

Aashutosh N. Mistry

Doctoral Candidate
School of Mechanical Engineering
Purdue University
West Lafayette, IN 47907, USA

Phone: +1 (832) 730 – 9071
Email: mistrya@purdue.edu
mistryaashutosh91@gmail.com
<https://www.linkedin.com/in/aashutosh-mistry-960278b3>

Research Interests

Electrochemical Physics, Kinetic and Transport Interactions, Interfacial Science, Stochastic Complexations in Porous Reactors, Surface tension driven Flow, Computation Analysis, Inverse Problems, Instrumentation, Statistical Learning

Education

Ph.D., Mechanical Engineering (expected May 2019)

2017 – present Purdue University* GPA: 4.00/4.00

2015 – 2017 Texas A&M University* GPA: 4.00/4.00

Advisor: Prof. Partha Mukherjee

Dissertation: *Mesoscale Interactions in Porous Electrodes*

* Moved from Texas A&M to Purdue in Fall 2017 with Prof. Mukherjee

M.Tech, Mechanical Engineering (Gold Medalist)

2012 – 2014 Indian Institute of Technology, Kanpur GPA: 10.00/10.00

Advisor: Prof. Krishnamurthy Muralidhar

Dissertation: *Generalized Lagrangian Model for Drop Spreading on Textured Surfaces*

B.Tech, Mechanical Engineering (Gold Medalist)

2008 – 2012 National Institute of Technology, Surat GPA: 9.95/10.00

Advisor: Prof. Jyotirmay Banerjee

Dissertation: *Numerical and Experimental Investigation on Heat Transfer in Nanofluids*

Awards and Honors

2018 Purdue College of Engineering Outstanding Research Award

2018 Edward G. Weston Summer Fellowship, the Electrochemical Society

2018 Lambert Graduate Teaching Fellowship, School of Mechanical Engineering, Purdue University

2018 Invited speaker at Gordon Research Seminar for Batteries (24 – 25th Feb)

2018 Travel Grant, the Electrochemical Society's Spring Meeting

2018 Journal cover art for Secondary-phase Stochasticity research in ACS Applied Materials & Interfaces (<https://pubs.acs.org/toc/aamick/10/7>)

2018 Editor's choice article on Interfacial modeling of carbon-binder domains

2018 Features news reports on Secondary (inactive) phase stochasticity research – Materials Research Society (MRS) Bulletin, Battery Power: Cambridge EnerTech and Purdue News

- 2018 Inaugural speaker at [Graduate Sandbox Seminar](#) (24th Jan)
- 2017 Featured news report on Thermal Cross-talk research – Materials Research Society's [Fall Meeting](#)
- 2016 Invited graduate student participant and tutorial lecturer at the [College of Multiscale Computational Modeling of Materials for Energy Applications](#), International Center for Theoretical Physics, Trieste, Italy (4 – 15th Jul)
- 2016 Invited graduate student participant at Indo-US Workshop on [Recent Advances in Multiscale Multiphysics Analysis of Energy Conversion in Li-ion Batteries](#), IIT-Bombay, India (17 – 19th Jun)
- 2015 The First prize in a poster presentation at Texas A&M Non-fossil based Technologies for Energy Workshop (24th Jun): “*Investigating Chemical and Electrochemical Interactions during Discharge of a Lithium Sulfur Cell*”
- 2014 Sashi Pundir Memorial Gold Medal for the best Master's thesis in Fluid Mechanics and Transport Phenomena, IIT-Kanpur
- 2014 Academic Excellence Award, IIT-Kanpur
- 2012 Smt. Laxmi Bala Majumdar Gold Medal for securing the 1st merit rank across all disciplines of Bachelor of Technology, NIT-Surat
- 2012 Siddhartha Gupta Gold Medal for securing the 1st merit rank across all disciplines of Bachelor of Technology, NIT-Surat
- 2012 Gold Medal for securing the 1st merit rank in Bachelor of Technology, Mechanical Engineering, NIT-Surat
- 2012 Siddhartha Gupta Gold Medal for securing the 1st merit rank in Bachelor of Technology, Mechanical Engineering, NIT-Surat

Journal Publications ([Google Scholar Page](#))

