Dr. Yan Yao

Hugh Roy and Lillie Cranz Cullen Distinguished Professor
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Professional Experience

2022–Present	**Hugh Roy and Lillie Cranz Cullen Distinguished Professor** Department of Electrical and Computer Engineering, Chemical and Biomolecular Engineering (Affiliated) & Materials Science and Engineering Program (Affiliated) University of Houston, Houston, TX
2020–2022	**Professor** Department of Electrical and Computer Engineering, Chemical and Biomolecular Engineering (Affiliated) & Materials Science and Engineering Program (Affiliated) University of Houston, Houston, TX
2017–2020	**Associate Professor** (with Tenure) Department of Electrical and Computer Engineering, Chemical and Biomolecular Engineering (Affiliated) & Materials Science and Engineering Program (Affiliated) University of Houston, Houston, TX
2012–2017	**Assistant Professor** Department of Electrical and Computer Engineering, Materials Science and Engineering Program (Affiliated) University of Houston, Houston, TX
2010–2012	**Postdoctoral Scholar**, Department of Materials Science and Engineering Stanford University, Stanford, CA
2008–2010	**Senior Scientist**, Polyera Corporation, Skokie, IL
2003–2008	**Research Assistant**, Department of Materials Science and Engineering University of California, Los Angeles, CA

Education

University of California Los Angeles, Los Angeles, CA
Ph.D. in Materials Science and Engineering, 2003–2008

Fudan University, Shanghai, China
M.S. in Materials Science, 2000–2003
B.S. in Materials Science, 1996–2000

Research Summary

Dr. Yan Yao is an internationally recognized leader in the field of electrochemical energy storage, particularly known for his pioneering work on battery chemistries beyond lithium-ion. His research focuses on the intersection of electrochemistry and materials science. He specialize in multivalent, solid-state and aqueous batteries designed to improve safety and reduce environmental impact. Dr. Yao serves as the Deputy Thrust Lead in DOE's Energy Storage Research Alliance (ESRA) as well as Principal Investigator for several flagship battery programs, including the Battery500 Consortium, the Low-cost Earth-abundant Na-ion Storage (LENS)

Consortium, Vehicle Technology Office's Battery Materials Research program, and three ARPA-E projects. Dr. Yao authored over 150 research papers and has received numerous awards, including the 2025 Edith and Peter O'Donnell Award in Engineering from TAMEST, Texas Academic Leadership Academy Fellow (2023), Senior Faculty Research Excellence Award from the University of Houston (2022), Highly Cited Researchers list by Clarivate Analytics (2021), Scialog Fellow on Advanced Energy Storage (2017), and the Office of Naval Research Young Investigator Award (2013). He is a Fellow of the Royal Society of Chemistry and a senior member of both the National Academy of Inventors and the IEEE. He holds 12 issued U.S. patents and has co-founded two start-ups.

Below is a summary of his most prominent achievements.

- **Multivalent Metal-ion Batteries**

  - Developed a fast-charging magnesium battery utilizing heterogeneous enolization chemistry and a weakly coordinating electrolyte (Nature Energy, 2020). Co-founded LiBeyond LLC in 2021 to commercialize this technology, securing a $3.4M ARPA-E grant for scaling up Lithium- and Transition Metal-Free High-Energy Fast-Charging Batteries.
  - Discovered a novel battery chemistry utilizing magnesium monochloride cations in expanded titanium disulfide (Nature Comm. 2017), highlighting the role of interlayer distance and chemical interactions in ion diffusion. This work was featured in the 2017 Advanced Photon Source Science Report.
  - Authored a highly cited review, "Current status and future directions of multivalent metal-ion batteries"(Nature Energy, 2020), accruing over 1,000 citations.

- **Solid-State Sodium and Lithium Batteries**

  - Pioneered tailored organic electrode materials compatible with ceramic-based solid electrolytes for all-solid-state sodium batteries (Angew. Chem. 2018, Cover). Demonstrated that soft, highly malleable organic cathode materials (e.g. pyrene-4,5,9,10-tetraone) maintain conformal interfacial contact with solid electrolytes during cycling, mitigating chemomechanical instability without high stacking pressure (Joule, 2019). This innovation has been featured by Science, UH, ChemEurope, Phys.Org among others and serves as the foundation for Scientific Thrust 2 of the DOE's Energy Storage Research Alliance (ESRA).
  - Discovered a novel oxysulfide glass electrolyte offering low cost, ease of fabrication, and exceptional mechanical and chemical stability for all-solid-state sodium batteries (Nature Comm. 2022). Employed a high-energy ball milling process to create the electrolytes at room temperature, resulting in a homogeneous glass structure. The solid electrolyte forms a self-passivating interphase, essential for reversible sodium plating and stripping. This work has been highlighted by Nature Energy, UH, Fast Company, InsideClimate News, and others.
  - Advanced organic electrode materials for all-solid-state lithium batteries (ACS Energy Lett. 2021; Joule 2021). Introducing a potential-dependent reversible interphase evolution model and emphasized the role of microstructure engineering for all-solid-state batteries. Proposed a roadmap for solid-state organic batteries to reach 500 Wh kg^{-1} (ACS Energy Lett. 2021), with this research featured in UH, Science Daily, ClimateChange, and others.

- **Aqueous Batteries**

  - Identified ultrafast proton-coupled electron transfer in quinone solids, investigated the fundamental science and molecular design for long cycle-life of aqueous batteries (Nature Materials, 2017). Secured three patents for organic anode materials in acidic, neutral, and alkaline batteries, offering sustainable alternatives to lead and metal hydride anodes. This work has accrued over 600 citations and was featured by Nature Energy, UH, New Electronics.

- Investigated charge storage mechanism in quinone polymers using electrochemical quartz crystal microbalance and in situ Fourier transform infrared spectroscopy (J. Electrochem. Soc. 2020). This study identified non-hydrated zinc ions as the key species in the quinone redox reactions.
- Published a comprehensive review on aqueous battery design (Nature Review Materials, 2022), highlighting challenges and opportunities for the field.

- **Operando Characterization Tools**

- Developed an operando SEM platform for monitoring interface evolutions during solid-state battery operation with Prof. Zheng Fan, ranked top 3 in the 2021 annual merit review of the Vehicle Technology Office (batt489). Co-founded Solid Design Instruments to commercialize this tool.
- Reported an operando reflection interference microscope with Prof. Xiaonan Shan, enabling real-time imaging of the solid–electrolyte interphase formation and evolution processes with high sensitivity (Nature Nano. 2023).

- **Organic Batteries**

- Authored widely cited reviews on organic electrodes for electrochemical energy storage (Joule 2018; Chemical Reviews, 2020), providing a critical roadmap for advancing organic battery technologies.
- Developed π-conjugated redox polymers with ultrafast energy storage capability (JACS, 2015). This work was featured as an Editors' Choice and highlighted in the JACS spotlight, UH, and others.

Awards and Recognitions

- **2025 Edith and Peter O'Donnell Award in Engineering** – TAMEST (2025)
- **Deputy Thrust Lead of Energy Storage Research Alliance** – DOE Basic Energy Science (2024)
- **Principal Investigator of Low-cost Earth-abundant Na-ion Storage (LENS) Consortium** – DOE Vehicle Technology Office (2024)
- **Career Innovator Award** – Cullen College of Engineering (2024)
- **Fellow of IAAM** (2024)
- **Invited Speaker of 2024 Batteries Gordon Research Conference** (2024)
- **Texas Academic Leadership Academy Fellow** (2023)
- **Hugh Roy and Lillie Cranz Cullen Distinguished Professor** – University of Houston (2022)
- **TAMEST Protégé Program** – TAMEST (2022)
- **Senior Level Research Excellence Award** – Cullen College of Engineering (2022)
- **Excellent Paper of the Year** – International Magnesium Society (2021)
- **Fellow of Royal Chemical Society** (2020)
- **Senior Member of National Academy of Inventors** (2020)
- **Cullen College of Engineering Professorship** – College of Engineering (2020–2022)
- **50-in-5 Scholars** – University of Houston (2021, 2020, 2019, 2018)
- **Emerging Investigators in Electrochemical Energy Conversion and Storage** – Journal of Electrochemical Energy Conversion and Storage (2020)
- **Senior Member of IEEE** (2019)
- **Top 1% Highly Cited Researchers List** – Clarivate Analytics (2018)

- **Award for Excellence in Research, Scholarship, or Creative Activity** – University of Houston (2018)
- **Scialog Fellow on Advanced Energy Storage** – Research Corporation (2017)
- **Junior Level Research Excellence Award** – University of Houston Cullen College of Engineering (2016)
- **Teaching Excellence Award** – University of Houston Cullen College of Engineering (2016)
- **Office of Naval Research Young Investigator Award** – U.S. Office of Naval Research (2013)
- **Principal Investigator** – Advanced Research Projects Agency-Energy (2013, 2015, 2022)
- **Ralph E. Powe Junior Faculty Enhancement Award** – Oak Ridge Associated Universities (2013)
- **TcSUH Welch Foundation Professorship Award** – The Welch Foundation (2012)
- **Excellence in Graduate Polymer Science Research** – American Chemical Society (2008)
- **Chinese Government Award for Outstanding Students Abroad** – Chinese Scholarship Council (2007)
- **ICI Student Award Finalist in Applied Polymer Science** –American Chemical Society (2007)
- **Dissertation Year Fellowship** – UCLA (2007)
- **Chun–Tsung Scholar** – Chun–Tsung Endowment (2000)
- **Outstanding Undergraduate Student Award** – Shanghai Education Council (2000)

Student Awards and Honors

- 2024 First place of UH-Chevron Energy Innovation Challenge, JiAn Chen and Tico Hannan
- 2024 DOE Office of Science Graduate Student Research (SCGSR) award, Leonard Jiang
- 2024 Genspiration Prize, National Academy of Inventors, JiAn Chen and Tico Hannan
- 2024 Second Prize, TcSUH 59th Student Research Symposium, Zhaoyang Chen
- 2023 Poster Award, 2nd Texas Pore Engineering Conference, Wen Ren
- 2023 UH Energy Scholars Program, Sadia Ashraf
- 2023 Third Prize, TcSUH 58th Student Research Symposium, Chaoshan Wu
- 2022 UH Postdoc Travel Award, Lihong Zhao
- 2022 TcSUH Travel Grant, Zhaoyang Chen
- 2020 Best Dissertation Award in Chemical Engineering, Karun Kumar Rao
- 2020 Houston Science Engineering Fair Second Place, Stephane Xie
- 2020 UH Provost's Undergraduate Research Scholarship, Robert Sipowicz
- 2019 Best Dissertation Award, Fang Hao
- 2019 Best Poster Award of Battery500 Review Meeting, Dieu Nguyen
- 2019 5th Solid State Battery Symposium, Best Poster Award, Yang Chen
- 2019 Best Paper Award, 235th ECS meeting Battery Division, Fang Hao
- 2019 Houston Endowment Fellowship, Dieu Nguyen
- 2019 NSF Graduate Research Fellowship, Audrey Wang
- 2019 UH Future Faculty Program Travel Award, Fang Hao
- 2019 Third Place, TcSUH 56th Student Symposium, Audrey Wang
- 2019 UH Summer Undergraduate Research Fellowship, Robert Sipowicz
- 2019 Cynthia Oliver Coleman Women in Engineering Rising Star Award, Audrey Wang

