

## KEJIE ZHAO

Professor of Mechanical Engineering  
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### ACADEMIC APPOINTMENTS

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08/2023 – present: Professor of Mechanical Engineering, Purdue University.  
 08/2020 – 08/2023: Associate Professor of Mechanical Engineering, Purdue University.  
 08/2014 – 08/2020: Assistant Professor of Mechanical Engineering, Purdue University.

### PROFESSIONAL PREPARATION

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09/2012 – 07/2014: Postdoctoral Associate, Massachusetts Institute of Technology.  
 Advisor: Ju Li  
 09/2008 – 06/2012: PhD in Engineering Sciences, Harvard University.  
 Advisors: Zhigang Suo, Joost Vlassak  
 09/2008 – 06/2010: Master in Applied Physics, Harvard University.  
 09/2005 – 07/2008: Master in Engineering Sciences, Xi'an Jiaotong University, China.  
 Advisor: Changqing Chen.  
 09/2001 – 07/2005: Bachelor in Engineering Sciences, Xi'an Jiaotong University, China.

### AWARDS

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1. Haythornthwaite Research Initiation Grants, Applied Mechanics Division, ASME, 2014.
2. Purdue IMPACT: Transformative teaching of Mechanics of Materials, 2016.
3. 3M Non-Tenured Faculty Award, 2016.
4. *Extreme Mechanics Letters* Young Investigator Award, 2016.
5. Purdue Teaching for Tomorrow Fellowship, 2017.
6. Seed for Success Acorn Award, Purdue University, 2017.
7. *Energy Storage Materials* Young Scientist Award, 2019.
8. NSF CAREER Award, 2020.
9. James W. Dally Young Investigator Award, Society for Experimental Mechanics, 2021.
10. ASME Fellow, 2021.
11. B.F.S. Schaefer Scholar, Purdue University, 2022-2024.
12. University Faculty Scholar, Purdue University, 2024-2029.
13. A. J. Durelli Award, Society for Experimental Mechanics, 2025.
14. Gustus L. Larson Memorial Award, ASME, 2025.

### KEY PAPERS ([Google Scholar](#) Citation>10000, H-index: 61)

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1. Rong Xu<sup>G</sup>, Yang Yang, Fei Yin, Pengfei Liu<sup>G</sup>, Peter Cloetens, Yijin Liu, Feng Lin, **Kejie Zhao**<sup>#</sup>. Heterogeneous damage in Li-ion batteries: Experimental analysis and theoretical modeling. *Journal of the Mechanics and Physics of Solids*. 129, 160-183 (2019).  
 This paper represents Zhao's development of computational modeling of multiphysics and damage.

- Luize Scalco de Vasconcelos<sup>G</sup>, Rong Xu<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. Quantitative spatiotemporal Li profiling using nanoindentation. *Journal of the Mechanics and Physics of Solids*. 144, 104102 (2020).

This paper represents Zhao's development of operando nanoindentation experiments for materials subject to electrochemical load. His development of the new experimental method was recognized by the A. J. Durelli Award from the Society for Experimental Mechanics.

- Jizhou Li<sup>†</sup>, Nikhil Sharma<sup>G†</sup>, Zhisen Jiang, Yang Yang, Federico Monaco, Zhengrui Xu, Daniel Ratner, Piero Pianetta, Peter Cloetens, Feng Lin<sup>#</sup>, **Kejie Zhao**<sup>#</sup>, Yijin Liu<sup>#</sup>. Dynamics of particle network in composite battery cathodes. *Science*. 376, 517-521 (2022).

This paper represents Zhao's work to chart the dynamics of particle network, which shifts the perspective from single-particle behaviors to the collective behavior of particle group to understanding the system performance.

- Xiaokang Wang<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. A continuum theory of organic mixed ionic-electronic conductors of phase separation. *Journal of the Mechanics and Physics of Solids*. 172, 105178 (2023).

This paper represents Zhao's theoretical development to describe conducting polymers subject to concurrent mechanical load, electrostatics, charge conduction, ion transport, and phase separation.

- Aishwary Shrivastava<sup>G†</sup>, Nikhil Sharma<sup>G†</sup>, Xiaomei He<sup>G†</sup>, Yijin Liu, **Kejie Zhao**<sup>#</sup>. On the scale of heterogeneity in composite electrodes of batteries. *PNAS*. 122, e2520136122 (2025).

This work represents Zhao's newest development of optical microscopy to measure the local electrochemistry of particle-network materials. This work proves the theoretical relationship between the optical properties of metal-oxide particles and Li composition, and determines the scale of heterogeneity which bridges the particle behavior and system performance of batteries.

## MENTORING

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- 9 PhD graduates: Rong Xu (12/2018), Hong Sun (10/2020), Luize Vasconcelos (12/2020), Xianyang Wu (10/2021), Sen Xiang (07/2022), Xiaokang Wang (05/2023), Nikhil Sharma (07/2023), Jiaxiu Han (06/2025), Sameep Rajubhai Shah (06/2025).
- Currently advising 6 PhD students and 1 postdoc.
- 19 student awards (see Appendix).

## TEACHING

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- Regularly teach Mechanics of Materials (junior level), Statics (sophomore level), and Solid Mechanics I (graduate level, Zhao developed). Average class size – 60 students. Average teaching evaluation – 4.4/5 (see Appendix).
- Outstanding Engineering Teacher (×3, top 25% in teaching evaluation in College of Engineering).
- Publication: Hyun Jin Cho<sup>#</sup>, **Kejie Zhao**<sup>#</sup>, Cho Rong Lee, Debra Runshe, Chuck Krousgrill. Active learning through flipped classroom in mechanical engineering: Improving students' perception of learning and performance. *International Journal of STEM Education*. 8, 46 (2021).

This article addresses the challenges of active learning that large lecture-focused courses have faced in higher education and quantitatively evaluates the flipped classroom model implemented by Zhao at Purdue University. This scholastic article highlights the benefits of and future direction for implementing the flipped classroom in the traditional mechanical engineering courses. This paper has been cited over 200 times.

#### **MAJOR SERVICE**

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1. Associate Editor, *Applied Mechanics Reviews*, 2024-present.
2. Technical Editor, *Experimental Mechanics*, 2025-present.
3. Board of Directors, Society of Engineering Science, 2021-2025.
4. General co-chair – Society of Engineering (SES) Annual Meeting (Virtual), 10/2021, (SES Virtual Month).
5. General co-chair – Society of Engineering (SES) Annual Meeting, 10/2026, Purdue University.
6. Research committee, Society for Experimental Mechanics, 2025-present.
7. Engineering Area Promotion Committee (representing School of Mechanical Engineering), Purdue University, 2025-present.