1. **A. Mistry** et al. (2018) *Electrolyte Confinement alters Lithium Electrodeposition*, ACS Energy Letters, *in press*
2. **A. Mistry** and P. P. Mukherjee (2018) *Probing Spatial Coupling of Resistive Modes in Porous Intercalation Electrodes through Impedance Spectroscopy* Physical Chemistry Chemical Physics, *in press*
3. **A. Mistry** and P. P. Mukherjee (2018) ‘*Shuttle*’ in Polysulfide Shuttle: Friend or Foe? The Journal of Physical Chemistry C 122 (42) 23845
4. **A. Mistry**, K. Smith and P. P. Mukherjee (2018) *Electrochemistry-coupled Mesoscale Complexations in Electrodes Lead to Thermo-electrochemical Extremes* ACS Applied Materials and Interfaces 10 (34) 28644
5. **A. Mistry**, K. Smith, and P. P. Mukherjee (2018) *Secondary Phase Stochastics in Li-ion Battery Cathodes* ACS Applied Materials and Interfaces 10 (7) 6317
6. **A. Mistry** and P. P. Mukherjee (2018) *Electrolyte Transport Evolution Dynamics in Li-sulfur Batteries* The Journal of Physical Chemistry C 122 (32) 18329
7. **A. Mistry** and K. Muralidhar (2018) *Spreading of a Pendant Liquid Drop underneath a Textured Substrate* Physics of Fluids 30, 042104

8. **A. Mistry** and P. P. Mukherjee (2017) *Precipitation – Microstructure Interaction in Li-S Battery Cathode* The Journal of Physical Chemistry C 121 (47) 26256
9. (joint first author) C.-F. Chen, **A. Mistry** and P. P. Mukherjee (2017) *Probing Impedance and Microstructure Evolution in Lithium-sulfur Battery Electrodes* The Journal of Physical Chemistry C 121 (39) 21206
10. **A. Mistry**, D. Juarez-Robles, M. Stein and K. Smith, P. P. Mukherjee (2016) *Analysis of Long-range Interaction in Lithium-ion Battery Electrodes* Journal of Electrochemical Energy Conversion and Storage 13 (3) 031006
11. **A. Mistry** and K. Muralidhar (2015) *Axisymmetric Model of Drop Spreading on a Horizontal Surface* Physics of Fluids 27(9) 092103
12. B. Trembacki, **A. Mistry**, et al. (2018) *Mesoscale Analysis of Conductive Binder Domain Morphology in Lithium-Ion Battery Electrodes* Journal of the Electrochemical Society, 165 (13), E725
13. M. Vasilyeva, **A. Mistry** and P. P. Mukherjee (2018) *Multiscale Model Reduction for Pore-scale Simulation of Li-ion Batteries using GMsFEM* Journal of Computational and Applied Mathematics 344, 73-88
14. N. Kotak, P. Barai, A. Verma, **A. Mistry** and P. P. Mukherjee (2018) *Electrochemistry-mechanics Coupling in Intercalation Electrodes* Journal of the Electrochemical Society, 165 (5), A1064
15. F. Usseglio-Viretta, A. Colclasure, **A. Mistry** et al., (2018) *Resolving the Discrepancy in Tortuosity Factor Estimation for Li-ion Battery Electrodes through Micro-Macro Modeling and Experiment* Journal of the Electrochemical Society 166 (14) A3403
16. Z. Liu, **A. Mistry** and P. P. Mukherjee (2017) *Mesoscale Physicochemical Interactions in Lithium-sulfur Batteries: Progress and Perspective* Journal of Electrochemical Energy Conversion and Storage 15 (1), 010802
17. M. Stein IV, **A. Mistry** and P. P. Mukherjee (2017) *Mechanistic Understanding of the Role of Evaporation in Electrode Processing* Journal of the Electrochemical Society 164 (7), A1616
18. K. Shah, N. Balsara, S. Banerjee, M. Chintapalli, A. P. Cocco, W. K. S. Chiu, I. Lahari, S. Martha, **A. Mistry** et al. (2017) *State-of-the-art and Future Research Needs for Multiscale Analysis of Li-ion Cells* Journal of Electrochemical Energy Conversion and Storage 14 (2), 020801
19. G. J. Nelson, L. J. Ausderau, J. R. Buckley, S. Shin, **A. Mistry**, P. P. Mukherjee and V. De Andrade (2017) *Transport-geometry Interactions in Li-ion Cathode Materials Imaged using X-ray Nanotomography* Journal of the Electrochemical Society 164 (7), A1412
20. P. Barai, **A. Mistry** and P. P. Mukherjee (2016) *Poromechanical Effect in the Lithium-sulfur Battery Cathode* Extreme Mechanics Letters 9 (3), 359-370
21. A. D. Dysart, J. C. Burgos, **A. Mistry** et al. (2015) *Towards Next Generation Lithium-sulfur Batteries: Non-conventional Carbon Compartments/ Sulfur Electrodes and Multi-scale Analysis* Journal of the Electrochemical Society 163 (5), A730-A741