- 2019 Outstanding Senior in Electrical Engineering, Audrey Wang
- 2018 Audience Favorite Poster Award, UH Undergraduate Research Day, Audrey Wang
- 2018 Nature Conference of Electrochemistry Best Poster Award, Hui Dong
- 2017 NASA Space Technology Research Fellowship, Karun Kumar Rao
- 2017 TcSUH Travel Award, Fang Hao
- 2017 DOE Science Undergraduate Laboratory Internship, Stephanie Roohi
- 2017 Provost's Undergraduate Research Scholarship, Stephanie Roohi
- 2017 First Place, TcSUH 53rd Student Symposium, Saman Gheytani
- 2016 Best Dissertation Award, Materials Science and Engineering, Yifei Li
- 2016 Third Prize, TcSUH 52nd Student Symposium, Fang Hao
- 2016 Best Poster Award, NSF REEMS REU, Raymond McCoy
- 2016 TcSUH Travel Award, Hui Dong
- 2016 UH Future Faculty Program, Hui Dong
- 2016 Third Prize, TcSUH 51st Student Symposium, Hui Dong
- 2015 Nano Research Poster Award, Yanliang Liang
- 2015 UH Summer Undergraduate Research Fellowship, Kayshewa Champathi
- 2014 University of Nebraska-Lincoln New Venture Competition, Energetik Team
- 2014 ECE Urvish Medh Award, Yifei Li
- 2014 UH Summer Undergraduate Research Scholarship, Matthew Patton
- 2014 Third Prize, TcSUH 47th Student Symposium, Yifei Li
- 2013 UH Summer Undergraduate Research Fellowship, David Pineda

Research Funding

Ongoing Projects ($15.4M Total, External: $9.8M)

PI DOE Basic Energy Science, Title: Energy Storage Research Alliance (ESRA), Deputy Scientific Thrust Lead, Argonne National Laboratory, **$2,500,000**, Period: 11/21/2024 –12/31/2028

PI DOE Vehicle Technology Office, Title: Low-cost Earth-abundant Na-ion Storage (LENS) Consortium, **$1,000,000**, Period: 2/1/2025 –1/31/2030

PI DOE Vehicle Technology Office, Title: Battery500 Consortium: Scalable Noble-metal-free Interlayer Design for Sheet-type Dendrite-free Solid- state Lithium Metal Batteries, **$900,000**, Period: 4/24/2023 –2/24/2026

PI DOE Vehicle Technology Office, Title: Halide based superionic solid electrolytes and high voltage cathode interfaces, subaward from Oak Ridge National Lab, **$560,000**, Period: 4/26/2022 – 4/25/2027

PI DOE ARPA-E, Title: OPEN 2021 Lithium- and transition metal-free high-energy fast-charging batteries, **$3,400,000**, Period: 6/27/2022 – 6/26/2025

PI Underwriter Laboratory Research Institutes, Title: Selective membranes for magnesium-ion conduction, **$240,000**, Period: 9/01/2022 – 12/31/2024

PI University of Houston, Title: Solid-state battery prototyping facility, $**5,540,000**, Period: 10/01/2023 – 9/30/2025

PI Texas Center for Superconductivity at UH, Title: Developing all-solid-state pouch cells with anode-protecting interlayer, **$50,000**, Period: 9/01/2024 – 8/31/2025

PI Solid Power Inc., Title: Sheet-type solid-state lithium metal batteries, **$400,000**, Period: 1/01/2025 – 12/31/2026 (pending paperwork)

PI Underwriter Laboratory Research Institutes, Title: Fast-charging sodium ion batteries with non-flammable electrolyte, **$300,000**, Period: 1/01/2025 – 12/31/2026 (pending paperwork)

PI Department of Housing and Urban Development, Community Project Funding (CPF), Title: University of Houston technology bridge battery facility development, $**500,000**, Period: 10/01/2024 – 9/30/2025 (pending paperwork)

Completed Projects ($12.5M Total, $5.9M as PI)

PI Office of Naval Research Young Investigator Award, Title: Developing multivalent ion intercalation batteries as high energy and safe marine distributed power sources, **$659,883**, Period: 05/01/2013 to 04/28/2017

PI DOE ARPA-E, Title: Aqueous lithium-ion batteries with high-energy novel organic anodes for safe and robust energy storage, **$1,013,170**, Period: 11/13/2013 to 08/12/2015

PI NSF, Title: SusChEM: Design and Manufacture of Electrodes for High Energy Density Rechargeable Sodium Batteries, **$353,297**, Period: 08/15/2014 to 07/31/2017

PI DOE Vehicle Technology Office, Title: High-energy solid-state lithium batteries with organic cathode materials, **$1,200,000**, Period: 10/01/2017 to 12/31/2021

PI DOE Vehicle Technology Office, Title: Multidimensional diagnostics of interface evolutions in solid-state lithium batteries, **$1,000,000**, Period: 10/01/2019 to 03/31/2023

PI Research Corporation of Science Advancement, Title: Scialog: Advanced Energy Storage Award, $**33,334**, Period: 03/01/2018 to 08/31/2019

PI Research Corporation of Science Advancement, Title: A porosity-free sodium glass electrolyte formed at room temperature, **$55,000**, Period: 02/1/2020 to 01/31/2022

PI Argonne National Laboratory, Title: Online electrochemical mass spectroscopy studies for advanced electrolytes in lithium-ion batteries, $**54,999**, Period: 9/1/2018 to 8/31/2019

PI Chaowei Power Corporation, Title: Room temperature solid state sodium battery, **$80,000**, Period: 11/01/2018 to 5/31/2020

PI Toyota Motor Engineering & Manufacturing of North America, Title: High energy density Mg batteries using ionic liquid electrolyte, **$299,999**, Period: 2/7/2019 to 6/31/2022

PI CNPC USA, Title: Technical analysis service agreement, **$226,000**, Period: 7/1/2019 to 6/30/2021

PI Giner Inc./DOE STTR, Title: Novel separator membranes for rechargeable high energy density Mg-Ion batteries, **$80,000**, Period: 2/14/2022 – 11/13/2022

PI LiBeyond/DOE SBIR, Title: Reliable fabrication of all-solid-state lithium batteries with high cell-level specific energy, **$60,000**, Period: 6/27/2022 – 4/26/2023

Co-PI Office of Naval Research, Title: DURIP: Physical property measurement system, **$810,000**, Period: 08/15/2015 to 08/15/2016

Co-PI DOE ARPA-E, OPEN 2015, Title: Low-cost, low-temperature, safe, high-energy-density solid-state Na batteries made from renewable materials, **$3,277,744**, Period: 06/01/2016 to 06/30/2018

Co-PI NASA, Graduate Student Fellowship for Karun Kumar Rao, **$286,642**, Period: 08/01/2017 to 12/16/2020

Co-PI Office of Naval Research, Title: DURIP: Micro-Computed Tomography (Micro-CT) for Non-destructive Evaluation of Advanced Materials and Devices for Defense Applications, **$904,554**, Period: 09/16/2020 to 09/15/2021

PI Texas Center for Superconductivity Funding, **$553,500**, Period: 09/1/2012 to 8/31/2024

PI University of Houston, Title: Tech Gap Fund 2018, **$26,595**, Period: 10/01/2018 to 10/1/2019

PI University of Houston, Title: Large Equipment Program: Acquisition of an atomic layer deposition system to support institutional thrusts on cyber and physical security, accessible healthcare, drug discovery and development, UH, **$124,964**, Period: 4/16/2018 to 4/15/2019

Co-PI University of Houston, Title: National Centers Planning Award, Houston Center for Advanced Materials and Manufacturing (H-CAMM), **$98,053**, Period: 3/15/2022 – 12/31/2022

Co-PI University of Houston, Title: GEAR, Chemistry Informed Deep Learning Based Battery Degradation Modeling for Microgrid Management (PI: Xingpeng Li), **$38,308**, Period: 5/15/2022 – 12/15/2023

PI Facebook, Title: Bioderived and biodegradable redox polymers for flexible wearable batteries, **$150,000**, Period: 4/1/2022 – 9/30/2024

PI University of Houston, Title: SEED Grant: Ultrasonic based monitoring and characterization of Li-metal batteries, **$70,000**, Period: 6/01/2022 – 8/31/2024

PI University of Houston, Title: Large Equipment Program: Acquisition of a warm isostatic press to support on sustainable communities and infrastructure and energy security and transition, **$112,250**, Period: 4/1/2022 – 8/31/2024

Professional Services

- **Editorial Advisory Board**
  - Energy & Fuels, ACS (2023−Present)
  - Sustainable Energy & Fuels, Royal Society of Chemistry (2023−Present)
  - Next Energy, Elsevier (2022−Present)
  - eScience, KeAi (2020−Present)
  - Scientific Reports, Nature Publishing Group (2014−2018)
  - Guest editor of Special Issue of Organic Batteries, Batteries & Supercaps (2023)
  - Guest editor of Special Issue of Energy Storage: Rechargeable Batteries Beyond Organic Electrolytes, Current Opinion in Electrochemistry (2021)
  - Guest editor of Special Issue of Organic Batteries, ChemSusChem (2020)

- **Professional Memberships and Service**
  - Board member, NATTBatt Sodium-ion Battery Committee (2023−Present)
  - Board member, Organic Battery Days (2017−Present)
  - Board member, Molecular Foundry's Proposal Review Board (2024−Present)
  - Electrochemical Society Battery Division Member (2012−Present)
  - Materials Research Society (MRS) Member (2012−Present)
  - Materials Research Society Student Award Committee (2019)
  - Fellow of Royal Society of Chemistry (UK) (2019−Present)
  - Senior Member of Institute of Electrical and Electronics Engineers (IEEE) (2013−Present)

- Treasurer, IEEE Nanotechnology Council Houston Chapter (2015−Present)
- Senior Member, National Academy of Inventors (NAI) (2019−Present)

- **US Department of Energy Proposal Reviewer**
  - EERE, Vehicle Technology Office Annual Review (2024, 2023)
  - EERE, Office of Electricity Energy Storage Program (2023, 2021)
  - EERE, Office of Advanced Materials and Manufacturing Technologies Office (2023)
  - MESC, Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing (2024, 2022)
  - BES, Chemical and Materials Sciences to Advance Clean Energy Technologies and Low-Carbon Manufacturing (2022)
  - BES, Battery Innovation Hub ($120M program) reviewer (2021)
  - BES, Energy Frontier Research Center ($16M program) (2018)
  - BES, Materials Chemistry Program (2023, 2022, 2019)
  - SBIR/STTR (2023, 2020, 2019)

- **US National Science Foundation Proposal Reviewer**
  - DMREF, Battery Science (2023)
  - DMR, Electronics/Photonics Materials (2022)
  - CBET, Electrochemical Systems (2020)

- **Other US Funding Agency**
  - ACS Petroleum Research Fund (2014−2020)
  - NASA Graduate Student Fellowship (2018)
  - NASA EPSCoR Proposal (2015)
  - AAAS on an Indo-US Joint Center on Solar Cells (2015)

- **International Funding Agency**
  - European Research Council Priority Grant (2023)
  - Germany Science Foundation (DFG) "Polymer-based batteries" priority program (2023)
  - Canada Ontario Research Fund (2022)
  - German-Israel Electrochemistry Proposal (2017)
  - European Research Council (2015)

- **Academic External Reviewer**
  - Nanyang Technology University proposal (2021)
  - City University of New York proposal (2021)
  - Hong Kong Polytechnic University proposal (2021)
  - Nazarbayev University Proposal (2019, 2020)
  - Qiu Shi Outstanding Young Scholar Award Committee (2017, 2019)
  - University of Maryland Industrial Partnership Program (2018)
  - Kentucky Science and Technology Corp. Proposal (2017)
  - Tenure and promotion candidate, Dartmouth College (2023)
  - Tenure and promotion candidate, University of Alberta (2023)
  - Tenure and promotion candidate, National University of Singapore (2023)
  - Tenure and promotion candidate, Washington University in St. Louis (2022)
  - Tenure and promotion candidate, University of Alberta (2022)
  - Tenure and promotion candidate, Ohio State University (2022)
  - Tenure and promotion candidate, Hong Kong University of Science and Technology (2022)

- **Manuscript Reviewer for Journals** (2012−Present)
  Science, Nature, Nature Energy, Nature Materials, Nature Nanotechnology, Nature Sustainability, Nature Communications, Science Advances, Chemical Society Reviews, Chemical Reviews, Journal of American Chemical Society, Angewandte Chemie International Edition, Proceeding of the National Academy of Sciences, Energy and Environmental Science, Matter, Chem, Joule, Materials Today, Advanced Materials, Advanced Energy Materials, Advanced Functional Materials, ACS Energy Letters, ACS Materials Letters, ACS Nano, ACS Polymer Materials, Chemistry of Materials, Chemical Science, Cell Reports Physical Science, Electrochimica Acta, Energy Storage Materials, Journal of Materials Chemistry A, Nano Energy, Nano Letters, Nano Research, Scientific Reports, Small, Small methods.