## APPENDIX

## STUDENT AWARDS

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1. Outstanding abstract for MRS Spring conference, 2016 (Rong Xu).
  2. Extreme Mechanics Letters Best Paper Award, 2016 (Rong Xu).
  3. Drs. Helen and Marvin Adelberg Fellowship, School of Mechanical Engineering, 2017 (Rong Xu).
  4. Ward A. Lambert Graduate Teaching Fellowship, School of Mechanical Engineering, 2017 (Rong Xu).
  5. Estus H. and Vashti L. Magoon Award for Excellence in Teaching, College of Engineering, 2018 (Luize Vasconcelos, Hong Sun).
  6. Outstanding Research Award, College of Engineering, 2018 (Rong Xu).
  7. Estus H. and Vashti L. Magoon Award for Excellence in Teaching, College of Engineering, 2019 (Nikhil Sharma).
  8. Best Paper Award, 235<sup>th</sup> Electrochemical Society Meeting, 2019 (Luize Vasconcelos).
  9. Perry Teaching Fellowship, School of Mechanical Engineering, 2019 (Luize Vasconcelos)
  10. Sigma Xi Research Award, Sigma Xi Chapter at Purdue University, 2020 (Hong Sun).
  11. Perry Teaching Fellowship, School of Mechanical Engineering, 2020 (Luize Vasconcelos)
  12. Ross Fellowship, School of Mechanical Engineering, 2020 (Jiaxiu Han).
  13. Adelberg Fellowship, School of Mechanical Engineering, 2020 (Madison Perrin).
  14. Outstanding Research Award, College of Engineering, 2022 (Xiaokang Wang).
  15. R. H. Kohr Graduate Student Fellowship, School of Mechanical Engineering, 2022 (Xiaokang Wang).
  16. Ben M. Hillberry Graduate Scholarship, School of Mechanical Engineering, 2022 (Nikhil Sharma).
  17. Fredrick Andrews Fellowship, School of Mechanical Engineering, 2023 (Yetong Jia).
  18. Presidential Doctoral Excellence Award, Purdue University, 2023 (Yetong Jia).
  19. Winkelman Fellowship, School of Mechanical Engineering, 2024 (Jeongok Choe)

**JOURNAL PUBLICATIONS** ([Google Scholar](#) Citation>10000, H-index: 61)

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*Highlights:* 1 most cited paper in *Journal of Applied Physics*; 1 most cited paper in *Journal of American Ceramics Society*; 1 Best paper in *Extreme Mechanics Letters*; 1 highly cited paper in *Experimental Mechanics*; 2 most cited papers in *Journal of the Mechanics and Physics of Solids*; 7 invited articles for thematic issues.

*The symbols/letters denote the following:*

*Mentees:* <sup>G</sup> = Graduate, <sup>UG</sup> = Undergraduate, <sup>PD</sup> = Post-Doctoral Researcher

<sup>#</sup> = Corresponding Author

<sup>†</sup> = Equal first authors

**Before joining Purdue**

1. **Kejie Zhao**, Changqing Chen<sup>#</sup>, Yapeng Shen, Tianjian Lu. Molecular dynamics study on the nano-void growth in face-centered cubic single crystal copper. *Computational Materials Science*. 46, 749-754 (2009).

2. **Kejie Zhao**, Liangliang Fan, Changqing Chen<sup>#</sup>. Multiaxial behavior of nanoporous single crystal copper: A molecular dynamics study. *Acta Mechanica Solida Sinica*. 22, 650-656 (2009).
3. **Kejie Zhao**, Matt Pharr, Joost J. Vlassak, Zhigang Suo<sup>#</sup>. Fracture of electrodes in lithium-ion batteries caused by fast charging. *Journal of Applied Physics*. 108, 073517 (2010).
4. **Kejie Zhao**, Matt Pharr, Joost J. Vlassak, Zhigang Suo<sup>#</sup>. Inelastic hosts as electrodes for high-capacity lithium-ion batteries. *Journal of Applied Physics*. 109, 016110 (2011). (3<sup>rd</sup> most cited article in 2012 in JAP).
5. **Kejie Zhao**, Matt Pharr, Joost J. Vlassak, Zhigang Suo<sup>#</sup>. Large plastic deformation in high-capacity lithium-ion batteries caused by charge and discharge. *Journal of the American Ceramic Society*. 94, S226-S235 (2011). (4<sup>th</sup> most cited article in JACers since 2011).
6. **Kejie Zhao**, Wei L. Wang, John Gregoire, Matt Pharr, Zhigang Suo, Joost J. Vlassak, Efthimios Kaxiras<sup>#</sup>. Lithium-assisted plastic deformation of silicon electrodes in lithium-ion batteries: a first-principles theoretical study. *Nano Letters*. 11, 2962-2967 (2011).
7. Matt Pharr, **Kejie Zhao**, Zhigang Suo, Fan-Yi Ouyang, Pilin Liu<sup>#</sup>. Concurrent electromigration and creep in lead-free solder. *Journal of Applied Physics*. 110, 083716 (2011).
8. **Kejie Zhao**, Matt Pharr, Qiang Wan, Efthimios Kaxiras, Joost J. Vlassak, Zhigang Suo<sup>#</sup>. Concurrent reaction and plasticity during lithiation of crystalline silicon in lithium-ion batteries. *Journal of the Electrochemical Society*. 159, A238-A243 (2012).
9. **Kejie Zhao**, Matt Pharr, Lauren Hartle, Joost J. Vlassak, Zhigang Suo<sup>#</sup>. Fracture and debonding in coated hollow nanostructured electrodes of lithium-ion batteries. *Journal of Power Sources*. 218, 6-14 (2012).
10. Jiang Wei Wang, Xiao Hua Liu, **Kejie Zhao**, Scott X. Mao, Zhigang Suo, Jian Yu Huang<sup>#</sup>. Sandwich-lithiation and longitudinal crack in amorphous silicon coated on carbon nanofibers. *ACS Nano*. 6, 9158-9167 (2012).
11. Laurence Brassart, **Kejie Zhao**, Zhigang Suo<sup>#</sup>. Cyclic plasticity and shakedown in high-capacity electrodes of lithium-ion batteries. *International Journal of Solids and Structures*. 50, 1120-1129 (2013).
12. **Kejie Zhao**, Georgios Tritsarlis, Matt Pharr, Wei L. Wang, Onyekwelu Okeke, Zhigang Suo, Joost J. Vlassak, Efthimios Kaxiras<sup>#</sup>. Reactive flow in silicon electrodes assisted by the insertion of lithium. *Nano Letters*. 12, 4397-4403 (2012).
13. Georgios Tritsarlis, **Kejie Zhao**, Onyekwelu Okeke, Efthimios Kaxiras<sup>#</sup>. Diffusion of lithium in bulk amorphous silicon: A theoretical study. *Journal of Physical Chemistry C*. 116, 22212-22216 (2012).
14. Matt Pharr, **Kejie Zhao**, Xinwei Wang, Zhigang Suo, Joost J. Vlassak<sup>#</sup>. Kinetics of initial lithiation of crystalline silicon electrodes of lithium-ion batteries. *Nano Letters*. 12, 5039-5047 (2012).
15. Ekin D. Cubuk, Wei L. Wang, **Kejie Zhao**, Joost J. Vlassak, Zhigang Suo, Efthimios Kaxiras<sup>#</sup>. Morphological evolution of Si nanowires upon lithiation: A first-principles multiscale model. *Nano Letters*. 13, 2011-2015 (2013).