Manuscripts under review

22. **A. Mistry** and P. P. Mukherjee, *Microstructural Stochasticity fuels Preferential Intercalation in Li-ion Battery Electrodes*
23. **A. Mistry**, H. Reddy Palle and P. P. Mukherjee, *In Operando Thermal Signature Probe for Lithium Ion Cells*
24. **A. Mistry** and P. P. Mukherjee, *A Statistical Learning based Approach to Tortuosity Estimation in Battery Electrodes*
25. **A. Mistry**, V. Srinivasan and P. P. Mukherjee, *Interfacial Dynamics in a Concentration-driven Phase Change*
26. **A. Mistry et al.**, *Mechanistic Elucidation of Physicochemical Complexations during Lithiation in a Li-air Porous Electrode*
27. **A. Mistry** and P. P. Mukherjee, *Thermal Impedance Probe to Detect Lithiation States in Lithium Ion Cells*
28. (joint first author) R. Adams, **A. Mistry et al.**, *Materials by Design: Tailored Morphology and Structures of Carbon Anodes for Enhanced Battery Safety*
29. T. Rajendra, **A. Mistry et al.**, *Quantifying Transport, Geometrical and Morphological Parameters in Li-ion Cathode Phases using X-ray Microtomography*

Book Chapters

1. (under review) P. P. Mukherjee and **A. Mistry**, *Basics of Electrochemical Energy Storage*
2. (under review) P. P. Mukherjee, **A. Mistry** and A. Verma, *Lithium-ion Batteries*
3. P. P. Mukherjee, **A. Mistry** and A. Verma (2017) *Porous Media Applications: Electrochemical Systems, in Modeling Transport Phenomena in Porous Media with Applications* eds. M. K. Das, P. P. Mukherjee, K. Muralidhar, Springer
4. P. P. Mukherjee, A. Verma, and **A. Mistry** (2017) *Mesoscale Interactions of Transport Phenomena in Polymer Electrolyte Fuel Cells, in Modeling Transport Phenomena in Porous Media with Applications* eds. M. K. Das, P. P. Mukherjee, K. Muralidhar, Springer

Conference Proceedings

1. **A. Mistry** and K. Muralidhar, *Non-isothermal Spreading of Liquid Drops: Effect of Fluid Convection*, Asian Symposium on Computational Heat Transfer and Fluid Flow, November 2015
2. **A. Mistry** and K. Muralidhar, *Study of Front Tracking Methodology for Simulation of Multiphase Flow*, Proceedings of Fortieth National Conference on Fluid Mechanics and Fluid Power, December 2013
3. **A. Mistry**, A. Verma and M. K. Das, *Modeling of Polymer Electrolyte Membrane (PEM) Fuel Cell Cathode with Agglomerate Catalyst Layer*, Proceedings of Fortieth National Conference on Fluid Mechanics and Fluid Power, December 2013

4. **A. Mistry** and J. Banerjee, *A Comparative Analysis of Single-phase and Two-fluid Model for Nanofluid Heat Transfer in Forced Convection Regime*, Proceedings of Thirty Ninth National Conference on Fluid Mechanics and Fluid Power, December 2012