- **Service to Electrochemical Society** University of Houston Student Chapter, Faculty Advisor (2016−Present)
  - 2017 ECS Grilling for Good Grades Event
  - 2017 ECS seminar speaker Dr. Kang Xu from Army Research Laboratory
  - 2019 ECS UH poster competition
  - 2022 Organic Battery Days workshop, highlighted at the Winter 2022 issue of Interface
  - 2023 ECS seminar speaker Dr. Sergiy Kalnaus from Oak Ridge National Laboratory
  - 2023 Na-Zn workshop with NATTBatt

- **Organizer of Professional Conferences**
  - Program Committee Topic Area Lead, Division of Energy & Fuels (ENFL), American Chemical Society (2024−Present)
  - Symposium Co-Organizer, MRS Spring Meeting, “Solid State Batteries”, Seattle, WA (2024)
  - Conference Co-Organizer, NATTBatt Sodium and Zinc Battery Workshop, Houston, TX, USA (11/30-12/1/2023)
  - Chair, Organic Battery Days 2022, Houston, TX, USA (2022)
  - Conference Co-Organizer, Organic Battery Days, Tianjin, China (2018)
  - Conference Organizer, Nature Conference on Materials Electrochemistry: Fundamentals and Applications, Shenzhen, China (2018)
  - Symposium Co-Organizer, MRS Spring, “Organic Materials in Electrochemical Energy Storage”, Phoenix, AZ (2019)
  - Symposium Co-Organizer, European Materials Research Society, “Frontiers in Electrochemical Energy Storage”, Strasbourg, France (2017)
  - Symposium Co-Organizer, Electrochemical Society, “Electrochemistry and Batteries for Safe and Low-cost Energy Storage”, 229th ECS meeting, San Diego, CA (2016)
  - Symposium Co-Organizer, International Materials Research Congress, “Materials and Technologies for Stationary Electrochemical Energy Storage”, Cancun, Mexico (2016)
  - Symposium Lead-Organizer, MRS Fall, “Materials and Architectures for Safe and Low-cost Electrochemical Energy Storage Technologies”, Boston, MA (2015)
  - Symposium Co-Organizer TMS, “Nanostructured Materials for Rechargeable Batteries and for Supercapacitors III”, Orlando, FL (2015)
  - Symposium Co-Organizer, ACS, “Batteries and Fuel Cell Technologies: Challenges and Solutions, San Francisco, CA (2014)

- **Institutional Service**
  - Member of University of Houston Faculty Senate (2019−2022, 2023−Present)
  - Member of University Graduate & Professional Studies Committee (2019−2022, 2023−Present)
  - Member of University Intellectual Property Committee (2020−2023)
  - Cullen College of Engineering Promotion and Tenure Committee (2021, 2022, 2023)
  - Cullen College of Engineering Best Dissertation Award Committee (2019)
  - Shell Endowed Chair Search Committee Member (2024)
  - ECE Provost Future Faculty Search Committee Chair (2024)
  - ECE Faculty Search Committee Chair (2022, 2023)
  - ECE Post-tenure Review Committee (2020−2023)
  - ECE Faculty Governance Committee (2019−2022)
  - ECE Graduate Admission Committee (2014−Present)
  - Co-Director, Power electronics-Energy storage-Microgrids and Subsea Electrical Consortium (PEMSEC) at the University of Houston (2018−2022)

- **Outreach activities**
  - Served as Grand Award judge for Regeneron International Science and Engineering Fair (ISEF) (2024)
  - Advisor for 7 high school students conducting 6-week summer research (2024, 2023, 2013)
  - Host undergraduate summer research for Energy Scholar (2023)
  - NASA High School Aerospace Scholars (HAS) lab tour with hands-on activity (2019)
  - Program for Mastery in Engineering Studies (PROMES) Engineering Summer Camp lab tour with hands-on activity (2019)
  - NSF REU lab tour (2019)
  - Lemelson-MIT InvenTeams lab tour (2017)
  - Science and Engineering Fair of Houston judge (2022, 2021, 2020, 2016, 2015, 2013)
  - International Sustainable World (Energy, Engineering & Environment) Project Olympiad (I-SWEEEP) International Science Fair judge (2017, 2014)

Publications

(a) Ten Most Cited Publications (since Dr. Yao's independent career)

1. Universal quinone electrodes for long cycle life aqueous rechargeable batteries. Y. Liang, Y. Jing, S. Gheytani, K.Y. Lee, P. Liu, A. Facchetti*, Y. Yao*, *Nature Materials* 2017, *16*, 841-848. https://www.nature.com/articles/nmat4919 (cited 704 times)
2. Interlayer-expanded molybdenum disulfide nanocomposites for electrochemical magnesium storage. Y. Liang, H. D. Yoo, Y. Li, J. Shuai, H. A. Calderon, F. R. Hernandez, L. C. Grabow, Y.Yao*, *Nano Letters* 2015, *15*, 2194-2202. https://pubs.acs.org/doi/abs/10.1021/acs.nanolett.5b00388 (cited 423 times)
3. Fast kinetics of magnesium monochloride cations in interlayer-expanded titanium disulfide for magnesium rechargeable batteries. H. D. Yoo, Y. Liang, H. Dong, J. Lin, H. Wang, Y. Liu, L. Ma, T. Wu, Y. Li, Q. Ru, Y. Jing, Q. An, W. Zhou, J. Guo, J. Lu, S. T. Pantelides, X. Qian, Y. Yao*, *Nature Comm.* 2017, *8*, 339. https://www.nature.com/articles/s41467-017-00431-9 (cited 359 times)

4. High-power Mg batteries enabled by heterogeneous enolization redox chemistry and weakly coordinating electrolytes. H. Dong, O. Tutusaus, Y. Liang, Y. Zhang, Z. Lebens-Higgins, W. Yang, R. Mohtadi*, Y. Yao* *Nature Energy* 2020, *5*, 1043-1050. https://www.nature.com/articles/s41560-020-00734-0 (cited 251 times)

5. Heavily n-dopable π-conjugated redox polymers with ultrafast energy storage capability" Y. Liang, Z. Chen, Y. Jing, Y. Rong, A. Facchetti*, Y. Yao*, *J. Am. Chem. Soc*., 2015, *137*, 4956-4959. https://pubs.acs.org/doi/full/10.1021/jacs.5b02290 (cited 295 times)

6. Tailored organic electrode material compatible with sulfide electrolyte for stable all-solid-state sodium batteries" X. Chi, Y. Liang, F. Hao, Y. Zhang, J. Whiteley, H. Dong, P. Hu, S. Lee, Y. Yao*, *Angewandte Chemie Int. Ed.* 2018, *130*, 2660-2264. https://onlinelibrary.wiley.com/doi/10.1002/anie.201712895 (cited 167 times)

7. An aqueous Ca-ion battery" S. Gheytani, Y. Liang, F. Wu, Y. Jing, H. Dong, K. K. Rao, X. Chi, F. Fang*, Y. Yao*. *Advanced Science* 2017, 1700465. https://onlinelibrary.wiley.com/doi/10.1002/advs.201700465 (cited 293 times)

8. Current status and future directions of multivalent-ion batteries. Y. Liang, H. Dong, D. Aurbach*, Y. Yao*, *Nature Energy* 2020*, 5,* 646-656. https://www.nature.com/articles/s41560-020-0655-0 (cited 1,043 times)

9. Positioning organic electrode materials in the battery landscape" Y. Liang, Y. Yao*, *Joule* 2018, *2*, 1690-1706. https://www.cell.com/joule/fulltext/S2542-4351(18)30294-0 (cited 362 times)

10. Designing modern aqueous batteries. Y. Liang, Y. Yao*, *Nature Review Materials* 2022, *8*, 109-122. https://www.nature.com/articles/s41578-022-00511-3 (Cited 322 times)

(b) Journal Articles: 150+ peer-reviewed papers in prestigious scientific journals including *Nature (x2), Nature Rev. Mater. (x1), Nature Energy (x3), Nature Mater. (x2), Nature Nano. (x2), Joule (x4), JACS (x5), Nature Comm. (x5), Adv. Mater. (x3), ACS Energy Lett. (x4), Nano Lett. (x5), ACS Nano (x5), Nano Energy (x9), et al.* According to Google Scholar, his work has received over 37,087 citations with an h-index of 76 as on 10/1/2024.

1. Jianbin Zhou, Shen Wang, Chaoshan Wu, Ji Qi, Hongli Wan, Shen Lai, Shijie Feng, Tsz Wai Ko, Zhaohui Liang, Ke Zhou, Nimrod Harpak, Nick Solan, Mengchen Liu, Zeyu Hui, Paulina J. Ai, Kent Griffith, Chunsheng Wang,* Shyue Ping Ong,* **Yan Yao**,* Ping Liu,* *Superionic surface Li-ion transport in carbonaceous materials*, **Nature Energy**, revision,

2. Zhaoyang Chen, Qing Ai, Alae Eddine Lakraychi, Chaoshan Wu, Lihong Zhao, Liqun Guo,Viktor G. Hadjiev, Hua Guo, Zheng Fan, Jun Lou, Yanliang Liang,* **Yan Yao,*** *Manipulating Hardness to Construct Favorable Electrode Microstructures for All-Solid-State Batteries*, **Advanced Energy Materials**, 2024, 2403050. (Journal Front Cover)

3. Wenyue Ding, Josiah Hanson, Yi Shi, **Yan Yao**, Megan L. Robertson*, *Enhancing Mechanical Properties of Sustainable Thermoplastic Elastomers through Incorporating Ionic Interactions*, **Macromolecules**, 2024, 57, 8306-8319.

4. Jianbin Zhou, Manas Likhit Holekevi Chandrappa, Sha Tan, Shen Wang, Chaoshan Wu, Howie Nguyen, Canhui Wang, Haodong Liu, Sicen Yu, Quin R. S. Miller, Gayea Hyun, John Holoubek, Junghwa Hong, Yuxuan Xiao, Charles Soulen, Zheng Fan, Eric E. Fullerton, Christopher J. Brooks, Chao Wang, Raphaële J. Clément, **Yan Yao**, Enyuan Hu, Shyue Ping Ong*, Ping Liu*, *Healable and conductive sulfur iodide for solid-state Li–S batteries*. **Nature**, 2024, 627, 301-305.

5. Jian Chen, Thomas Hannan, **Yan Yao**,* Gangbing Song,* *Estimating state of charge of cylindrical lithium-ion cells using multiple random convolutional kernel transform and low-frequency stress waves*, **Energy Storage Materials**, 2024, 72, 103730.

6. Ruqing Fang, Wei Li, Junning Jiao, Lihong Zhao, Yan Yao, Juner Zhu,* *Modeling the electro-chemo-mechanical failure at the lithium-solid electrolyte interface: Void evolution and lithium penetration*, **Journal of the Mechanics and Physics of Solids**, 2024, 192, 105799.

7. Lin Ma*, Travis P. Pollard, Marshall A. Schroeder*, Chao Luo, Ye Zhang, Glenn Pastel, Longsheng Cao, Jiaxun Zhang, Vadim Shipitsyn, **Yan Yao**, Chunsheng Wang, Oleg Borodin* and Kang Xu*, *Engineering a zinc anode interphasial chemistry for acidic, alkaline and non-aqueous electrolytes*. **Energy & Environmental Science**, 2024, 17, 2468-2479.

8. Gaoliang Yang, Yuanjian Li, Jianbiao Wang, Yawei Lum, Carina Lim, Man-Fai Ng, Chang Zhang, Zhi Chang, Zhonghan Zhang, Albertus D. Handoko, Tanmay Ghosh, Shuzhuo Li, Zdenek Sofer, Wei Lu, **Yan Yao***, Zhi Wei Seh*, *Realizing horizontal magnesium platelet deposition and suppressed surface passivation for high-performance magnesium metal batteries*, **Energy & Environmental Science**, 2024, 17, 1141-1152.