16. Tongqing Lu, Chao Chen, **Kejie Zhao**, Weixu Zhang, Tiejun Wang<sup>#</sup>. Bulge test at nano-scale: The surface effects. *Applied Physics Letters*. 103, 053110 (2013).
17. **Kejie Zhao**<sup>#</sup>, Yonggang Li, Laurence Brassart. Pressure-sensitive plasticity of lithiated silicon in Li-ion batteries. *Acta Mechanica Sinica*. 29, 379-387 (2013). (Invited article for the special issue on “Recent Progress in Mechanics and Thermophysics Research in Fuel Cells and Batteries”)
18. Kai He, Huolin Xin, **Kejie Zhao**, Xiqian Yu, Dennis Nordlund, Tsu-Chien Weng, Jing Li, Yi Jiang, Christopher A. Cadigan, Ryan M. Richards, Marca M. Doeff, Xiao-Qing Yang, Eric A. Stach, Ju Li, Feng Lin, Dong Su<sup>#</sup>. Transitions from near-surface to interior redox in NiO lithium conversion electrode. *Nano Letters*. 15, 1437-1444 (2015).
19. Sangtae Kim, Soon Ju Choi, **Kejie Zhao**, Hui Yang, Giorgia Gobbi, Sulin Zhang, Ju Li<sup>#</sup>. Electrochemically driven mechanical energy harvesting. *Nature Communications*. 7, 10146 (2016).

#### **Purdue work: Teaching**

20. Hyun Jin Cho<sup>#</sup>, **Kejie Zhao**<sup>#</sup>, Cho Rong Lee, Debra Runshe, Chuck Krousgrill. Active learning through flipped classroom in mechanical engineering: Improving students’ perception of learning and performance. *International Journal of STEM Education*. 8, 46 (2021).

#### **Purdue work: Research**

21. Yuefei Zhang, Yujie Li, Zhenyu Wang, **Kejie Zhao**<sup>#</sup>. Lithiation of SiO<sub>2</sub> in Li-ion batteries: in-situ transmission electron microscopy experiments and theoretical studies. *Nano Letters*. 14, 7161-7170 (2014).
22. Yuefei Zhang<sup>#</sup>, Jin Wang, Haiquan Shan, **Kejie Zhao**<sup>#</sup>. Strengthening high-stacking-fault-energy metals via parallel and parallelogram nanotwins. *Scripta Materialia*. 108, 35-39 (2015).
23. Yuefei Zhang, Yujie Li, Zhenyu Wang, **Kejie Zhao**<sup>#</sup>. Lithiation of ZnO nanowires studied by in-situ transmission electron microscopy and theoretical analysis. *Mechanics of Materials*. 91, 313-322 (2015). (Invited article for the special issue on “Mechanics of Energy Conversion and Storage”)
24. Dongwoo Lee, Gi-dong Sim, **Kejie Zhao**, Joost J. Vlassak<sup>#</sup>. Kinetic role of carbon in solid-state synthesis of zirconium diboride using nano-laminates: Nanocalorimetry experiments and first-principles calculations. *Nano Letters*. 15, 8266-8270 (2015).
25. Dongwoo Lee, Joost J. Vlassak<sup>#</sup>, **Kejie Zhao**<sup>#</sup>. First-principles theoretical studies and nano-calorimetry experiments on solid-state alloying of Zr-B. *Nano Letters*. 15, 6553-6558 (2015).
26. Hyea Kim, Jung Tae Lee, Alexandre Magasinski, **Kejie Zhao**, Yang Liu, Gleb Yushin<sup>#</sup>. In-situ TEM observation of electrochemical lithiation of sulfur confined within inner cylindrical pores of carbon nanotubes. *Advanced Energy Materials*. 5, 1501306 (2015).
27. Yaowu Hu, Prashant Kumar, Yi Xuan, Biwei Deng, Shenyu Jin, Rong Xu<sup>G</sup>, Minghao Qi, **Kejie Zhao**, Gary J. Cheng<sup>#</sup>. Ultrafast and precise imprinting of bilayered metallic 3D plasmonic nanostructures. *Nanoscale*. 8, 172-178 (2016).

28. **Kejie Zhao**<sup>#</sup>, Yi Cui<sup>#</sup>. Understanding the role of mechanics in energy materials: A perspective. *Extreme Mechanics Letters*. 9, 347-352 (2016).
29. Rong Xu<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. Mechanical interactions regulated kinetics and morphology of composite electrodes in Li-ion batteries. *Extreme Mechanics Letters*. 8, 13-21 (2016). **(Best Paper Award in 2016)**
30. Rong Xu<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. Electro-chemo-mechanics of electrodes in Li-ion batteries: A review. *ASME Journal of Electrochemical Energy Conversion and Storage*. 13, 030803 (2016). (Invited article for the special issue on “Multiphysics Coupling in Energy Storage”)
31. Rong Xu<sup>G</sup>, Luize Scalco de Vasconcelos<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. Computational analysis of chemomechanical behaviors of composite electrodes in Li-ion batteries. *Journal of Materials Research*. 31, 2715-2727 (2016). (Invited Feature Paper, News report in MRS Bulletin.)
32. Luize Scalco de Vasconcelos<sup>G</sup>, Rong Xu<sup>G</sup>, Jianlin Li, **Kejie Zhao**<sup>#</sup>. Grid indentation analysis of mechanical properties of composite electrodes in Li-ion batteries. *Extreme Mechanics Letters*. 9, 495-502 (2016).
33. Dongwoo Lee, Joost J. Vlassak, **Kejie Zhao**<sup>#</sup>. First-principles analysis on the catalytic role of additives in low-temperature synthesis of zirconium diboride. *ACS Applied Materials & Interfaces*. 8, 10995-11000 (2016).
34. Yonghe Li, Hong Sun<sup>G</sup>, Xiaopeng Cheng, Yuefei Zhang, **Kejie Zhao**<sup>#</sup>. In-situ TEM experiments and first-principles studies on the electrochemical and mechanical behaviors of  $\alpha$ -MoO<sub>3</sub> in Li-ion batteries. *Nano Energy*. 27, 95-102 (2016).
35. Ze Liu, Benxin Wu<sup>#</sup>, Avik Samanta, Ninggang Shen, Hongtao Ding, Rong Xu<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. Ultrasound-assisted water-confined laser micromachining (UWLM) of metals: Experimental study and time-resolved observation. *Journal of Materials Processing Technology*. 245, 259-269 (2017).
36. Sulin Zhang<sup>#</sup>, **Kejie Zhao**<sup>#</sup>, Ting Zhu, Ju Li. High-capacity anode materials for lithium ion and sodium ion batteries: Chemomechanical degradation and mitigation strategies. *Progress in Materials Science*. 89, 479-521 (2017). (Invited review article)
37. Hong Sun<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. Electronic structure and comparative properties of LiNi<sub>x</sub>Mn<sub>y</sub>Co<sub>z</sub>O<sub>2</sub> cathode materials. *Journal of Physical Chemistry C*. 121, 6002-6010 (2017).
38. Qiming Chen, Rong Xu<sup>G</sup>, Zitao He, **Kejie Zhao**<sup>#</sup>, Liang Pan<sup>#</sup>. Printing 3D gel polymer electrolyte in lithium-ion microbattery using stereolithography. *Journal of the Electrochemical Society*. 164, A1852-A1857 (2017).
39. Jincheng Lei<sup>G</sup>, Yaowu Hu, Zishun Liu, Gary J. Cheng, **Kejie Zhao**<sup>#</sup>. Defects mediated corrosion in graphene coating layer. *ACS Applied Materials & Interfaces*. 9, 11902-11908 (2017).
40. Qingqing Sun, Qingyou Han<sup>#</sup>, Wilson Xu, Jie Li, Rong Xu<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. A comparison of AA2024 and AA7150 subjected to ultrasonic shot peening: Microstructure, surface segregation and corrosion. *Surface and Coatings Technology*. 337, 552-560 (2018).
41. Qingqing Sun, Qingyou Han<sup>#</sup>, Rong Xu<sup>G</sup>, **Kejie Zhao**<sup>#</sup>, Jie Li. Localized corrosion behavior of AA7150 after ultrasonic shot peening: corrosion depth vs. impact energy. *Corrosion Science*. 130, 218-230 (2017).