Oral Presentations and Posters at Conferences

1. **A. Mistry** and P. P. Mukherjee, *Mesoscale Insights into Li-sulfur Battery Charge Transport*, 256th American Chemical Society National Meeting, Boston, MA (19 – 23rd Aug 2018)
2. **A. Mistry** and P. P. Mukherjee, *A Statistical Learning based Characterization of Lithium-ion Battery Electrodes*, 13th World Congress on Computational Mechanics, New York, NY (22 – 27th Jul 2018)
3. **A. Mistry** and P. P. Mukherjee, *Transport and Electrochemical Dynamics in the Li-S Battery Electrolyte*, 233rd Meeting of the Electrochemical Society, Seattle, WA (13 – 17th May 2018)
4. **A. Mistry** and P. P. Mukherjee, *Analyzing the Importance of Particle Morphology and Heterogeneity in Li-ion Battery Electrodes*, 233rd Meeting of the Electrochemical Society, Seattle, WA (13 – 17th May 2018)
5. **A. Mistry** and P. P. Mukherjee, *Analyzing Microstructural and Electrolyte Phase Limitations in Li-air Battery Performance*, 233rd Meeting of the Electrochemical Society, Seattle, WA (13 – 17th May 2018)
6. **A. Mistry** and P. P. Mukherjee, *Mechanistic Understanding of Transport-mechanics Interactions in Li-S Cathodes*, TMS 2018, 147th Annual Meeting and Exhibition, Phoenix, AZ (11 – 15th Mar 2018)
7. **A. Mistry**, *Inverse Formulations for Consistent Thermo-Electro-Chemical Characterization of Li-ion Batteries*, Gordon Research Seminar for Batteries, Ventura, CA (24 – 25th Feb 2018)
8. **A. Mistry**, A. Verma and P. P. Mukherjee, *Electrode Stochastics in Energy Storage*, Gordon Research Conference for Batteries, Ventura, CA (25th Feb – 1st Mar 2018)
9. **A. Mistry** and P. P. Mukherjee, *Mesoscale Physics and Stochastics in Energy Storage and Conversion*, Poster at the Prospective Graduate Student Reception, School of Mechanical Engineering, Purdue University (15th Feb 2018)
10. **A. Mistry**, *Microstructure Mediated Thermo-Electrochemical Interactions in Energy Storage*, Graduate Sandbox Seminar, School of Mechanical Engineering, Purdue University (24th Jan 2018)
11. **A. Mistry** and P. P. Mukherjee, *Thermal Cross-talk in Lithium-ion Battery Safety*, Materials Research Society Fall Meeting, Boston, MA (26th Nov – 1st Dec 2017)
12. **A. Mistry** and P. P. Mukherjee, *Simulated Calorimetry based Thermal Characterization of Lithium-ion Cells*, International Mechanical Engineering Congress & Exposition – IMECE 2017, Tampa, FL (3 – 9th Nov 2017)