9. Sandesh Risal, Navdeep Singh*, Yan Yao, Li Sun, Samprash Risal, and Weihang Zhu*, *Accelerating Elastic Property Prediction in Fe-C Alloys through Coupling of Molecular Dynamics and Machine Learning*, **Materials**, 2024, 17, 601.

10. Alae Eddine Lakraychi, Erin Picton, Yanliang Liang, Devin Shaffer*, **Yan Yao***, *Suppressing Shuttle Effect with a Size-selective Covalent Organic Framework Based Bilayer Membrane*, **ACS Energy Lett**. 2023, 8, 5032-5040.

11. Hua Xie, Ning Liu, Qian Zhang, Hongtao Zhong, Liqun Guo, Xinpeng Zhao, Daozheng Li, Shufeng Liu, Zhennan Huang, Aditya Dilip Lele, Alexandra H. Brozena, Xizheng Wang, Keqi Song, Sophia Chen, **Yan Yao**, Miaofang Chi, Wei Xiong, Jiancun Rao, Minhua Zhao, Mikhail N. Shneider, Jian Luo, Ji-Cheng Zhao*, Yiguang Ju*, Liangbing Hu* *A stable atmospheric-pressure plasma for extreme-temperature synthesis*, **Nature**, 2023, 623, 964.

12. Lihong Zhao, Wei Li, Chaoshan Wu, Qing Ai, Liqun Guo, Zhaoyang Chen, Jie Zheng, Matthew Anderson, Hua Guo, Jun Lou, Yanliang Liang, Zheng Fan, Juner Zhu, **Yan Yao***, *Taming metal-solid electrolyte interface instability via metal strain hardening*. **Advanced Energy Materials**, 2023, 2300679.

13. Benjamin Emley, Chaoshan Wu, Lihong Zhao, Qing Ai, Yanliang Liang, Zhaoyang Chen, Liqun Guo, Tanguy Terlier, Jun Lou, Zheng Fan*, and **Yan Yao***, *Impact of fabrication methods on binder distribution and charge transport in composite cathodes of all-solid-state batteries*, **Materials Future**, 2023, 2, 045102. Focus Issue on Solid State Batteries.

14. Liqun Guo, Jie Zheng, Lihong Zhao*, **Yan Yao***, *Interfacial instabilities in halide-based solid-state batteries*, **MRS Bulletin**, 2023, 48, 1247-1256.

15. Hongzhi Zheng, Huan Li, Zisheng Zhang, Xiaojun Wang, Benjamin Emley, Ye Zhang, Hua Zhou, **Yan Yao*** and Yongye Liang*, *Dispersed nickel phthalocyanine molecules on carbon nanotubes as cathode catalysts for Li-CO_2 batteries*. **Small**, 2023, 2302768.

16. Alae Eddine Lakraychi, **Yan Yao***, *Designing organic pseudocapacitors through molecular hybridization*. **Joule**, 2023, 7, 858-860.

17. Chaoshan Wu*, Benjamin Emley*, Lihong Zhao, Yanliang Liang, Qing Ai, Zhaoyang Chen, Francisco C Robles Hernández, Fei Wang, Samprash Risal, Hua Guo, Jun Lou, **Yan Yao***, Zheng Fan*, *Understanding the chemomechanical function of silver-carbon interlayer in sheet-type all-solid-state lithium-metal batteries*. **Nano Lett.**, 2023, 23, 4415-4422.

18. Jianing Meng, Alexandra Robles, Jacobo Jalife Said, Wen Ren, Ye Zhang, Lihong Zhao, Yanliang Liang*, Judy Wu*, Ognjen Miljanić*, **Yan Yao***, *Cyclotetrabenzil derivatives for electrochemical lithium-ion storage*. **Angewandte Chemie**, 2023, e202300892.

19. Samprash Risal, Chaoshan Wu, Fei Wang, Sandesh Risal, Francisco C Robles Hernandez, **Yan Yao***, and Zheng Fan*, *Silver-carbon interlayers in anode-free solid-state lithium metal batteries: current development, interfacial issues and instability challenges*. **Carbon**, 2023, 213, 118225.

20. Sandesh Risal, Navdeep Singh*, Andrew Ian Duff, **Yan Yao**, Li Sun, Samprash Risal, Weihang Zhu*, *Development of RF-MEAM interatomic potential for Fe-C system to study temperature dependent elastic properties*, **Materials**, 2023, 16, 3779

21. Guangxia Feng, Hao Jia, Yaping Shi, Xu Yang, Yanliang Liang, Mark H. Engelhard, Ye Zhang, Chaojie Yang, Kang Xu*, **Yan Yao***, Wu Xu*, Xiaonan Shan*, *Imaging solid-electrolyte-interphase dynamics using in-operando reflection interference microscopy*, **Nature Nanotechnology**, 2023, 18, 780-789.

22. Qing Ai, Zhaoyang Chen, Boyu Zhang, Fan Wang, Tianshu Zhai, Yifeng Liu, Yifan Zhu, Tanguy Terlier, Qiyi Fang, Yanliang Liang, Lihong Zhao, Chaoshan Wu, Hua Guo*, Zheng Fan, Ming Tang, **Yan Yao***, Jun Lou*, *High-spatial-resolution quantitative chemo-mechanical mapping of organic composite cathodes for sulfide-based solid-state batteries*, **ACS Energy Letters**, 2023, 8, 1107-1113.

23. Kang Wang, Zih-Yu Lin, Zihan Zhang, Linrui Jin, Ke Ma, Aidan H. Coffey, Harindi R. Atapattu, Yao Gao, Jee Yung Park, Zitang Wei, Blake P. Finkenauer, Chenhui Zhu, Xiangeng Meng, Sarah N. Chowdhury, Zhaoyang Chen, Tanguy Terlier, Thi-Hoai Do, **Yan Yao**, Kenneth R. Graham, Alexandra Boltasseva, Tzung-Fang Guo, Libai Huang, Hanwei Gao, Brett M. Savoie, Letian Dou*, *Suppressing phase disproportionation in quasi-2D perovskite light-emitting diodes*, **Nature Comm.**, 2023, 14, 397.

24. Minghui Ning, Yu Wang, Libo Wu, Lun Yang, Zhaoyang Chen, Shaowei Song, **Yan Yao**, Jiming Bao, Shuo Chen*, Zhifeng Ren*, *Hierarchical Interconnected NiMoN with Large Specific Surface Area and High Mechanical Strength for Efficient and Stable Alkaline Water/Seawater Hydrogen Evolution*, **Nano-Micro Letters**, 2023, 15, 157.

25. Alexandru Vlad*, Jun Chen*, and **Yan Yao***, *Organic electrode materials and engineering for electrochemical energy storage*, **Batteries & Supercaps**, 2023, 6, e202300090.

26. Yanliang Liang, **Yan Yao***, *Designing modern aqueous batteries*, **Nature Rev. Mater.** 2022, 8, 109-122.

27. Qi Dong, Xin Zhang, Ji Qian, Shuaiming He, Yimin Mao, Alexandra H. Brozena, Ye Zhang, Travis P. Pollard, Oleg A. Borodin, Yanbin Wang, Bhargav Sai Chava, Siddhartha Das, Peter Zavalij, Carlo U. Segre, Dongyang Zhu, Lin Xu, Yanliang Liang, Yan Yao, Robert M. Briber, Tian Li*, Liangbing Hu*, *A cellulose-derived supramolecule for fast ion transport*, **Science Advances**, 2022, 8, eadd2031.

28. Meiling Wu, Ye Zhang, Lin Xu, Chunpeng Yang, Min Hong, Mingjin Cui, Bryson C. Clifford, Shuaiming He, Shuangshuang Jing, **Yan Yao***, and Liangbing Hu*, *A sustainable chitosan-zinc electrolyte for high-rate zinc metal batteries*, **Matter,** 2022, 5, 3402-3416.

29. Xiaowei Chi, Ye Zhang, Fang Hao, Steven Kmiec, Hui Dong, Rong Xu, Kejie Zhao, Liang Wang, Lihong Zhao, Liqun Guo, Huolin Xin, Steve W. Martin*, **Yan Yao***, *An electrochemically stable defect-free glassy electrolyte formed at room temperature for all-solid-state sodium batteries*, **Nature Comm.**, 2022, 13, 2854.

30. Zhaoyang Chen, **Yan Yao***, *Ultrahigh energy density Li-organic primary batteries*, **Energy & Environmental Materials**, 2022, 5, 1010-1011.

31. Jang Wook Choi*, **Yan Yao***, *Editorial overview: Energy storage: rechargeable batteries and supercapacitors (2022) beyond organic electrolytes*, **Current Opinion in Electrochemistry**, 2022, 36, 101157.

32. Peixun Xiong, Ye Zhang, Jingran Zhang, Sang Ha Baek, Lingxing Zeng, **Yan Yao**, Ho Seok Park*, *Recent progress of artificial interfacial layers in aqueous Zn metal batteries*, **Energy Chem**, 2022, 4, 100076.

33. Xiaojun Wang, Hui Dong, Alae Eddine Lakraychi, Ye Zhang, Xu Yang, Hongzhi Zheng, Xinpeng Han, Xiaonan Shan, Chuanxin He*, **Yan Yao***, *Electrochemical swelling induced high material utilization of porous polymers in magnesium electrolytes*, **Materials Today**, 2022, 55, 29-36.

34. Ye Zhang, Lihong Zhao, Yanliang Liang, Xiaojun Wang, **Yan Yao***, *Effect of electrolyte anions on the cycle life of a polymer electrode in aqueous batteries*, **eScience**, 2022, 2, 110-115.

35. Maureen Kitheka, Morgan Redington, Jibo Zhang, **Yan Yao**, Puja Goyal*, *Density functional tight-binding method for redox, protonation and electronic properties of quinones*, **Physical Chemistry Chemical Physics**, 2022, 24, 6742-6756.

36. Ye Zhang, Guang Yang, Michelle L. Lehmann, Chaoshan Wu, Lihong Zhao, Tomonori Saito, Yanliang Liang,* Jagjit Nanda,* **Yan Yao***, *Separator effect on zinc electrodeposition behavior and its implication for zinc battery lifetime*, **Nano Lett.** 2021, 21, 10446-10452.

37. Lihong Zhao, Alae Eddine Lakraychi, Zhaoyang Chen, Yanliang Liang, **Yan Yao***, *Roadmap of solid-state lithium-organic batteries towards 500 Wh kg^{-1}*, **ACS Energy Letters**, 2021, 6, 3287-3306.

38. Riya A. Mathew, Gang Wu, Ye Zhang, Sheyda Shakiba, **Yan Yao**, Ah-Lim Tsai, and Stacey M. Louie*, *Natural organic matter adsorption conditions influence photocatalytic reaction pathways of phosphate-treated titanium dioxide nanoparticles*, **Environ. Sci.: Nano**, 2021, 8, 2165-2176.

39. Jibo Zhang, Zhaoyang Chen, Qing Ai, Tanguy Terlier, Fang Hao, Yanliang Liang, Hua Guo, Jun Lou, **Yan Yao***, *Microstructure engineering of solid-state composite cathode via solvent-assisted processing*, **Joule**, 2021, 5, 1845-1859.

40. Chaoshan Wu, Jiatao Lou, Jun Zhang, Zhaoyang Chen, Akshay Kakar, Benjamin Emley, Qing Ai, Hua Guo, Yanliang Liang, Jun Lou, **Yan Yao***, Zheng Fan*, *Current status and future directions of all-solid-state batteries with lithium metal anodes, sulfide electrolytes, and layered ternary oxide cathodes*, **Nano Energy**, 2021, 106081.

41. Kui Li, Weitian Zheng, Hongzhi Zheng, Xiaojun Wang, Zhiqiang Xie, Lei Ding, Shule Yu, **Yan Yao***, Fengyuan Zhang*, *Visualizing highly selective electrochemical CO2 reduction on a molecularly dispersed catalyst*, **Materials Today Physics**, 2021, 19, 100427.

