

# 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 Engi-  
neering

*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 (590+ peer-reviewed papers, 57,000+ SCI cites, h-index 123)<sup>1</sup>

296. Y-C. Wang, X-D. Wang, J. Ding, B-M. Liang, L-L. Zuo, S-C. Zheng, L-C. Huang, W. Xu, C-W. Fan, Z-Q. Duan, C-D. Jia, R. Zheng, Z. Liu, W. Zhang, J. Li, E. Ma and Z-W. Shan, “Inward motion of diamond nanoparticles inside an iron crystal,” *Nature Communications* **15** (2024) 4659.
295. P. Zguns, N. Gedik, B. Yildiz and J. Li, “Superconductivity and Pronounced Electron-Phonon Coupling in Rock-Salt  $\text{Al}_{1-x}\text{O}_{1-x}$  and  $\text{Ti}_{1-x}\text{O}_{1-x}$ ,” *Advanced Electronic Materials* (2024) 2400141.
294. R-J. Yang, L. Mei, Z-Y. Lin, Y-Y. Fan, J-W. Lim, J-H. Guo, Y-J. Liu, H.S. Shin, D. Voiry, Q-Y. Lu, J. Li and Z-Y. Zeng, “Intercalation in 2D materials and in situ studies,” *Nature Reviews Chemistry* **8** (2024) 410-432.
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.

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<sup>1</sup>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  
AD Scientific Index: <https://www.adscientificindex.com/scientist/ju-li/1324670>

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, “ $\mu$ eV-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.
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<sup>-2</sup> 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 In<sub>718</sub>+ZrB<sub>2</sub> 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?” *J. Materiomics* **10** (2024) 578-584.
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  $^{229}\text{Th}$  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  $\text{LiCoO}_2$  to new  $\text{LiNi}_{0.80}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_2$  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 lanthanization,” *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.
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