13. **A. Mistry** and P. P. Mukherjee, *Hysteresis in Li-S Battery Performance*, Advanced lithium Batteries for Automotive Applications – ABAA 2017, Oakbrook, IL (23 – 25th Oct 2017)
14. **A. Mistry** and P. P. Mukherjee, *Microstructural Limitations in Lithium-sulfur Battery Performance*, 232nd Meeting of Electrochemical Society, National Harbor, MD (1 – 5th Oct 2017)
15. **A. Mistry** and P. P. Mukherjee, *Non-intercalating Phases and Electrochemical Behavior of Lithium-ion Battery Cathode*, 232nd Meeting of the Electrochemical Society, National Harbor, MD (1 – 5th Oct 2017)
16. **A. Mistry**, A. Verma, and P. P. Mukherjee, *Mesoscale Physics and Stochastics in Energy Storage*, Hawkins Lecture Poster Presentation, Purdue Mechanical Engineering, West Lafayette, IN (21st Sep 2017)
17. **A. Mistry** and P. P. Mukherjee, *Virtual Electrode Engineering: From Mesoscale Underpinnings to System Characteristics*, Advanced Automotive Battery Conference – AABC 2017, San Francisco, CA (19 – 22th Jun 2017)
18. **A. Mistry** and P. P. Mukherjee, *Demystifying Microstructure Limitations in Li/S Cells: Surface Passivation vs. Pore Blockage*, Materials Research Society Spring Meeting, Phoenix, AZ (17 – 21th Apr 2017)
19. **A. Mistry** and P. P. Mukherjee, *Mesoscale Probing of Transport-Interface Interaction in Lithium-ion Battery Electrodes*, TMS 2017 146th Annual Meeting and Exhibition, San Diego, CA (26th Feb – 2st Mar 2017)
20. **A. Mistry**, D. Juarez-Robles, and P. P. Mukherjee, *Thermo-electrochemical Analytics in Li-ion Battery Safety*, ESS Safety Forum 2017, Santa Fe, NM (22 – 24th Feb 2017)
21. **A. Mistry**, Z. Liu and P. P. Mukherjee, *Mesoscale Modeling of Transport Limitations during Discharge of a Li-S cell*, 12th Annual Lithium Battery Power Conference, Bethesda, MD (1 – 2nd Nov 2016)
22. **A. Mistry**, *Modeling and Analysis of Electrochemical Performance of Lithium-Sulfur Batteries*, College of Multiscale Computational Modeling of Materials for Energy Applications, International Center for Theoretical Physics, Trieste, Italy (4 – 15th Jul 2016)
23. **A. Mistry** and P. P. Mukherjee, *Improving Discharge Performance of Li-air Batteries with Electrode Microstructural Modifications*, College of Multiscale Computational Modeling of Materials for Energy Applications, International Center for Theoretical Physics, Trieste, Italy (4 – 15th Jul 2016)
24. **A. Mistry**, C.-F. Chen, Z. Liu and P. P. Mukherjee, *Mesoscale Modeling of Transport Limitations during Discharge of a Li-S Cell*, Indo-US Workshop on Recent Advances in Multiscale Multiphysics Analysis of Energy Conversion in Li-ion Batteries, IIT-Bombay, India (17 – 19th Jun 2016)
25. **A. Mistry**, C.-F. Chen, A. Verma and P. P. Mukherjee, *Long Range Interaction in Lithium-Ion Battery Electrodes*, Indo-US Workshop on Recent Advances in Multiscale Multiphysics Analysis of Energy Conversion in Li-ion Batteries, IIT-Bombay, India (17 – 19th Jun 2016)

26. **A. Mistry**, P. Barai, and P. P. Mukherjee, *Precipitation Induced Stress and Degradation in the Lithium-sulfur Battery Cathode*, 229th Meeting of Electrochemical Society, San Diego, CA (29th May – 2nd Jun 2016)
27. **A. Mistry**, A. Verma, R. Mukherjee and P. P. Mukherjee, *Image-based Reconstruction and Statistical Characterization of the Li-ion Battery Electrode Microstructure*, 229th Meeting of Electrochemical Society, San Diego, CA (29th May – 2nd Jun 2016)
28. **A. Mistry**, C.-F. Chen, Z. Liu and P. P. Mukherjee, *Mesoscale Modeling of the Physicochemical Interplay in the Li-sulfur Battery Porous Cathode*, Interpore 2016, Cincinnati, OH (8th May – 12th May 2016)
29. **A. Mistry**, A. Verma, D. Juarez-Robles and P. P. Mukherjee, *How Electrode Processing Affects Li-ion Battery Performance?*, Material Challenges in Alternative and Renewable Energy – MCARE 2016, Clearwater, FL (17 – 21st Apr 2016)
30. **A. Mistry**, A. Verma, D. Juarez-Robles and P. P. Mukherjee, *Physicochemical Evolution Behavior in the Li-air Battery Electrode*, Material Challenges in Alternative and Renewable Energy – MCARE 2016, Clearwater, FL (17 – 21st Apr 2016)
31. **A. Mistry**, P. Barai and P. P. Mukherjee, *A Two-way Coupled Mechano-Electrochemical Model for Estimating Active Material Degradation in Lithium-ion Battery Electrodes*, International Mechanical Engineering Congress & Exposition – IMECE 2015, Houston, TX (13 – 19th Nov 2015)
32. **A. Mistry**, D. Juarez-Robles, F. Cano-Banda, A. Hernandez-Guerrero and P. P. Mukherjee, *Correlating Precipitation Morphology in the Air Electrode to the Lithium-air Battery Discharge Performance*, 52nd Annual Technical Meeting of Society of Engineering Sciences – SES 2015, Texas A&M (26 – 28th Oct 2015)
33. P. P. Mukherjee, Z. Liu, C.-F. Chen and **A. Mistry**, *Investigating Chemical and Electrochemical Interactions during Discharge of a Lithium Sulfur Cell*, Texas A&M Non-fossil based Technologies for Energy – Research Workshop, Texas A&M (20th Oct 2015)
34. P. P. Mukherjee, A Hernandez-Guerrero, Z. Liu, C.-F. Chen, **A. Mistry**, D. Juarez-Robles and F. Cano-Banda, *High-performance Electrode Architecture for Lithium-Air Batteries*, Texas A&M – CONACyT Symposium 2015, Texas A&M (24th Jun 2015)
35. **A. Mistry** and K. Muralidhar, *Prediction of Drop Spreading in a Lagrangian Framework*, Departmental Poster Presentation, IIT Kanpur (21st Mar 2014)