42. Benjamin Emley, Yanliang Liang*, Rui Chen, Chaoshan Wu, Miao Pan, Zheng Fan, **Yan Yao***, *On the quality of tape-cast thin films of sulfide electrolytes for solid-state batteries*, **Materials Today Physics**, 2021, 18, 100397.

43. Fang Hao, Yanliang Liang, Ye Zhang, Zhaoyang Chen, Jibo Zhang, Qing Ai, Hua Guo, Zheng Fan, Jun Lou, **Yan Yao***, *High-energy all-solid-state organic–lithium batteries based on ceramic electrolytes*, **ACS Energy Letters**, 2021, 6, 201-2017.

44. Zhe Liu, Yunsong Li,Yanzhou Ji, Qinglin Zhang, Xingcheng Xiao, **Yan Yao**, Long-Qing Chen*, Yue Qi*, *Dendrite-free lithium based on lesson learned from lithium and magnesium electrodeposition morphology simulations*, **Cell Reports Physical Science**, 2021, 2, 100294.

45. Hui Dong, Oscar Tutusaus, Yanliang Liang, Ye Zhang Zachary Lebens-Higgins, Wanli Yang, Rana Mohtadi*, **Yan Yao***, *High-power Mg batteries enabled by heterogeneous enolization redox chemistry and weakly coordinating electrolytes*, **Nature Energy**, 2020, 5, 1043-1050.

46. Tingting Liu, Ye Zhang, Chien-Hung Li, Maria D. Marquez, Hung-Vu Tran, Francisco C. Robles Hernández, **Yan Yao***, T. Randall Lee*, *Semi-hollow core-shell nanoparticles with porous SiO2 shells*

encapsulating elemental sulfur for lithium-sulfur batteries, **ACS Applied Materials & Interfaces**, 2020, 12, 47368–47376.

47. Muqing Ren, Hongzhi Zheng, Jincheng Lei, Jibo Zhang, Xiaojun Wang, Boris I. Yakobson*, **Yan Yao***, James M. Tour*, *CO_2 to formic acid using Cu-Sn on laser-induced graphene*, **ACS Applied Materials & Interfaces**, 2020, 12, 41223-41229.

48. Karun K. Rao, **Yan Yao**, Lars C. Grabow*, *Accelerated modeling of lithium diffusion in solid state electrolytes using artificial neural networks*, **Advanced Theory and Simulations**, 2020, 3, 2000097.

49. Yanliang Liang, Hui Dong, Doron Aurbach*, **Yan Yao***, *Current status and future directions of multivalent-ion batteries*, **Nature Energy** 2020*, 5,* 646-656.

50. Ye Zhang, Yanliang Liang, Hui Dong, Xiaojun Wang, **Yan Yao***, *Charge storage mechanism of a quinone polymer electrode for zinc-ion batteries*, **Journal of the Electrochemical Society** 2020, *167,* 070558.

51. Philippe Poizot*, Joël Gaubicher, Stéven Renault, Lionel Dubois, Yanliang Liang, **Yan Yao**, *Opportunities and challenges for organic electrodes in electrochemical energy storage*, **Chemical Reviews**, 2020, *120*, 6490-6557.

52. Zhiqi Hu, Changxu Sun, Jinhan Lin, Joshua Jackson, Tanguy Terlier, Damilola Owolabi, Hao Mei, Yilin Li, Yafei Wang, Siraj Sidhik, Fang Hao, **Yan Yao**, Aditya D. Mohite, Rafael Verduzco*, *Improved mechanical durability of high performance OPVs using semi-interpenetrating networks*, **Advanced Optical Materials**, 2020, *8*, 200516.

53. Zhaojun Qin, Shenyu Dai, Chalapathi Charan Gajjela, Chong Wang, Viktor G. Hadjiev, Guang Yang, Jiabing Li, Xin Zhong, Zhongjia Tang, **Yan Yao**, Arnold M. Guloy, Rohith Reddy, David Mayerich, Liangzi Deng, Qingkai Yu, Guoying Feng, Hector A. Calderon, Francisco C. Robles Hernandez, Zhiming M. Wang*, and Jiming Bao*, *Spontaneous Formation of 2D/3D Heterostructures on the Edges of 2D Ruddlesden–Popper Hybrid Perovskite Crystals*, **Chem. Mater.**, 2020, *32*, 5009-5015.

54. Yan Jing, Yanliang Liang, Saman Gheytani, **Yan Yao***, *A quinone anode for lithium-ion batteries in mild aqueous electrolytes*, **ChemSusChem** 2020, *13*, 2250-2255.

55. Philippe Poizot*, **Yan Yao***, Jun Chen*, Ulrich S. Schubert*, *Preface to the special issue of ChemSusChem on Organic batteries*, **ChemSusChem**, 2020, *13*, 2107-2109.

56. Benjamin Emley, Dhruba Panthi, Yanhai Du, **Yan Yao***, *Controlling porosity of anode support in tubular solid oxide fuel cells by freeze casting*, **Journal of Electrochemical Energy Conversion and Storage** 2020, *17*, 041106.

57. Muring Ren, Jibo Zhang, Chenhao Zhang, Michael Stanford, Yieu Chyan, **Yan Yao***, James Tour*, *Quasi-solid-state Li-O_2 batteries with laser-induced graphene cathode catalysts,* **ACS Applied Energy Materials** 2020, *3*, 1702-1709.

58. Liqin Zhou, Chen Ling*, Hui Zhou, Xiang Wang, Joseph Liao, Gunugunuri K. Reddy, Ruigang Zhang, M. Stanley Whittingham, Chongmin Wang, **Yan Yao** and Hongfei Jia, *Brownmillerite Sr_2GaCoO_5 as oxygen evolution catalyst in neutral solution enables sunlight-driven CO_2 reduction at 13.9% energy-conversion efficiency*, **Nature Comm.** 2019, *10*, 4081.

59. Yi Shi, Yang Chen, Yanliang Liang, Hui Dong, Mengying Yuan, Wenyue Ding, Haleh Ardebili, Megan L. Robertson, Xiaoli Cui, and **Yan Yao***, *Chemically inert covalently networked all-solid polymer electrolytes for lithium metal batteries*, **J. Mater. Chem. A**, 2019, *7*, 19691-19695.

60. Xiuzhen Wang, Zhenpeng Yao, Sooyeon Hwang, Ying Pan, Hui Dong, Maosen Fu, Na Li, Ke Sun, Hong Gan, **Yan Yao**, Alán Aspuru-Guzik, Qingyu Xu*, Dong Su*, *In situ electron microscopy investigation of sodiation of titanium disulfide nanoflakes*, **ACS Nano** 2019, *13*, 9421-9430.

61. Yanan Wang, Chong Wang, Xinghua Su, Viktor G. Hadjiev, Shengyu Dai, Zhaojun Qin, Hector A Calderon Benavides, Yizhou Ni, Qiang Li, Jie Jian, Md Kamrul Alam, Haiyan Wang, Francisco C. Robles-Hernandez, **Yan Yao**, Shuo Chen, Qingkai Yu, Guoying Feng, Zhiming Wang*, Jiming Bao*, *Extrinsic green photoluminescence from the edges of two-dimensional cesium lead halides*, **Adv. Mater.** 2019, *31*, 1902492.

62. Zhizhang Yuan, Yanbin Yin, Congxin Xie, Huamin Zhang, **Yan Yao**, Xianfeng Li*, *Advanced materials for zinc-based flow battery: development and challenges*, **Adv. Mater.** 2019, *31*, 1902025.

63. Aniruddha M. Dive, Ye Zhang, **Yan Yao**, Steve Martin, Soumik Banerjee*, *Investigating the structure of $Na_2S + P_2S_5$ glassy electrolytes and its impact on Na^+ ionic conductivity through Ab Initio molecular dynamics*, **Solid State Ionics** 2019, *338*, 177-184.

64. Maosen Fu, Zhenpeng Yao, Xiao Ma, Hui Dong, Ke Sun, Sooyeon Hwang, Enyuan Hu, Hong Gan, **Yan Yao**, Eric A. Stach, Chris Wolverton, and Dong Su*, *Expanded lithiation of titanium disulfide: reaction kinetics of multi-step conversion reaction*, **Nano Energy** 2019, *63*, 103882.

65. Xiaowei Chi, Fang Hao, Jibo Zhang, Xiangwei Wu, Ye Zhang, Zhaoyin Wen*, **Yan Yao***, *A high-energy quinone-based all-solid-state sodium metal battery*, **Nano Energy** 2019, *62*, 718-724.

66. Fang Hao, Xiaowei Chi, Yanliang Liang, Ye Zhang, Rong Xu, Hua Guo, Tanguy Terlier, Hui Dong, Kejie Zhao, Jun Lou, **Yan Yao***, *Taming active material-solid electrolyte interfaces with organic cathode for all-solid-state batteries*, **Joule** 2019, *3*, 1349-1359. Featured in Science news.

67. Pu Hu, Ye Zhang, Xiaowei Chi, Karun Kumar Rao, Fang Hao, Hui Dong, Fangmin Guo, Ren Yang, Lars C. Grawbow, **Yan Yao***, *Stabilizing the interface between sodium metal anode and sulfide solid-state electrolyte with electron blocking interlayer*, **ACS Applied Materials and Interfaces** 2019, *11*, 9672-9678.

68. Yang Chen, Yi Shi, Yanliang Liang, Hui Dong, Fang Hao, Audrey Wang, Yuxiang Zhu, Xiaoli Cui, **Yan Yao***, *Hyperbranched PEO-based hyperstar solid polymer electrolytes with simultaneous improvement of ion transport and mechanical strength*, **ACS Applied Energy Materials** 2019, *2*, 1608-1615.

69. Fangjie Mo, Xiaowei Chi, Sangpu Yang, Feilong Wu, Yun Song, Dalin Sun, **Yan Yao***, Fang Fang*, *Stable three-dimensional metal hydride anodes for solid-state lithium storage*, **Energy Storage Materials** 2019, *18*, 423-428.

70. Xiaomeng Hou, Mi Xu, Changheng Tong, Wenxian Ji, Zhengyang Fu, Zhining Wan, Fang Hao, Yue Ming, Shuang Liu, Hongwei Han, Yaoguang Rong*, **Yan Yao***, *High performance printable perovskite solar cells based on Cs0.1FA0.9PbI3 in mesoporous scaffolds.* **Journal of Power Sources** 2019, *415*, 105-111.

71. Yanliang Liang, **Yan Yao***, *Halfway through*. **Nature Energy** 2019, *4*, 10-11.

72. Hui Dong, Yanliang Liang*, Oscar Tutusaus, Rana Mohtadi, Ye Zhang, Fang Hao, **Yan Yao***, *Directing Mg-storage chemistry in organic polymers towards high-energy Mg batteries*. **Joule** 2019, 3, 782-793. Featured as Journal Front Cover

73. Limin Zhou, Fangyu Xiong, Shuangshuang Tan, Qinyou An*, Zhaoyang Wang, Wei Yang, Zhanliang Tao, **Yan Yao***, Jun Chen, Liqiang Mai*, *Nickel-iron bimetallic diselenides with enhanced kinetics for high-capacity and long-life magnesium batteries*. **Nano Energy** 2018, 54, 360-366.

74. Fang Hao, Fudong Han, Yanliang Liang, Chunsheng Wang, **Yan Yao***, *Architectural design and fabrication approaches for solid-state batteries*. **MRS Bulletin** 2018, 43, 775-781.

75. Yanliang Liang, **Yan Yao***, *Positioning organic electrode materials in the battery landscape*. **Joule** 2018, *2*, 1690-1706.

76. Xiaowei Chi, Yanliang Liang, Fang Hao, Ye Zhang, Justin Whiteley, Hui Dong, Pu Hu, Sehee Lee, **Yan Yao***, *Tailored organic electrode material compatible with sulfide electrolyte for stable all-solid-state sodium batteries*. **Angewandte Chemie Inter. Ed.** 2018, *130*, 2660-2264. Featured as Journal Front Cover

77. Alexandru Vlad, Stefano Passerini, **Yan Yao**, Yang-Kook Sun, *Advanced materials and systems for electrochemical energy storage (EMRS/B 2017): Foreward*. **Electrochimica Acta** 2018, 271, 146-149.