42. Hong Sun<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. Atomistic origins of high capacity and high structural stability of polymer derived SiOC anode materials. *ACS Applied Materials & Interfaces*. 9, 35001-35009 (2017).
43. Rong Xu<sup>G</sup>, Hong Sun<sup>G</sup>, Luize Scalco de Vasconcelos<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. Mechanical and structural degradation of LiNi<sub>x</sub>Mn<sub>y</sub>Co<sub>z</sub>O<sub>2</sub> cathode in Li-ion batteries: An experimental study. *Journal of the Electrochemical Society*. 164, A3333-A3341 (2017).
44. Biwei Deng, Rong Xu<sup>G</sup>, **Kejie Zhao**, Yongfeng Lu, Sabyasachi Ganguli, Gary J. Cheng<sup>#</sup>. Cyclable, recoverable, non-buckling metamaterial: A ceramic/c-polydopamine layered hollow nanolattice. *Materials Today*. 21, 467-474 (2018).
45. Rong Xu<sup>G</sup>, Luize Scalco de Vasconcelos<sup>G</sup>, Junzhe Shi<sup>UG</sup>, Jianlin Li, **Kejie Zhao**<sup>#</sup>. Disintegration of primary particles in LiNi<sub>x</sub>Mn<sub>y</sub>Co<sub>z</sub>O<sub>2</sub> cathode materials. *Experimental Mechanics*. 58, 549-559 (2018). (Invited article for the special issue on “Mechanics of Energy Materials”; Highly cited article on *Experimental Mechanics*)
46. Luize Scalco de Vasconcelos<sup>G</sup>, Rong Xu<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. Operando nanoindentation: A new platform to measure the mechanical properties of electrodes during electrochemical reactions. *Journal of the Electrochemical Society*. 164, A3840-A3847 (2017).
47. Fei Yin, Yanfei Liu, Rong Xu<sup>G</sup>, **Kejie Zhao**, Austin Partina, Qingyou Han<sup>#</sup>. Nanograined surface fabricated on the pure copper by ultrasonic shot peening and an energy-density based criterion for peening intensity quantification. *Journal of Manufacturing Processes*. 32, 656-663 (2018).
48. Fei Yin, Rong Xu<sup>G</sup>, Shan Hu, **Kejie Zhao**, Shiqi Yang, Shihuan Kuang, Qiang Li, Xinghang Zhange, Qingyou Han<sup>#</sup>. Enhanced mechanical and biological performances of an extremely fine nanograined cell-substrate interface fabricated by ultrasonic shot peening. *ACS Biomaterials Science & Engineering*. 4, 1609-1621 (2018).
49. Chung-Hao Cai, Rong-Zhi Chen, Ting-Shan Chan, Ying-Jui Lu, Wei-Chih Huang, Chao-Chun Yen, **Kejie Zhao**, Yu-Chieh Lo, Chih-Huang Lai<sup>#</sup>. Interplay between potassium doping and bandgap profiling in selenized Cu(In,Ga)Se<sub>2</sub> solar cells: A functional CuGa:KF surface precursor layer. *Nano Energy*. 47, 393-400 (2018).
50. Ze Liu, Benxin Wu<sup>#</sup>, Rong Xu<sup>G</sup>, **Kejie Zhao**, Yung Shin. Microhole drilling by double laser pulses with different pulse energies. *ASME Journal of Manufacturing Science and Engineering*. 140, 091015 (2018).
51. Linqin Mu, Ruoqian Lin, Rong Xu<sup>G</sup>, Lili Han, Dimosthenis Sokaras, James D. Steiner, Tsu-Chien Weng, Dennis Nordlund, Marca M. Doeff, **Kejie Zhao**, Huolin L. Xin<sup>#</sup>, Feng Lin<sup>#</sup>. Oxygen release induced chemomechanical breakdown of layered cathode materials. *Nano Letters*. 18, 3241-3249 (2018).
52. Xuyi Luo, Hong Sun<sup>G</sup>, Tianxiang Mi, Natalie M. Kadlubowski, Yan Zhao, **Kejie Zhao**, Jianguo Mei<sup>#</sup>. Bis-isoindigos: New electron-deficient building blocks for constructing conjugated polymers with extended electron delocalization. *Asian Journal of Organic Chemistry*. 7, 2248-2253 (2018).
53. Fei Yin, Gary J.Cheng, Rong Xu<sup>G</sup>, **Kejie Zhao**, Qiang Li, Jie Jian, Shan Hu, Shaoheng Sun, Licong An, Qingyou Han<sup>#</sup>. Ultrastrong nanocrystalline stainless steel and its Hall-Petch relationship in the nanoscale. *Scripta Materialia*. 155, 26-31 (2018).