Undergraduate Research Mentoring

- 2018 Aug – Monica Caito (B. S., Purdue University, IN)
Microstructural Implications of the Separator Microstructure
- 2018 Aug – Prathamesh Sankhe (B. S., Purdue University, IN)
Microstructural Analysis of Graphite Electrodes
- 2017 Jan – May Serdar Ozguc (B. S., Texas A&M University, TX)

- Identifying Microstructural Signature in Internal Resistance for Porous Intercalation Electrodes*
2016 May – Jul Akash Verma (B. Tech, IIT-Kanpur, India)
A Reduced-order Model to Quantify Thermal Behavior of Li-ion Cells during Electrochemical Testing
- 2015 Sep – Dec A team of undergrads (Texas A&M University, TX)
AggieChallenge 2015
- 2015 May – Jul Leigha Lewis (B. S., Sam Houston State University, TX)
Data-driven Characterization of Transport Properties for Electrode Microstructure of Lithium Sulfur Batteries
- 2015 May – Jul Mohit Singhal (B. Tech, IIT-Kanpur, India)
Oven Test to Measure Thermal Abuse Tolerance of Li-ion Batteries: A Lumped Model
- 2015 May – Jul Aditya Tiwari (B. Tech., NIT-Surat, India)
Drying of Particulate Slurry: A Model for Preparation of Electrodes

Other Research Experience

Summer Fellowship

Jun 2018 – Aug 2018 Edward G. Weston Summer Fellowship, the Electrochemical Society

Fellowship Mentor: Dr. Venkat Srinivasan, Argonne National Laboratory
Interfacial Effects in Concentration-driven Phase Change

Project Associate

Jun 2014 – Dec 2014 AnuPravaha I

Principal Investigator: Prof. Malay Das, Indian Institute of Technology, Kanpur
Code Parallelization of AnuPravaha I, a general purpose CFD solver

Teaching Activities

Lambert Teaching Fellowship

Fall 2018 Thermodynamics II (ME 30000; 36 students)

Spring 2018 Thermodynamics II (ME 30000; 40 students)

Exergy Analysis, Ideal Gas Mixtures, Psychrometry

Teaching Assistantships

Spring 2014 Experimental Methods in Thermal Sciences (ME 649; 18 students)

Fall 2013 Programming and Numerical Analysis (ME 685; 22 students)

Spring 2013 Fluid Mechanics (ME 231; 105 students)

Lectures and Workshops

2014, Jul 24-25th How to generate Technical Diagrams/Figures using Asymptote (IIT-Kanpur)

2014, Jun 30th – Jul 4th How to become Friends with MATLAB? (IIT-Kanpur)

2013, Aug 27 – 31st Basics of MATLAB programming (IIT-Kanpur)

- 2012, Mar 28th Application of Mathematics in “Real-life Problems” (NIT-Surat)
2010, Sep 15th Steering and Differential (NIT-Surat)

Peer Reviewer

Physics of Fluids, Journal of the Electrochemical Society, RSC Advances (the Royal Society of Chemistry), Journal of the Electrochemical Energy Storage and Conversion