78. Lixin Xie, Ze Yang, Jingying Sun, Haiqing Zhou, Xiaowei Chi, Hailong Chen, Andy X. Li, **Yan Yao**, Shuo Chen*, *Bi2Se3/C nanocomposite as a new sodium-ion battery anode material*. **Nano-Micro Letters** 2018, 10, 50.

79. Yanliang Liang, Yan Jing, Saman Gheytani, Kuan-Yi Lee, Ping Liu, Antonio Facchetti*, **Yan Yao***, *Universal quinone electrodes for long cycle life aqueous rechargeable batteries*. **Nature Materials** 2017, 16, 841-848. Featured in *Nature Energy* 2017, 2, 17149.

80. Hyun Deog Yoo, Yanliang Liang, Hui Dong, Junhao Lin, Hua Wang, Yisheng Liu, Lu Ma, Tianpin Wu, Yifei Li, Qiang Ru, Yan Jing, Qinyou An, Wu Zhou, Jinghua Guo, Jun Lu, Sokrates T. Pantelides, Xiaofeng Qian, **Yan Yao***, *Fast kinetics of magnesium monochloride cations in interlayer-expanded titanium disulfide for magnesium rechargeable batteries*. **Nature Comm.** 2017, *8*: 339. Featured in DOE Office of Science homepage and in 2017 Advanced Photon Source Science Report.

81. Yan Jing, Yanliang Liang, Saman Gheytani, **Yan Yao***, *Cross-conjugated oligomeric quinones for high performance organic batteries*. **Nano Energy** 2017, *37*, 46-52.

82. Saman Gheytani, Yanliang Liang, Feilong Wu, Yan Jing, Hui Dong, Karun K. Rao, Xiaowei Chi, Fang Fang, **Yan Yao***, *An aqueous Ca-ion battery*. **Advanced Science** 2017, 1700465.

83. Rui Guo, Zhuan Zhu, Abdelaziz Boulesbaa, Fang Hao, Kai Xiao, Jiming Bao, **Yan Yao***, Wenzhi Li*, *Synthesis and photoluminescence properties of 2D phenethylammonium lead bromide perovskite nanocrystals*. **Small Methods** 2017, *1*, 1700245.

84. Swaminathan Venkatesan, Mehedhi Hassan, Junyoung Kim, Nader R. Rady, Sandeep Sohal, Eric Neier, **Yan Yao*** and Alexander Zakhidov*, *Tailoring the nucleation and grain growth by precursor phase ratio for efficient organic lead halide perovskite optoelectronic devices*. **Journal of Materials Chemistry C** 2017, *5*, 10114-10121.

85. Jieyu Liu, Meng Yu, Xuewei Wang, Jie Wu, Changhong Wang, Lijun Zheng, Dachi Yang, Hui Liu, **Yan Yao**, Feng Lu*, and Weichao Wang*, *Investigation of high oxygen reduction reaction catalytic prformance on Mn-based Mullite $SmMn_2O_5$*. **J. Mater. Chem. A** 2017, *5*, 20922-20931.

86. Swaminathan Venkatesan, Fang Hao, Junyoung Kim, Rui Guo, Yaoguang Rong, Zhuan Zhu, Wenzhi Li, Jiming Bao, **Yan Yao***, *Moisture-driven phase transition for improved perovskite solar cells with reduced trap-state density*. **Nano Research** 2017, *10*, 1413-1422.

87. Yifei Li, Qinyou An, Yingwen Chen, Yanliang Liang, Yang Ren, Cheng-Jun Sun, Hui Dong, Zhongjia Tang, Guosheng Li*, **Yan Yao***, *A high-voltage rechargeable magnesium-sodium hybrid battery*. **Nano Energy** 2017, *34*, 188-194.

88. Xiaofang Wang, Pu Hu, Lanli Chen, **Yan Yao**, Qingyu Kong, Guanglei Cui*, Siqi Shi*, Liquan Chen, *An a-CrPO4-type $NaV_3(PO_4)_3$ anode for sodium-ion batteries with excellent cycling stability and the exploration of sodium storage behavior*. **J. Mater. Chem. A** 2017, *5*, 3839-3847.

89. **Yan Yao***, *Taming lithium metal through seeded growth*. **National Science Review** 2017, *4*, 17-18.

90. Zhaolin Liu, Pu Hu, Jun Ma, Bingsheng Qin, Zhongyi Zhang, Chunbo Mou, **Yan Yao**, Guanglei Cui*, *Conformal poly(ethyl alpha-cyanoacrylate) nano-coating for improving the interface stability of $LiNi_{0.5}Mn_{1.5}O_4$*, **Electrochimica Acta** 2017, *236,* 221-227.

91. Chao Wang*, Hanqing Tian, Jing Jiang, Ting Zhou, Qing Zeng, Xinrui He, Pei Huang, **Yan Yao**, *Facile synthesis of different morphologies of Cu_2SnS_3 for high-performance supercapacitors.* **ACS Applied Materials & Interfaces** 2017, *9*, 26038-26044.

92. Yingwen Chen, Hee Jung Chang, Hui Dong, Daiwon Choi, Vincent Sprenkle, Jun Liu, **Yan Yao***, Guosheng Li*, *Rechargeable magnesium-lithium hybrid batteries: status and challenges*. **Journal of Materials Research** 2016, *31*, 3125-3141.

93. Zelang Jian, Yanliang Liang, Ismael A. Rodriguez Perez, **Yan Yao***, Xiulei Ji*, *Poly(anthraquinonyl sulfide) cathode for potassium-ion batteries*. **Electrochemistry Comm.** 2016, *71*, 5-8.

94. Zhuan Zhu, Viktor G. Hadjiev, Yaoguang Rong, Rui Guo, Bo Cao, Zhongjia Tang, Fan Qin, Yang Li, Yanan Wang, Fang Hao, Swaminathan Venkatesan, Wenzhi Li, Steven Baldelli, Arnold M. Guly, Hui Fang, Yandi Hu, **Yan Yao**, Zhiming Wang* and Jiming Bao*, *Interaction of organic cation with water molecule in perovskite $MAPbI_3$: from dynamic orientational disorder to hydrogen bonding*. **Chem. Mater.** 2016, *28*, 7385-7393.

95. Yifei Li, Xiaoxue Zhang, Hao-Bo Li, Hyun Deog Yoo, Qinyou An, Jieyue Liu, Meng Yu, Weichao Wang*, **Yan Yao***, *Mixed-phase mullite electrocatalyst for pH-neutral oxygen reduction in magnesium-air batteries*. **Nano Energy** 2016, *27*, 8-16.

96. Hui Dong, Yifei Li, Yanliang Liang, Guosheng Li, Yang Ren, Chenjun Sun, Yuhao Lu*, **Yan Yao***, *A stable high-voltage hybrid magnesium-sodium-ion battery with high operational voltage*. **Chemical Comm.** 2016, *52*, 8263-8266.

97. Jing Shuai, Hyun Deog Yoo, Yanliang Liang, Yifei Li, Yan Yao*, Lars Grabow*, *Density functional study of Li, Na, and Mg intercalation and diffusion in MoS_2 with controlled interlayer spacing*. **Materials Research Express** 2016, *3*, 64001.

98. Hyun Deog Yoo, Yifei Li, Yanliang Liang, Yucheng Lan, Feng Wang, **Yan Yao***, *Intercalation pseudocapacitance of exfoliated molybdenum disulphide for ultrafast energy storage*. **ChemNanoMat** 2016, 2, 688-691. Featured as Journal Front Cover

99. Yifei Li, Dandan Wang, Qinyou An, Bush Ren, Yaoguang Rong, **Yan Yao***, *Flexible cathode for long-life rechargeable sodium-ion batteries: effect of oxygen vacancy in MoO_3*. **Journal of Materials Chemistry A** 2016, *4*, 5402-5405.

100. Yaoguang Rong, Swaminathan Venkatesan, Rui Guo, Yanan Wang, Jiming Bao, Wenzhi Li, Zhiyong Fan, Yan Yao*, *Critical kinetic control of non-stoichiometric intermediate phase transformation for efficient perovskite solar cells*. **Nanoscale** 2016, *8*, 12892-12899. Featured as Journal Front Cover.

101. Dan Sun, Xia Xue, Yougen Tang, Yan Jing, Bin Huang, Yu Ren, Yan Yao, Haiyan Wang*, and Guozhong Cao*, *High rate $LiTi_2(PO_4)_3$@N-C composite via bi-nitrogen sources doping*. **ACS Applied Materials & Interfaces** 2015, *7*, 28337.

102. Qinyou An, Yifei Li, Hyun Deog Yoo, Shuo Chen, Qiang Ru, Liqiang Mai*, **Yan Yao***, *Graphene decorated vanadium oxide nanowire aerogel for long-cycle-life magnesium battery cathodes*. **Nano Energy** 2015, *18*, 265-272.

103. Saman Gheytani, Yanlaing Liang, Yan Jing, Jeff Xu, **Yan Yao***, *Chromate conversion coated aluminium as light-weight and corrosion-resistant current collector for aqueous lithium-ion batteries*. **Journal of Materials Chemistry A** 2015, *4*, 395-399. Featured as Inside Front Cover and 2015 JMCA

Hot Paper

104. Mohammad M. Tavakoli, Leilei Gu, Yuan Gao, Claas Reckmeier, Jin He, Andrey L. Rogach, **Yan Yao**, Zhiyong Fan*, *Fabrication of efficient planar perovskite solar cells using a one-step chemical vapor deposition method*. **Scientific Reports** 2015, *5*, 14083.

105. Mohammad M. Takvakoli, Kwong-Hoi Tsui, Qianpeng Zhang, Jin He, **Yan Yao**, Dongdong Li, Zhiyong Fan*, *Highly efficient flexible pervoskite solar cells with antireflection and self-cleaning nanostructures*. **ACS Nano** 2015, 9, 10287-10295.

106. Dan Sun, Yifan Jiang, Haiyan Wang*, **Yan Yao**, Guoqing Xu, Kejian He, Suqin Liu, Yougen Tang, Younian Liu, Xiaobing Huang, *Advanced aqueous rechargeable lithium battery using nanoparticulate $LiTi_2(PO_4)_3$/C as a superior anode*. **Scientific Reports** 2015, *5*, 10733.

107. Yaoguang Rong, Zhongjia Tang, Yufeng Zhao, Xin Zhong, Swaminathan Venkatesan, Harrison Graham, Matthew Patton, Yan Jing, Arnold M. Guloy*, **Yan Yao***, *Solvent engineering towards controlled grain growth in perovskite planar heterojunction solar cells*. **Nanoscale** 2015, *7,* 10595-10599.

108. Yifei Li, Yanliang Liang, Francisco C. Robles Hernandez, Hyun Deog Yoo, Qinyou An, **Yan Yao***, *Enhancing sodium-ion battery performance with interlayer-expanded MoS_2–PEO nanocomposites*. **Nano Energy** 2015, *15*, 453-461.

109. Jingjing Fan, Yifei Li, Hang N. Nguyen, **Yan Yao***, Debora F. Rodrigues*, *Toxicity of exfoliated-MoS_2 and annealed exfoliated-MoS_2 towards planktonic cells, biofilms, and mammalian cells in the presence of electron donor*. **Environmental Science: Nano** 2015, *2*, 370-379.

110. Yanliang Liang, Zhihua Chen, Yan Jing, Yaoguang Rong, Antonio Facchetti*, **Yan Yao***, *Heavily n-dopable π-conjugated redox polymers with ultrafast energy storage capability*. **Journal of American Chemical Society** 2015, *137*, 4956-4959. Featured as Editors' Choice and JACS spotlight.

111. Hyun Deog Yoo, Yanliang Liang, Yifei Li, **Yan Yao****, *High areal capacity hybrid magnesium−lithium-ion battery with 99.9% Coulombic efficiency for large-scale energy storage*. **ACS Appl. Materials & Interfaces** 2015, *7*, 7001-7007.