54. Rong Xu<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. Corrosive fracture of electrodes in Li-ion batteries. *Journal of the Mechanics and Physics of Solids*. 121, 258-280 (2018). (Among the most cited articles of JMPS since 2018).
55. Qingqing Sun, Rong Xu<sup>G</sup>, Qingyou Han<sup>#</sup>, **Kejie Zhao**, Xingtao Liu, Ian McAdams, Ruiji Sun, Wilson Xu, Jie Li, Yin Fei, Jianyue Zhang, Licong An. Chemical gradient induced by surface nanocrystallization. *Applied Materials Today*. 14, 137-142 (2019).
56. Sihao Xia, Linqin Mu, Zhengrui Xu, Junyang Wang, Chenxi Wei, Lei Liu, Piero Pianetta, **Kejie Zhao**, Xiqian Yu<sup>#</sup>, Feng Lin<sup>#</sup>, Yijin Liu<sup>#</sup>. Chemomechanical breakdown of layered cathode materials undergoing fast charging in lithium batteries. *Nano Energy*. 53, 753-762 (2018).
57. Chenxi Wei, Yan Zhang, Sang-Jun Lee, Linqin Mu, Jin Liu, Chenxu Wang, Marca Doeff, Piero Pianetta, Dennis Nordlund, Xi-Wen Du, Yangchao Tian, **Kejie Zhao**, Jun-Sik Lee, Feng Lin<sup>#</sup>, Yijin Liu<sup>#</sup>. Thermally driven mesoscale chemomechanical interplay in  $\text{Li}_{0.5}\text{Ni}_{0.6}\text{Mn}_{0.2}\text{Co}_{0.2}\text{O}_2$  cathode materials. *Journal of Material Chemistry A*. 6, 23055-23061 (2018).
58. Luize Scalco de Vasconcelos<sup>G</sup>, Nikhil Sharma<sup>G</sup>, Rong Xu<sup>G</sup>, **Kejie Zhao**<sup>#</sup>. In-situ nanoindentation measurement of local mechanical behavior of composite electrodes in liquid electrolyte. *Experimental Mechanics*. 59, 337-347 (2019). (Invited article for the special issue on “Recent Advances in Micro/Nano-scale Experimental Mechanics”)
59. Yuwei Mao, Xuelong Wang, Sihao Xia, Kai Zhang, Chenxi Wei, Seongmin Bak, Zulipiya Shadike, Xuejun Liu, Yang Yang, Rong Xu<sup>G</sup>, Piero Pianetta, Stefano Ermon, Eli Stavitski, **Kejie Zhao**, Zhengrui Xu, Feng Lin, YoungHo Shin, Xiao-Qin Yang<sup>#</sup>, Enyuan Hu<sup>#</sup>, Yijin Liu<sup>#</sup>. High-voltage charging induced strain, heterogeneity, and micro-cracks in secondary particles of a nickel-rich layered cathode material. *Advanced Functional Materials*. 1900247 (2019).
60. Fang Hao, Xiaowei Chi, Yanliang Liang, Ye Zhang, Rong Xu<sup>G</sup>, Hua Guo, Hui Dong, **Kejie Zhao**, Jun Lou, Yan Yao<sup>#</sup>. Forming stable cathode solid electrolyte interface: Benefits of organic cathode materials in all-solid-state batteries. *Joule*. 3, 1349-1359 (2019).
61. Yang Yang<sup>†</sup>, Rong Xu<sup>G†</sup>, Kai Zhang<sup>†</sup>, Sang-Jun Lee<sup>†</sup>, Linqin Mu, Pengfei Liu<sup>G</sup>, Crystal K. Waters, Stephanie Spence, Zhengrui Xu, Chenxi Wei, David J. Kautz, Qingxi Yuan, Yuhui Dong, Young-Sang Yu, Xianghui Xiao, Piero Pianetta, Peter Cloetens, Jun-Sik Lee, **Kejie Zhao**<sup>#</sup>, Feng Lin<sup>#</sup>, Yijin Liu<sup>#</sup>. Quantification of heterogeneous degradation in Li-ion batteries. *Advanced Energy Materials*. 1900674 (2019).
62. Rong Xu<sup>G</sup>, Yang Yang, Fei Yin, Pengfei Liu<sup>G</sup>, Peter Cloetens, Yijin Liu, Feng Lin, **Kejie Zhao**<sup>#</sup>. Heterogeneous damage in Li-ion batteries: Experimental analysis and theoretical modeling. *Journal of the Mechanics and Physics of Solids*. 129, 160-183 (2019). (Among the most cited articles of JMPS since 2018).
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127. Wenlong Li<sup>†</sup>, Tianxiao Sun<sup>†</sup>, Sameep Rajubhai Shah Shrivastava<sup>G†</sup>, Zhengyu Ju, **Kejie Zhao**<sup>#</sup>, Guihua Yu<sup>#</sup>, Yijin Liu<sup>#</sup>. Direct optical observation of solid electrolyte interphase formation dynamics in lithium-ion batteries. *PNAS*. Accepted.
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#### **PATENT**

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1. **Kejie Zhao**, Luize Scalco De Vasconcelos<sup>G</sup>, Rong Xu<sup>G</sup>. Apparatus to measure mechanical properties of electrodes during electrochemical reactions and method of using the same. US Patent, 11002652, 2021.
2. Jianguo Mei, **Kejie Zhao**, Xiaokang Wang<sup>G</sup>, Ke Chen. Organic electrochromic devices with increased lifetime. US Non-Provisional Patent submitted, 17126926, December 23<sup>rd</sup>, 2020.
3. **Kejie Zhao**, Nikhil Sharma<sup>G</sup>, Luize Scalco De Vasconcelos<sup>G</sup>. A Design of Electrochemical Cell for Operando Optical Microscope. US Non-Provisional Patent submitted, 63/497328, April 20<sup>th</sup>, 2023.

#### **INVITED DEPARTMENT SEMINARS**

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1. School of Mechanical Engineering, Purdue University, 03/22/2013.
2. Department of Mechanical Engineering, National University of Singapore, 07/02/2015.
3. Department of Materials Science & Engineering, Texas A & M, 10/28/2015.
4. Department of Mechanical Engineering, University of Houston, 10/30/2015.
5. Department of Civil Engineering, University of Minnesota, 06/02/2016.

