2012) 609.

47. A. Ishii, S. Ogata, H. Kimizuka and J. Li, "Adaptive-boost molecular dynamics simulation of carbon diffusion in iron," *Phys. Rev. B* **85** (2012) 064303.

46. L. Huang, Q-J. Li, Z-W. Shan, J. Li, J. Sun and E. Ma, "A new regime for mechanical annealing and strong sample-size strengthening in body centred cubic molybdenum," *Nature Communications* **2** (2011) 547.

45. A. Kushima, X. H. Liu, G. Zhu, Z. L. Wang, J.Y. Huang and J. Li, "Leapfrog Cracking and Nanoamorphization of ZnO Nanowires during in Situ Electrochemical Lithiation," *Nano Letters* **11** (2011) 4535-4541.

44. X.H. Liu, H. Zheng, L. Zhong, S. Huang, K. Karki, L.Q. Zhang, Y. Liu, A. Kushima, W.T. Liang, J.W. Wang, J.-H. Cho, E. Epstein, S.A. Dayeh, S.T. Picraux, T. Zhu, J. Li, J.P. Sullivan, J. Cumings, C.S. Wang, S.X. Mao, Z.Z. Ye, S.L. Zhang and J.Y. Huang, "Anisotropic Swelling and Fracture of Silicon Nanowires during Lithiation," *Nano Letters* **11** (2011) 3312-3318.

43. J. Li, S. Sarkar, W. T. Cox, T. J. Lenosky, E. Bitzek and Y.Z. Wang, "Diffusive molecular dynamics and its application to nanoindentation and sintering," *Phys. Rev. B* **84** (2011) 054103.

42. J.S. Qi, J.Y. Huang, J. Feng, D.N. Shi and J. Li, "The Possibility of Chemically Inert, Graphene-Based All-Carbon Electronic Devices with 0.8 eV Gap," *ACS Nano* **5** (2011) 3475-3482.

41. J. Li, A. Kushima, J. Eapen, X. Lin, X.F. Qian, J. C. Mauro, P. Diep and S. Yip, "Computing the Viscosity of Supercooled Liquids: Markov Network Model," *PLoS ONE* **6** (2011) e17909.

40. J. Y. Huang, L. Zhong, C. M. Wang, J. P. Sullivan, W. Xu, L. Q. Zhang, S. X. Mao, N. S. Hudak, X. H. Liu, A. Subramanian, H. Y. Fan, L. Qi, A. Kushima and J. Li, "In situ observation of the electrochemical lithiation of a single SnO2 nanowire electrode," *Science* **330** (2010) 1515-1520.

39. S. Hara and J. Li, "Adaptive strain-boost hyperdynamics simulations of stress-driven atomic processes," *Phys. Rev. B* **82** (2010) 184114.

38. T. Zhu and J. Li, "Ultra-strength materials," *Progress in Materials Science* **55** (2010) 710-757.

37. S. Z. Li, X. D. Ding, J. Li, X. B. Ren, J. Sun and E. Ma, "High-efficiency mechanical energy storage and retrieval using interfaces in nanowires," *Nano Letters* **10** (2010) 1774-1779.

36. L. Qi, J.Y. Huang, J. Feng and J. Li, "*In situ* observations of the nucleation and growth of atomically sharp graphene bilayer edges," *Carbon* **48** (2010) 2354-2360.

35. Q. Yu, Z.-W. Shan, J. Li, X.X. Huang, L. Xiao, J. Sun and E. Ma, "Strong crystal size effect on deformation twinning," *Nature* **463** (2010) 335-338.

34. Y. Wang and J. Li, "Phase Field Modeling of Defects and Deformation," *Acta Mater.* **58** (2010) 1212-1235. Overview No. 150.

33. Y. Mishin, M. Asta and J. Li, "Atomistic modeling of interfaces and their impact on microstructure and properties," *Acta Mater.* **58** (2010) 1117-1151. Overview No. 148.

32. J. Feng, L. Qi, J. Y. Huang and J. Li, "Geometric and electronic structure of graphene bilayer edges," *Phys. Rev. B* **80** (2009) 165407.

31. J. Y. Huang, F. Ding, B. I. Yakobson, P. Lu, L. Qi and J. Li, "In situ observation of graphene sublimation and multi-layer edge reconstructions," *PNAS* **106** (2009) 10103-10108.

30. L. Kovarik, R.R. Unocic, J. Li, P. Sarosi, C. Shen, Y. Wang and M.J. Mills, "Microtwinning and other shearing mechanisms at intermediate temperatures in Ni-based superalloys," *Progress in Materials Science* **54** (2009) 839-873.

29. X-F. Qian, J. Li, L. Qi, C-Z. Wang, T-L. Chan, Y-X. Yao, K-M. Ho and S. Yip, "Quasiatomic orbitals for *ab initio* tight-binding analysis," *Phys. Rev. B* **78** (2008) 245112.

28. S. Suresh and J. Li, "Deformation of the ultra-strong," *Nature* **456** (2008) 716-717.

27. J. Li, T.J. Lenosky, C.J. Först and S. Yip, "Thermochemical and Mechanical Stabilities of the Oxide Scale of ZrB2+SiC and Oxygen Transport Mechanisms," *J. Am. Ceram. Soc.* **91** (2008) 1475-1480.