112. Yanliang Liang, Hyun Deog Yoo, Yifei Li, Jing Shuai, Hector A. Calderon, Francisco Carlos Robles Hernandez, Lars C. Grabow, **Yan Yao***, *Interlayer-expanded molybdenum disulfide nanocomposites for electrochemical magnesium storage*. **Nano Letters** 2015, *15*, 2194-2202.

113. Qinyou An, Fangyu Xiong, Qiulong Wei, Jinzhi Sheng, Liang He, Dongling Ma, **Yan Yao***, Liqiang Mai*, *Nanoflake-assembled hierarchical $Na_3V_2(PO_4)_3$/C microflowers: superior Li storage performance and insertion/extraction mechanism*. **Advanced Energy Material**s 2015, 1401963.

114. Zelang Jian, Mingbo Zheng, Yanliang Liang, Xiaoxue Zhang, Saman Gheytani, Yucheng Lan, Yi Shi, **Yan Yao***, *Li_3VO_4 Anchored Graphene Nanosheets for Long-Life and High-Rate Lithium-Ion Batteries*. **Chemical Comm.** 2015, *51*, 229-231.

115. Zelang Jian, Wenze Han, Yanliang Liang, Yucheng Lan, Zheng Fang, Yongsheng Hu, **Yan Yao***, *Carbon-Coated Rhombohedral $Li_3V_2(PO4)_3$ as Novel Electrode Materials for Lithium-Ion Batteries: Electrochemical Performance and Storage Mechanism*. **Journal of Material Chemistry A** 2014, *2*, 20231-20236.

116. Jiabo Zeng, Fusheng Zhao, Ji Qi, Yifei Li, Chien-Hung Li, **Yan Yao,** T. Randall Lee, and Wei-Chuan Shih*, *Internal and external morphology-dependent plasmonic resonance in monolithic nanoporous gold nanoparticles*. **RSC Advances** 2014, *4*, 36682-36688.

117. Qingfeng Lin, Hongtao Huang, Yan Jing, Huiying Fu, Paichun Chang, Dongdong Li*, **Yan Yao***, Zhiyong Fan*, *Flexible photovoltaic technologies*. **Journal of Materials Chemistry C** 2014, *2*, 1233-1247.

118. Shaofeng Lu, Martin Drees, **Yan Yao**, Damien Boudinet, He Yan, Hualong Pan, Jingqi Wang, Yuning Li, Hakan Usta, and Antonio Facchetti*, *3,6-Dithiophen-2-yl-diketopyrrolo[3,2-b]pyrrole (isoDPPT) as an acceptor building block for organic optoelectronics*. **Macromolecules** 2013, *46*, 3895–3906.

119. Dong Liang; Yijie Hui, Yangsen Kang, Ken Xingze Wang, Angjia Gu, Meiyueh Tan, Zongfu Yu, Shuang Li,, Jieyang Jia, Xinyu Bao , Shuang Wang, **Yan Yao**, H.-S. Philip Wong, Shanhui Fan, Yi Cui*, and James S. Harris, *Optical absorption enhancement: optical absorption enhancement in freestanding GaAs thin film nanopyramid arrays*. **Advanced Energy Materials** 2012, *2*, 1154-1260.

120. **Yan Yao**, Jie Yao,Vijay Kris Narasimhan, Zhichao Ruan, Chong Xie, Shanhui Fan, Yi Cui*, *Broadband light management using low-Q whispering gallery modes in spherical nanoshells.* **Nature Comm.** 2012, *4*, 664. Featured in *Nature* 2012, *482*, 278.

121. **Yan Yao**, Nian Liu, Matthew T. McDowell, Mauro Pasta, and Yi Cui*, *Improving the cycling stability of silicon nanowire anodes with conducting polymer coatings*. **Energy & Environmental Science** 2012, *5*, 7927–7930.

122. **Yan Yao**, Matthew T. McDowell, Ill Ryu, Hui Wu, Nian Liu, Liangbing Hu, William D. Nix, Yi Cui*, *Interconnected silicon hollow nanospheres for lithium-ion battery anodes with long cycle life*. **Nano Letters** 2011, *11*, 2949–54.

123. **Yan Yao**, Kaifu Huo, Liangbing Hu, Nian Liu, Judy J. Cha, Matthew T. McDowell, Paul K. Chu, Yi Cui*, *Highly conductive, mechanically robust, and electrochemically inactive TiC/C nanofiber scaffold for high-performance silicon anode batteries*. **ACS Nano** 2011, *5*, 8346–8351.

124. Hui Wu, Gerentt Chan, Jang Wook Choi, Ill Ryu, **Yan Yao**, Matthew T.McDowell, Lee, Seok Woo Lee, Ariel Jackson, Yuan Yang, Liangbing Hu, Yi Cui*, *Stable cycling of double-walled silicon nanotube battery anodes through solid-electrolyte interphase control*. **Nature Nanotechnology** 2012, *7*, 310–315.

125. Nian Liu, **Yan Yao**, Judy J. Cha, Matthew T. McDowell, Yu Han, and Yi Cui*, *Functionalization of silicon nanowire surfaces with metal-organic frameworks*. **Nano Research** 2012, *5*, 109–116.

126. Nian Liu, Hui Wu, Matthew T. McDowell, **Yan Yao**, Chongmin Wang, Yi Cui*, *A Yolk-shell design for stabilized and scalable Li-Ion battery alloy anodes*. **Nano Letters** 2012, *12*, 3315–3321.

127. Nam-Soon Choi, **Yan Yao**, Yi Cui*, Jaephil Cho*, *One dimensional Si/Sn-based nanowires and nanotubes for lithium-ion energy storage materials*. **Journal of Materials Chemistry** 2011, *21*, 9825.

128. Yuan Yang, Guihua Yu, Judy J. Cha, Hui Wu, Michael Vosgueritchian, **Yan Yao**, Zhenan Bao*, Yi Cui*, *Improving the performance of lithium-sulfur batteries by conductive polymer coating*. **ACS Nano** 2011, *5*, 9187–9193.

129. Hui Wu, Liangbing Hu, Thomas Carny, Zhichao Ruan, Desheng Kong, Zongfu Yu, **Yan Yao**, Judy J. Cha, Jia Zhu, Shanhui Fan, Yi Cui*, *Low reflectivity and high flexibility of tin-doped indium oxide nanofiber transparent electrodes*. **Journal of the American Chemical Society** 2011, *133*, 27-29.

130. Liangbing Hu, Wei Chen, Xing Xie, Nian Liu, Yuan Yang, Hui Wu, **Yan Yao**, Mauro Pasta, Husam N. Alshareef, and Yi Cui*, *Symmetrical MnO_2-carbon nanotube-textile nanostructures for wearable pseudocapacitors with high mass loading*. **ACS Nano** 2011, *5*, 8904–8913.

131. Diego Bagnis, Luca Beverina, Hui Huang, Fabio Silvestri, **Yan Yao**, He Yan, Giorgio A. Pagani*, Tobin J. Marks*, Antonio Facchetti*, *Marked alkyl-vsalkenyl-substitutent effects on squaraine dye solid-state structure, carrier mobility, and bulk-heterojunction solar cell efficiency*. **Journal of the American Chemical Society** 2010, *132*, 4074–4075.

132. Leila Motiei, **Yan Yao**, Joyanta Choudhury He Yan, Tobin J. Marks*, Milko E. van der Boom*, Antonio Facchetti*, *Self-propagating molecular assemblies as interlayers for efficient inverted bulk-heterojunction solar cells*. **Journal of the American Chemical Society** 2010, *132*, 12528–12530.

133. **Yan Yao**, Jianhui Hou, Zheng Xu, Gang Li, Yang Yang*, Effects of solvent mixtures on the nanoscale phase separation in polymer solar cells. **Advanced Functional Materials** 2008, *18*, 1783–1789.

134. **Yan Yao**, Hsiang-Yu Chen, Jinsong Huang, Yang Yang*, *Low voltage and fast speed all-polymer optocouplers*. **Applied Physics Letters** 2007, *90*, 053509.

135. **Yan Yao**, Yongye Liang, Vishal Shrotriya, Shengqiang Xiao, Luping Yu*, Yang Yang*, *Plastic near-infrared photodetectors utilizing a low band gap polymer*. **Adv. Mater.** 2007, *19*, 3979–3983.

136. **Yan Yao**, Chenjun Shi, Gang Li, Vishal Shrotriya, Qibing Pei, Yang Yang*, *Effects of C_{70} derivative in low band gap polymer photovoltaic devices: Spectral complementation and morphology optimization*. **Applied Physics Letters** 2006, *89*, 153507.

137. Gang Li, **Yan Yao**, Hoichang Yang, Vishal Shrotriya, Guanwen Yang, Yang Yang*, *"Solvent annealing" effect in polymer solar cells based on poly(3-hexylthiophene) and methanofullerenes.* **Advanced Functional Materials** 2007, *17*, 1636–1644.

138. Jianhui Hou, Mi-Hyae Park, Shaoqing Zhang, **Yan Yao**, Li-Min Chen, Juo-Hao Li, and Yang Yang*, *Bandgap and molecular energy level control of conjugated polymer photovoltaic materials based on benzo[1,2- b :4,5- b ']dithiophene*. **Macromolecules** 2008, *41*, 6012–6018.

139. Bao Lei, **Yan Yao**, Ankit Kumar, Yang Yang*, Vidvuds Ozolins*, *Quantifying the relation between the morphology and performance of polymer solar cells using Monte Carlo simulations*. **Journal of Applied Physics** 2008, *104*, 024504.

140. Sista Srinivas, **Yan Yao**, Yang Yang*, Ming Lee Tang, Zhenan Bao, Enhancement in open circuit voltage through a cascade-type energy band structure. **Applied Physics Letters** 2007, *91*, 223508.

141. Gang Li, Vishal Shrotriya, **Yan Yao**, Jinsong Huang, Yang Yang*, *Manipulating regioregularpoly(3-hexylthiophene) : [6,6]-phenyl-C61-butyric acid methyl ester blends—route towards high efficiency polymer solar cells*. **Journal of Materials Chemistry** 2007, *17*, 3126.

142. Chenjun Shi, **Yan Yao**, Yang Yang, Qibing Pei*, *Regioregular copolymers of 3-alkoxythiophene and their photovoltaic application*. **Journal of the American Chemical Society** 2006, *128*, 8980–6.

143. Vishal Shrotriya, Gang Li, **Yan Yao**, Tom Moriarty, Keith Emery*, Yang Yang*, *Accurate measurement and characterization of organic solar cells*. **Advanced Functional Materials** 2006, *16*, 2016–2023.

144. Vishal Shrotriya, Gang Li, **Yan Yao**, Chih-Wei Chu, Yang Yang*, *Transition metal oxides as the buffer layer for polymer photovoltaic cells*. **Applied Physics Letters** 2006, *88*, 073508.

145. Vishal Shrotriya, Elbert Hsing-En Wu, Gang Li, **Yan Yao**, Yang Yang*, Efficient light harvesting in multiple-device stacked structure for polymer solar cells. **Applied Physics Letters** 2006, *88*, 064104.

146. Vishal Shrotriya, **Yan Yao**, Gang Li, Yang Yang*, *Effect of self-organization in polymer/fullerene bulk heterojunctions on solar cell performance*. **Applied Physics Letters** 2006, *89*, 063505.

147. Gang Li, Vishal Shrotriya, Jinsong Huang, **Yan Yao**, Tom Moriarty, Keith Emery, Yang Yang*, *High-efficiency solution processable polymer photovoltaic cells by self-organization of polymer blends*. **Nature Materials** 2005, *4*, 864–868.

148. Gang Li, Vishal Shrotriya, **Yan Yao**, Yang Yang*, *Investigation of annealing effects and film thickness dependence of polymer solar cells based on poly(3-hexylthiophene).* **Journal of Applied Physics** 2005, *98*, 043704.