Conferences: ASME Power & Energy Conference 2018, IEEE ITherm 2018, IEEE ITherm 2017

Professional Affiliations

1. American Society of Mechanical Engineering (ASME) since Nov 2015
2. The Electrochemical Society (ECS) since Nov 2015
3. Materials Research Society (MRS) since Mar 2017
4. The Minerals, Metals and Materials Society (TMS) since Mar 2017
5. American Chemical Society (ACS) since Jul 2018
6. American Physical Society (APS) since Oct 2018

Scientific Journalism

News reports of invited talks during MRS meetings. Involved attending the talks, understanding the related concepts and reporting them for a broader scientific audience in the written format.

- 2018 Dislocation Dynamics explain Voltage Fade in Layered-oxide Battery Materials
2017 Asphalt Porous Structure Enables Fast-charging High-capacity Li Metal Anode
2017 Bio-inspired Bistable Shape-changing Displacement Sensors
2017 Data Mining in Small-scale Plasticity
2017 Bio-inspired Anti-fogging Materials: from the Mosquito Effect to the Cicada Effect
2017 Analyzing the Stability and Kinetics of the Li metal – solid electrolyte Interface
2017 Safe, High-energy-density Solid-state Li Batteries
2017 Enhancing Superhydrophobicity and Icephobicity through Surface Flexibility Inspired by Butterfly Wings
2017 Phase Field Models and Interfacial Evolution: a Critical Test of Simulation
2017 Benchmarking Problems for Phase Field Codes
2017 Controlling the Electrical Properties of Organic Electronics: a Path Towards Low-power Printed Electronics
2017 Design of Lubricant Infused Surfaces
2017 Enhancing Understanding of the Solid-electrolyte Interface: Multi-modal Characterization of Battery Systems
2017 Graphene Quantum Dots from Coal

- 2017 The DAGS chemistry: Droplet Assisted Growth and Shaping for Synthesis of Polymeric Nano- and Microstructures
- 2017 Special Workshop on Nanomaterials and Their Applications
- 2017 3D Printing of Transparent and Conductive Heterogeneous Hydrogel-elastomer Systems
- 2017 Towards Photo-rechargeable Lithium-ion Battery
- 2017 Garnet-based Li-metal Batteries
- 2017 X-ray Nanotomography reveals 3D Internal Magnetization Structure
- 2017 Electrolyte Gating induced Insulator-to-metal Transition in WO_3 Mechanism Identified
- 2017 Intermolecular Forces for Self-assembly Identified through Simulations
- 2017 Solar CO_2 Reduction Coupled with Water Oxidation—Semiconductor/Metal-Complex Hybrid System
- 2017 Photoelectrochemical Solar Energy Storage—Hydrogen Production vs Direct CO_2 Reduction and Photoredox Flow Batteries
- 2017 Nanogenerators for Self-powered Systems and Large-scale Blue Energy
- 2017 Surface-bound Enzymatic Reactions Organize Microcapsules and Protocells in Solution
- 2017 Data Analytics for Mining Process-Structure-Property Linkages for Hierarchical Materials
- 2017 A Multiscale Approach to Cathode Design Based on Mapping Intercalation Gradients within Individual Particles and across Particle Aggregates
- 2017 Needs and Challenges Associated with High Energy Batteries with an Emphasis on Thermodynamic Underpinnings
- 2017 Understanding the Nature of Chemical and Electrochemical Stability of Electrolytes at Mg Anode Surfaces

Miscellaneous

- 2016 Sep Organizer and judge at Inaugural Texas A&M Energy Conference
- 2016 Aug Invited judge at Summer Undergraduate Research Poster Competition, Texas A&M University
- 2016 May Volunteer at the 229th meeting of the Electrochemical Society
- 2015 Aug Invited judge at Summer Undergraduate Research Poster Competition, Texas A&M University
- 2014 Aug Organizer at IITK Student Research Convention
Conceptualized, planned and organized a two-day conference at IIT-Kanpur for undergraduate and graduate students. The conference had 4 invited lectures by IIT-Kanpur professors, 32 oral presentations (8 sessions), 68 posters, and a small expo by start-ups being supported by IIT-Kanpur.