6. Mechanical and Aerospace Engineering Department, UCLA, 05/25/2018.
7. Institute of Applied Materials, Karlsruhe Institute of Technology, Germany, 07/10/2018.
8. Extreme Materials Institute, Johns Hopkins University, 09/14/2018.
9. Department of Aerospace Engineering, UIUC, 09/19/2018.
10. School of Materials Science and Engineering, Purdue University, 09/21/2018.
11. School of Mechanical Engineering, MIT, 09/25/2018.
12. Department of Aerospace Engineering and Engineering Mechanics, UT-Austin, 11/01/2018.
13. Department of Mechanical Engineering, Texas A&M University, 11/02/2018.
14. The George W. Woodruff School of Mechanical Engineering, Georgia Tech, 01/31/2019.
15. The Princeton Institute for the Science and Technology of Materials and the Princeton Center for Complex Materials, Princeton University, 02/13/2019.
16. Department of Mechanical and Aerospace Engineering, UCSD, 03/11/2019.
17. Department of Mechanical Engineering, University of Michigan, 04/02/2019.
18. Micron School of Materials Science and Engineering, Boise State University, 04/26/2019.
19. Department of Mechanical and Process Engineering, ETH Zurich, 07/11/2019.
20. Department of Mechanical Engineering, University of Washington, 02/11/2020.
21. Pacific Northwest National Laboratory, 02/12/2020.
22. School of Aerospace Engineering, Tsinghua University, 04/16/2021.
23. Institute of Physics, Chinese Academy of Science, 05/07/2021.
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26. Department of Aerospace Engineering and Engineering Mechanics, UT-Austin, 09/28/2021.
27. Department of Mechanical and Aerospace Engineering, University of California, Irvine, 4/15/2022.
28. Department of Mechanical Engineering, University of Connecticut, Connecticut, 11/4/2022.
29. Department of Nuclear Engineering, Hanyang University, 9/6/2023.
30. Department of Materials Science and Engineering, Seoul National University, 9/8/2023.
31. School of Mechanical Engineering, IUPUI, 3/21/2024.
32. Walker Department of Mechanical Engineering, UT-Austin, 9/2/2025.

#### **INVITED CONFERENCE PRESENTATIONS**

1. Fracture and debonding in lithium-ion batteries with electrodes of hollow core-shell nanostructures. 49<sup>th</sup> Annual Technical Conference of Society of Engineering Sciences, Atlanta, 10/10/2012.
2. Lithiation of SiO<sub>2</sub> in Li-ion batteries: in-situ transmission electron microscopy experiments and theoretical studies. MRS Spring Meeting & Exhibit, San Francisco, 04/06/2015.
3. SiO<sub>2</sub> in Li-ion batteries: in-situ transmission electron microscopy experiments and theoretical studies. 8th International Conference on Materials for Advanced Technologies (ICMAT2015), Singapore, 06/28/2015.
4. Lithiation of ZnO nanowires studied by in-situ transmission electron microscopy and

- theoretical analysis. ASME 2015 IMECE conference, Houston, TX, 11/06/2015.
5. Low-temperature synthesis of transition-metal diborides using reactive laminates: An analysis using first-principles modeling and nanocalorimetry experiments. Materials Science & Technology 2016, Salt Lake City, UT, 10/23/2016.
  6. Plasticity in Li-ion Batteries. International Conference on Plasticity, Damage, and Fracture, Puerto Vallarta, Mexico, 01/03/2017.
  7. Chemomechanics in Li-ion batteries. TMS 2017 Annual Meeting and Exhibition, San Diego, CA, 02/26/2017.
  8. Computational analysis of chemomechanical behaviors of composite electrodes in Li-ion batteries. 14th International Conference of Fracture (ICF14). Greece, 06/18/2017.
  9. Chemomechanical behaviors of composite electrodes in Li-ion batteries: Experiments and modeling. TMS 2018 Annual Meeting & Exhibition, Phoenix, 03/11/2018.
  10. Solid-state phase transition in organic semiconductor molecules: A first-principles study. 4th International Workshop on Soft Machines and Mechanics, Xi'an, China. 06/15/2018.
  11. Mechanical and structural degradation of  $\text{LiNi}_x\text{Mn}_y\text{Co}_z\text{O}_2$  cathode in Li-ion batteries. 10th European Solid Mechanics Conference, Bologna, Italy, 07/02/2018.
  12. First-principles theoretical study on lithiation of SiOC anode for Li-ion batteries. NSF PIER Workshop, Kansas State University, 07/16/2018.
  13. Mechanics of composite electrodes in Li-ion batteries: Experiments and modeling. 13th World Congress on Computational Mechanics, New York, 07/22/2018.
  14. Chemomechanical behavior of composite electrodes in Li-ion batteries: Experiments and modeling. 2018 SSRL/LCLS Users' Meeting, CA, 09/25/2018.
  15. Chemomechanical behavior of composite electrodes in Li-ion batteries: Experiments and modeling. ECS and SMEQ Joint International Meeting, Cancun, Mexico. 09/30/2018.
  16. Chemomechanical behavior of composite electrodes in Li-ion batteries: Experiments and modeling. 55th Society of Engineering Science Annual Meeting, Madrid, Spain, 10/12/2018.
  17. Mechanical reliability of Li-ion batteries. 17<sup>th</sup> Annual IEEE Workshop on Microelectronics and Electron Devices, Boise, Idaho, 04/26/2019
  18. Operando nanoindentation on electrodes of Li-ion batteries. 2019 Society for Experimental Mechanics (SEM) Annual Meeting, Reno, Nevada, 06/03/2019.
  19. Mechanical reliability of Li-ion batteries: Operando experiments and computational modeling. 3<sup>rd</sup> International Conference on Energy Storage Materials, Shenzhen, China, 11/28/2019.
  20. Heterogeneous damage in Li-ion batteries: Experimental analysis and theoretical modeling. International Conference on Plasticity, Damage & Fracture 2020, Rivera Maya, Mexico, 01/03/2020.
  21. Mechanical reliability of Li-ion batteries: Operando experiments and theoretical modeling. Photon Science Seminar (online), SLAC National Accelerator Laboratory, 04/29/2020.
  22. Heterogeneous damage in Li-ion batteries: Experimental analysis and theoretical modeling. MRS Spring Meeting (Virtual), 04/18/2021.
  23. Heterogeneous activities and mechanical damage in Li-ion batteries: Synchrotron analysis and theoretical modeling. International Conference on Electrochemical Energy