26. L. Qi, X-F. Qian and J. Li, "Near-neutrality of oxygen molecule adsorbed on Pt(111) surface," *Phys. Rev. Lett.* **101** (2008) 146101.

25. T. Zhu, J. Li, A. Samanta, A. Leach and K. Gall, "Temperature and Strain-Rate Dependence of Surface Dislocation Nucleation," *Phys. Rev. Lett.* **100** (2008) 025502. Cover article.

24. H. Verweij, M. C. Schillo and J. Li, "Fast Mass Transport through Carbon Nanotube Membranes," *Small* **3** (2007) 1996-2004. Concepts article.

23. Y.M. Wang, J. Li, A.V. Hamza and T.W. Barbee, Jr., "Ductile crystalline-amorphous nanolaminates," *PNAS* **104** (2007) 11155-11160.

22. J. Li, P. G. Kevrekidis, C. W. Gear and I. G. Kevrekidis, "Deciding the Nature of the Coarse Equation through Microscopic Simulations: The Baby-Bathwater Scheme," *SIAM Review* **49** (2007) 469-487.

21. J. Li, G. Lykotrafitis, M. Dao and S. Suresh, "Cytoskeletal Dynamics of Human Erythrocyte," *PNAS* **104** (2007) 4937-4942.

20. A. Gouldstone, N. Chollacoop, M. Dao, J. Li, A. Minor and Y.-L. Shen, "Indentation Across Size Scales and Disciplines: Recent Developments in Experimentation and Modeling," *Acta Mater.* **55** (2007) 4015-4039. Overview No. 142.

19. T. Zhu, J. Li, A. Samanta, H.G. Kim and S. Suresh, "Interfacial Plasticity Governs Strain Rate Sensitivity and Ductility in Nanostructured Metals," *PNAS* **104** (2007) 3031-3036. Cover article.

18. J. Li, "The Mechanics and Physics of Defect Nucleation," *MRS Bulletin* **32** (2007) 151-159.

17. J. Eapen, J. Li and S. Yip, "Mechanism of thermal transport in dilute nanocolloids," *Phys. Rev. Lett.* **98** (2007) 028302.

16. F. Shimizu, S. Ogata and J. Li, "Yield Point of Metallic Glass," *Acta Mater.* **54** (2006) 4293-4298.

15. X. Lin, J. Li, C. J. Först and S. Yip, "Multiple Self-Localized Electronic States in Trans-Polyacetylene," *PNAS* **103** (2006) 8943-8946.

14. A. Bongiorno, C.J. Först, R.K. Kalia, J. Li, J. Marschall, A. Nakano, M.M. Opeka, I.G. Talmy, P. Vashishta and S. Yip, "A Perspective on Modeling Materials in Extreme Environments: Oxidation of Ultra-High Temperature Ceramics," *MRS Bulletin* **31** (2006) 410-418.

13. X. Lin, J. Li and S. Yip, "Controlling Bending and Twisting of Conjugated Polymers via Solitons," *Phys. Rev. Lett.* **95** (2005) 198303.

12. J. Li, M. Dao, C. T. Lim and S. Suresh, "Spectrin-level analysis of shape evolution and large deformation elasticity of erythrocyte," *Biophys. J.* **88** (2005) 3707-3719.

11. T. Zhu, J. Li and S. Yip, "Atomistic configurations and energetics of crack extension in silicon," *Phys. Rev. Lett.* **93** (2004) 205504.

10. T. Zhu, J. Li and S. Yip, "Atomistic study of dislocation loop emission from a crack tip," *Phys. Rev. Lett.* **93** (2004) 025503.

9. J. Li, A.H.W. Ngan and P. Gumbsch, "Atomistic modeling of mechanical behavior," *Acta Mater.* (Golden Jubilee Issue) **51** (2003) 5711-42.

8. N.H. de Leeuw, Z.M. Du, J. Li, S. Yip and T. Zhu, "Computer modeling study of the effect of hydration on the stability of a silica nanotube," *Nano Letters* **3** (2003) 1347-52.

7. J. Li, "AtomEye: an efficient atomistic configuration viewer," *Modelling Simul. Mater. Sci. Eng.* **11** (2003) 173-7.

6. S. Ogata, J. Li and S. Yip, "Ideal pure shear strength of aluminum and copper," *Science* **298** (2002) 807-11.

5. J. Li, K.J. Van Vliet, T. Zhu, S. Yip and S. Suresh, "Atomistic mechanism governing elastic limit and incipient plasticity in crystals," *Nature* **418** (2002) 307-10.

4. W. Cai, V.V. Bulatov, J.-P. Chang, J. Li and S. Yip, "Anisotropic elastic interactions of a periodic dislocation array," *Phys. Rev. Lett.* **86** (2001) 5727-30.

3. J. Li, L.J. Porter and S. Yip, "Atomistic modeling of finite-temperature properties of crystalline β-SiC: II. thermal conductivity and effects of point defects," *J. Nucl. Mater.* **255** (1998) 139-52.

2. J. Li, D.Y. Liao and S. Yip, "Coupling continuum to molecular-dynamics simulation: reflecting particle method and the field estimator," *Phys. Rev. E* **57** (1998) 7259-67.

1. J.H. Wang, J. Li, S. Yip, S. Phillpot and D. Wolf, "Mechanical instabilities of homogeneous crystals," *Phys. Rev. B* **52** (1995) 12627-35.