- System, Shaoxing, China, 05/14/2021.
24. Heterogeneous electrochemistry and damage in rechargeable batteries. Chinese Congress of Theoretical and Applied Mechanics, Chengdu, China, 08/01/2021.
  25. Machine-learning-revealed statistics of mechanical degradation in Li-ion battery cathodes. Mechanistic Machine Learning and Digital Twins Conference, San Diego, 09/26/2021.
  26. Heterogeneous mechanical damage in Li-ion batteries at fast charging. 240<sup>th</sup> ECS Annual Meeting, Orlando, Florida, 10/10/2021.
  27. Operando nanoindentation measurement of mechanical properties of battery materials. KLA battery symposium, virtual, 11/10/2021.
  28. Mechanics of Si anodes: Operando experiments and computational modeling. Sila Nanotechnologies, Inc., virtual, 04/22/2022.
  29. Mechanics of organic mixed ionic-electronic conductors for bioelectronics. Army Research Office (ARO) workshop on bioelectronics, Austin, TX, 05/24/2022.
  30. Dynamics and heterogeneity of particle network in composite electrodes. International Conference on Multiscale Materials Modeling, Baltimore, MD, 10/2/2022.
  31. Data-driven analysis of dynamics and heterogeneity in composite electrodes of batteries. Society of Engineering Science Annual Conference, Texas A&M University, TX, 10/16/2022.
  32. Heterogeneous damage and network evolution in composite electrodes of Li-ion batteries. MRS Fall Meeting, Boston, MA, 11/27/2022.
  33. Dynamics and heterogeneity of particle network in composite electrodes. ACS Spring Meeting, Indianapolis, IN, 3/26/2023.
  34. Operando experiments and modeling on the dynamics and heterogeneity of composite electrodes in batteries. MRS Spring Meeting, San Francisco, CA, 4/10/2023.
  35. Dynamics and heterogeneity of particle network in composite electrodes of Li-ion batteries. 20<sup>th</sup> International Microscopy Congress, Busan, Korea, 9/11/2023.
  36. Data-driven analysis on the dynamics and heterogeneity of particle network in composite electrodes, Society of Engineering Science Annual Conference, University of Minnesota, MN, 10/9/2023.
  37. Dynamics and heterogeneity of particle network in composite electrodes of Li-ion batteries, TMS Annual Meeting & Exhibition, Orlando, FL, 3/4/2023.
  38. Dynamics and heterogeneity of particle network in composite electrodes, ACS Spring Meeting, Indianapolis, IN, 3/26/2023.
  39. Mechanics of organic mixed ionic-electronic conductors (OMIECs), ACS Spring Meeting, Indianapolis, IN, 3/26/2023.
  40. Operando Experiments and Modeling on the Dynamics and Heterogeneity of Composite Electrodes in Batteries, MRS Spring Meeting, San Francisco, CA, 4/14/2023.
  41. Dynamics and heterogeneity of particle network in composite electrodes of Li-ion batteries, The 20<sup>th</sup> Microscopy Congress, Busan, Republic of Korea, 9/10/2023.
  42. Data-driven analysis on the dynamics and heterogeneity of particle network in composite electrodes, SES Annual Meeting, Minnesota, MN, 10/8/2023.
  43. Dynamics and heterogeneity of particle network in composite electrodes of Li-ion batteries, TMS Annual Conference, Orlando, FL, 3/3/2024.

44. Data-driven analysis on the dynamics and heterogeneity of particle network in composite electrodes of Li-ion batteries, MRS Spring Meeting, Seattle, WA, 4/22/2024.
45. Data-driven analysis on the dynamics and heterogeneity of particle network in composite electrodes of Li-ion batteries, The 5<sup>th</sup> International Symposium on Phase-Field Modelling in Materials Science, Hangzhou, China, 5/29/2024.
46. Mechanics, heterogeneity, and dynamics of particle network in battery materials, Theoretical and Applied Mechanics Letters, Online, 6/26/2024.
47. Dynamics and heterogeneity of particle network in composite electrodes of Li-ion batteries, World Congress on Computational Mechanics, Vancouver, Canada, 7/21/2024.
48. Dynamics and heterogeneity of particle network in composite electrodes, SES Annual Meeting, Hangzhou, China, 8/20/2024.
49. Celebrating EML: Reflecting a decade of influence on my journey, SES Annual Meeting, Hangzhou, China, 8/20/2024.
50. Dynamics and heterogeneity of particle network in composite electrodes, The Electrochemical Society Meeting, Honolulu, HI, 10/6/2024.
51. Dynamics and heterogeneity of particle network in composite electrodes, The Electronic Materials and Applications 2025 Meeting, Denver, CO, 2/27/2025.
52. Mechanical Breathing of organic mixed ionic-electronic conductors (OMIECs), Telluride Science Conference, Telluride, CO, 5/27/2025.
53. On the scale of heterogeneity of particle network in composite electrodes, The Electrochemical Society Meeting, Montreal, Canada, 5/18/2025.
54. Mechanics, heterogeneity, and dynamics of particle network in battery materials, Society for Experimental Mechanics Annual Meeting, Milwaukee, WI, 6/2/2025.
55. Mechanics, heterogeneity, and dynamics of particle network in battery materials, IUTAM Symposium on Chemomechanics, University of Oxford, UK, 6/25/2025.
56. Mechanics of Organic Mixed Ionic-electronic Conductors (OMIECs), Society of Engineering Science Annual Meeting, Atlanta, GA, 10/12/2025.
57. Mechanics, Heterogeneity, and Dynamics of Particle Networks, IMECE, Young Medalist Symposium, Memphis, TN, 11/17/2025.

## TEACHING

Semester	Course	Evaluation: Instructor	Evaluation: Course	Response Rate
2014 Fall	ME323*	3.8/5.0	3.7/5.0	43/47
2015 Spring	ME323	4.2/5.0	4.1/5.0	49/53
2015 Fall	ME323	4.4/5.0	4.0/5.0	60/69
2016 Spring	ME323	4.7/5.0	4.4/5.0	37/39
2016 Fall	ME323	4.1/5.0	3.9/5.0	73/81
2017 Spring	ME323	4.4/5.0	4.1/5.0	47/50
2017 Fall	ME323	4.2/5.0	4.0/5.0	65/74
2018 Spring	ME270**	4.1/5.0	4.1/5.0	47/64
2018 Fall	ME570***	4.4/5.0	4.3/5.0	19/20
2019 Spring	ME270	3.9/5.0	3.6/5.0	55/78
2019 Fall	ME323	4.2/5.0	4.0/5.0	83/84

2020 Spring	ME270	4.4/5.0	4.0/5.0	71/90
2020 Fall	ME323	4.5/5.0	4.2/5.0	56/63
2021 Fall	ME597 <sup>&amp;</sup>	4.6/5.0	NA	24/24
2022 Spring	ME270	4.6/5.0	NA	75/90
2022 Fall	ME597	4.4/5.0	NA	39/40
2023 Spring	ME270	4.5/5.0	NA	92/101
2023 Fall	ME597	4.8/5.0	NA	26/28
2024 Spring	ME323	4.6/5.0	NA	36/40
2024 Fall	ME597	4.5/5.0	NA	27/27
2025 Spring	ME323	4.5/5.0	NA	78/82
2025 Fall	ME593	4.6/5.0	NA	34/37

\*ME323: Mechanics of Materials. Junior Level.

\*\*ME270: Basic Mechanics I. Sophomore Level

\*\*\*ME570: Machine Design. Graduate Level.

<sup>&</sup>ME597/ME593: Solid Mechanics I. Graduate Level, Zhao developed.

## **SERVICE**

### **Service to Purdue**

1. Coordinator of Solid Mechanics area exam, School of Mechanical Engineering, 2015 Fall, 2016 Spring, 2019 Spring, 2020 Spring, 2020 Fall.
2. Member of Instructional Labs Committee, School of Mechanical Engineering, 01/2016 – 08/2020.
3. Member of Graduate Admissions Committee, and member of fellowship subcommittee, School of Mechanical Engineering, 08/2018 – 08/2019.
4. Member of Graduate Committee, School of Mechanical Engineering, 08/2020 – 08/2024.
5. Engineering Area Promotion Committee (representing School of Mechanical Engineering), College of Engineering, Purdue University, 2025-present.

### **Society service**

1. Board of Directors, Society of Engineering Science, 2021-2025.
2. Research Committee, Society for Experimental Mechanics, 2025-present.
3. Organizer of the Inaugural Future Faculty Symposium at the Society of Engineering Science Annual Conference, 10/10/2023, MN.
4. Organizer of the 2<sup>nd</sup> Future Faculty Symposium at the Society of Engineering Science Annual Conference, 10/12/2025, GA.

### **Editorship of journals**

1. Associate Editor, *Applied Mechanics Reviews*, 2024-present.
2. Technical Editor, *Experimental Mechanics*, 2025-present.
3. Guest editor for the special issue of *Extreme Mechanics Letters* on Mechanics of Energy Materials, 2016.
4. Guest editor for *Experimental Mechanics* on “Recent Progress in Chemomechanics”, 2025.

### **Workshop organized at Purdue**

1. 3<sup>rd</sup> Midwest Workshop on Mechanics of Materials and Structures, Purdue, 08/11/2017

(150 attendees).

2. Midwest SEM (Society for Experimental Mechanics) Student Meeting, Purdue, 03/10/2018 (60 attendees).

**Conference symposiums co-organized**

1. Session chair – “F1 - Stress-Related Phenomena in Electrochemical Systems”, The Electrochemical Society (ECS) 221st meeting, Seattle, WA, 05/06/2012.
2. Symposium co-organizer – “Multiphysics Simulations and Experiments for Solids”, International Mechanical Engineering Congress & Exposition (IMECE), Houston, Texas, 11/09/2012.
3. Symposium co-organizer – “Lithium-ion Batteries: When Chemistry Meets Mechanics”, 50th Annual Technical Conference of Society of Engineering Sciences (SES), Brown University, 07/08/2013.
4. Symposium co-organizer – “Mechanics of Integrated Structures and Materials in Advanced Technologies”, International Mechanical Engineering Congress & Exposition (IMECE), San Diego, CA, 11/15/2013.
5. Symposium co-organizer – “Mechanics and Electrochemistry of Energy Storage Materials”, 51th Annual Technical Conference of Society of Engineering Sciences (SES), Purdue University, 10/01/2014.
6. Symposium co-organizer – “Mechanics of Materials in Energy Technologies”, ASME 2015 Applied Mechanics and Materials Conference (McMAT), University of Washington, 06/29/2015.
7. Workshop co-organizer – 1st Midwest Workshop on Mechanics of Materials and Structures, UIUC, IL, 08/26/2015.
8. Symposium organizer – “Mechanics in Energy Storage & Conversion”, 52nd Annual Technical Conference of Society of Engineering Sciences (SES), Texas A&M University, TX, 10/25/2015.
9. Symposium co-organizer – “Mechanics of Integrated Structures and Materials in Advanced Technologies”, International Mechanical Engineering Congress & Exposition (IMECE), Houston, TX, 11/06/2015.
10. Symposium co-organizer – “Computational Methods for Model Reduction and its Engineering Applications”, 7th International Conference on Computational Methods, UC Berkeley, CA, 08/01/2016.
11. Symposium co-organizer – “Mechanics and Electrochemistry of Energy Materials”, 53rd Annual Technical Conference of Society of Engineering Sciences (SES), University of Maryland, VA, 10/02/2016.
12. Symposium co-organizer – “Mechanics of Energy Storage and Conversion – Batteries Thermoelectrics and Fuel Cells”, 2017 MRS Spring Meeting, Phoenix, AZ, 04/17/2017.
13. Symposium co-organizer – “Mechanics of Energy materials”, 54th Annual Technical Conference of Society of Engineering Sciences (SES), Northeastern University, MA, 07/25/2017.
14. Symposium co-organizer – “Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials”, MS&T 2017 conference, Pittsburg, PA, 10/08/2017.
15. Symposium co-organizer – “Mechano-Electro-Chemical Coupling in Energy Related

- Materials and Devices”, 233rd ECS meeting, Seattle, WA, 05/03/2018.
16. Symposium co-organizer – “Electro-chemo-mechanics of energy materials”, 18th U.S. National Congress on Theoretical and Applied Mechanics, Northwestern University, IL, 06/04/2018.
  17. Symposium co-organizer – “Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials”, MS&T 2018 conference, Columbus, OH, 10/14/2018.
  18. Symposium co-organizer – “Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials”, MS&T 2019 conference, Portland, OR, 09/29/2019.
  19. Symposium co-organizer – “Mechanics of Electrochemically Active Materials”, 56th Annual Technical Conference of Society of Engineering Sciences (SES), Washington University, MO, 10/13/2019.
  20. Symposium co-organizer – “Mechanics of Materials for Energy Storage and Conversion”, International Mechanical Engineering Congress & Exposition (IMECE), Salt Lake City, UT, 11/08/2019.
  21. Symposium co-organizer – “Chemomechanical and Interfacial Challenges in Energy Storage and Conversion—Batteries, and Fuel Cells”, 2019 MRS Fall Meeting, Boston, MA, 12/01/2019.
  22. Conference co-chair – Society of Engineering (SES) Annual Meeting (Virtual), 10/2021 (SES virtual month).
  23. Symposium co-organizer – “Mechanics of Electrochemical Systems”, 2022 Society of Engineering Science (SES) Annual Technical Meeting, Texas A&M University, TX, 10/16/2022.
  24. Symposium co-organizer – “Mechanics of Electrochemical Systems”, 2023 Society of Engineering Science (SES) Annual Technical Meeting, University of Minnesota, MN, 10/9/2023.
  25. Symposium co-organizer – “Characterization of Dynamics and Heterogeneity in Energy Materials”, MRS Spring Meeting, Seattle, WA, 4/7/2025.

#### **Proposal/journal reviewer**

1. NSF panel reviewer 04/2015, 02/2017, 04/2017, 04/2020, 11/2021, 04/2023, 07/2024, 02/2025, 09/2025, 10/2025 (CAREER panel).
2. ACS PRF proposal reviewer 2016, 2018, 2020.
3. DOE SCGSR proposal reviewer 2020, 2021.
4. 10+ journal paper reviews per year.

#### **International activities**

1. Co-organizer – 2017 International Workshop on Mechanics of Energy Materials, Suzhou, China, 11/08/2017.
2. Co-organizer – 2018 International Workshop on Mechanics of Energy Materials, Indian Institute of Technology Madras, Chennai, India, 11/19/2018.
3. Visitation to Institute of Applied Materials, Karlsruhe Institute of Technology, Germany. 07/09/2018 – 07/13/2018.
4. Purdue Faculty Fellowship in Europe. Visitation to Karlsruhe Institute of Technology, TU Darmstadt, ETH. 07/02/2019 – 07/25/2019.