149. Zhiyong Fan, Xiaoliang Mo, Chengfei Lou, **Yan Yao**, Dawei Wang, Guorong Chen, and Jia G. Lu*, *Structures and electrical properties of Ag-tetracyanoquinodimethane organometallic nanowires*. **IEEE Transactions on Nanotechnology** 2005, *4*, 238–241.

150. Chunnuan Ye, Zhiyong Fan, Jian Yang, **Yan Yao**, Xiaoliang Mo, Huahua Xu, Chengfei Lou, Guanying Cao, Jia Lu, Guorong Chen, *Growth mechanism of Ag(TCNQ) nanocrystal whiskers*, **Vacuum Science and Technology** 2004, 24, 129-132.

151. Xiaoliang Mo, **Yan Yao**, Zhiyong Fan, Huahua Yu, Jian Yang, Guorong Chen, *Research of coulomb island induced by STM in PAR thin film*. **Journal of Functional Materials** 2003, 34, 412-413.

152. Xiaoliang Mo, Guorong Chen*, Qinjia Cai, Zhiyong Fan, Huahua Xu, **Yan Yao**, Jian Yang, Haihua Gu, Zhongyi Hua*, *Preparation and electrical/optical bistable property of potassium tetracyanoquinodimethane thin films*. **Thin Solid Films** 2003, 436, 259-263.

153. Zhiyong Fan, Guorong Chen, Xiaoliang Mo, **Yan Yao**, Jian Yang, Qingjia Cai, Haihua Gu, Zhongyi Hu*, *Electric properties of nanoscale Ag(TCNQ) films*. **Vacuum Science and Tech.** 2002, 22, 5-7.

154. Qingjia Cai, Guorong Ghen, Xiaoliang Mo, Zhiyong Fan, Haihua Gu, **Yan Yao**, Jian Yang, Zhongyi Hua, Huahua Xu*, Preparation and electrical bistable property of K(TCNQ) thin film, **Vacuum Science and Tech.** 2001, 21, 364-367.

(c) Conference Proceedings

155. Mai Le, Hieu Le, Lihong Zhao, Xuqing Wu, Jiefu Chen, and **Yan Yao**, *Predicting Ionic Conductivity of Solid-State Battery Cathodes Using Machine Learning*. 2024 USNC-URSI National Radio Science Meeting, 2024.

156. Chaoshan Wu, Lihong Zhao, Qing Ai, Samprash Risal, Jun Lou, **Yan Yao**, Zheng Fan, *In situ observation of lithium stripping and plating process in an open-cell all-solid-state lithium metal battery*, **Microscopy and Microanalysis**, 2023, 29, 1287-1288. DOI: https://doi.org/10.1093/micmic/ozad067.658.

157. Cunzhi Zhao, Xingpeng Li, **Yan Yao**, *Quality analysis of battery degradation models with real battery aging experimental data*, **2023 IEEE Texas Power and Energy Conference (TPEC)**, 2023, DOI: 10.1109/TPEC56611.2023.10078599.

158. Akshay Kakar, Fang Hao, Yanliang Liang, **Yan Yao***, Zheng Fan*, *In situ observations of interfacial evolutions in solid-state lithium battery with sulfide-based solid electrolyte*, **IEEE NANO 19th International Conference on Nanotechnology**, 2020, DOI: 10.1109/NANO46743.2019.8993686.

159. Chaoxian Qi, David R. Jackson, **Yan Yao**, Jiefu Chen*, *SIW Microstrip Cavity Resonators with a Sensing Aperture,* **IEEE Texas Symposium on Wireless and Microwave Circuits and Systems** (WMCS), 2019, DOI: 10.1109/WMCaS.2019.8732530

160. Xiaowei Chi, Yanliang Liang, **Yan Yao***, *Electrolyte dictated materials design for beyond lithium ion batteries*. **Proc. SPIE 10663, Energy Harvesting and Storage: Materials, Devices, and Applications VIII,** 2018, 106630H, DOI: 10.1117/12.2304565.

161. Dongjuan Xi, Chenjun Shi, **Yan Yao**, Yang Yang*, *Nanostructured polymer solar cells*. **IEEE Internatinal Reliability Physics Symposium,** 2008, 178-180, DOI: 10.1109/RELPHY.2008.4558881

162. **Yan Yao**, Chenjun Shi, Qibing Pei, Yang Yang*, *Effect of side-chains on low band gap polymer photovoltaic devices*. ***Proc. SPIE*** **Organic Photovoltaics VII**, 2006, *6334*, 633415.

163. Vishal Shrotriya, Gang Li, **Yan Yao**, Yang Yang*, *Tandem stacking structure for polymer solar cells by using semi-transparent electrodes*. **Proc. SPIE Organic Photovoltaics VII**, 2006, *6334*, 633416.

164. Zhiyong Fan, Dawei Wang, Jia G. Lu, Xiaoliang Mo, **Yan Yao**, Guorong Chen*, Silver-tetracyanoquinodimethane (Ag-TCNQ) nanostructures and nanodevice. *IEEE NANO* **2003**, *2*, 588-591.

(d) Edited Books Chapters

165. Hui Dong, **Yan Yao***, *Development of cathode materials for rechargeable magnesium batteries: from intercalation to enolization*, **Encyclopedia of Nanomaterials**, 2022, doi:10.1016/B978-0-12-822425-0.00087-7.

166. Gang Li, Vishal Shrotriya, Jinsong Huang, **Yan Yao**, Tom Moriarty, Keith Emery, Yang Yang*, *High-efficiency solution processable polymer photovoltaic cells by self-organization of polymer blends*, **Book Chapter in Materials for Sustainable Energy**, World Scientific, 2010, 80-84. Edited by Vincent Dusastre.

167. Yang Yang*, **Yan Yao**, Gang Li, *Routes toward high-efficiency polymer solar cells*, **Chapter 11 in Organic Electronics: Materials, Physics, Processing and Device Applications**, CRC Press, Boca Raton, Florida, 2009, 319-358. Edited by Franky So.

(e) Patents and Patent Applications

Issued Patents (Total 12)

1. High ionic conductivity rechargeable solid state batteries with an organic electrode
   US Patent 11,621,420
   Inventors: **Yan Yao**, Yanliang Liang

2. Rechargeable alkaline battery using organic materials as negative electrodes
   US Patent 10,749,180
   Inventors: **Yan Yao**, Yanliang Liang

3. Lead-acid batteries with fast charge acceptance
   US Patent 10,522,875
   Inventors: **Yan Yao**, Yanliang Liang, Saman Gheytani, Yan Jing

4. Aqueous energy storage devices with organic electrode materials
   US Patent 10,411,262
   Inventors: **Yan Yao**, Yanliang Liang

5. Rechargeable alkaline battery using organic materials as negative electrodes
   US Patent 10,033,039
   Inventors: **Yan Yao**, Yanliang Liang

6. Non-lithium metal ion battery electrode materials architecture
   US Patent 9,745,205
   Inventors: **Yan Yao**, Yanliang Liang

7. Non-lithium metal ion battery electrode materials architecture
   US Patent 9,725,331
   Inventors: **Yan Yao**, Yanliang Liang

8. Conjugated polymers and their use in optoelectronic devices
   US Patent 8,748,739
   Inventors: Zhengguo Zhu, Martin Drees, Hualong Pan, **Yan Yao**, He Yan, Shaofeng Lu, Antonio Facchetti

9. Conjugated polymers and their use in optoelectronic devices
   US Patent 8,598,449
   Inventors: Hualong Pan, He Yan, **Yan Yao**, Shaofeng Lu, Zhengguo Zhu, Antonio Facchetti

10. Conjugated polymers and their use in optoelectronic devices
US Patent 8,598,448
Inventors: Shaofeng Lu, Antonio Facchetti, **Yan Yao**, Martin Drees, He Yan

11. Pyrrolo[3,2-b]pyrrole semiconducting compounds and devices incorporating same
US Patent 8,598,450
Inventors: Hualong Pan, Martin Drees, Zhengguo Zhu, **Yan Yao**, Shaofeng Lu, Antonio Facchetti

12. Conjugated polymers and their use in optoelectronic devices
US Patent 8,334,456
Inventors: Zhengguo Zhu, Martin Dress, Hualong Pan, **Yan Yao**, He Yan, Shaofeng Lu, Antonio Facchetti

Patent Applications (Total 9)

13. **Yan Yao**, Xiaowei Chi, Solid electrolyte for sodium batteries, US Application 2021/0066748 A1.

14. **Yan Yao**, Hyun Deog Yoo, Method of activating two-dimensional materials for multivalent/polyatomic-ion intercalation battery electrodes, US Application 2018/0183038 A1.

15. **Yan Yao**, Hyun Deog Yoo, Method of activating two-dimensional materials for multivalent/polyatomic-ion intercalation battery electrodes, US Application 2021/0210742 A1.

16. Zheng Fan, **Yan Yao**, Air-free transfer vessel for multiple diagnostic tools, US Application, 18/341,051, 6/26/2023.

17. Ognjen Miljanic, **Yan Yao**, Said Jalife Jacobo, Judy Wu, Alexandra Robles, Cyclotetrabenzil material for lithium intercalation and use in organic batteries, US Application 18/216,410, 6/29/2023, UH 2023-051.

18. **Yan Yao**, Benjamin Emley, Chaoshan Wu, Zheng Fan, Lihong Zhao, All-solid-state lithium secondary battery and method of preparing the same, US Application 63/533,518, 8/18/2023, UH 2023-066.

19. **Yan Yao**, Lihong Zhao, Liqun Guo, All-solid-state lithium secondary battery and method of preparing the same, US Application 63/546,985, 11/2/2023, UH 2024-006.

20. Gangbing Song, Thomas Hannan, Jian Chen, **Yan Yao**, Monitoring batteries using low-frequency stress-waves, US Application 63/556,630, 2/22/2024, UH 2024-022.

21. **Yan Yao**, Alae Eddine Lakryachi, Yanliang Liang, Organic cathode materials for magnesium batteries, US Application 63/551,295, 2/8/2024, UH 2024-030.

22. **Yan Yao**, Zhaoyang Chen, Alae Eddine Lakryachi, Alkali-metal-ion conducting organic redox materials and rechargeable solid-state batteries made thereof, US Application 63/659,654, 6/13/2024, UH 2024-070.

Presentations

(a) Plenary/Keynote Presentations

1. (Keynote) “Addressing the Key Challenge of All-Solid-state Batteries with Organic Electrode Materials”, Organic Battery Days 2024, Suwon, South Korea, 6/19-21/2024.

2. (Keynote) “Unveiling Lithium-Solid Electrolyte Interface Evolution in All-Solid-State Batteries through Operando Characterizations”, Biannual International Conference on Energy Storage, Monterrey, Mexico, 11/16-17/2023.

3. (Plenary) “Organic Electrode Materials for Multivalent and Solid-state Batteries”, Organic Battery Days 2023, Donostia-San Sebastian, Spain, 6/8/2023.
4. (Plenary) “Redox active polymers for beyond Li-ion batteries”, International Conference on Functional Polymer Synthesis and Application, International Conference on Functional Polymer Synthesis and Application, Online, 12/9/2021.
5. (Keynote) “Organic electrode material design for beyond lithium ion batteries”, 8th International Conference on Nanoscience & Technology (ChinaNANO 2019), Topical Session on Energy Nanotechnology, Beijing, China, 8/17-19/2019.
6. (Keynote) “Universal quinone electrode for long cycle life energy storage”, Special Symposium in Honor of Michael Armand, ECS Fall Meeting, Cancun, Mexico, 10/2/2018.
7. (Keynote) “Versatile quinones for long cycle life aqueous batteries”, First International Conference on Energy Storage Materials, Shenzhen, China, 11/19-21/2017

(b) Invited Presentations at U.S. and International Conferences

8. (Invited) “Design All-Solid Sodium Batteries under Low Stack Pressure”, 9th International Conference on Sodium Batteries (ICNaB-2024), Pacific Northwest National Laboratory, WA, 11/11-14/2024 (programmed).
9. (Invited) “Innovations of Materials and Characterization for All-Solid-State Batteries”, ACS Fall Meeting Energy Summit, Denver, CO, 8/18-22/2024.
10. (Invited) “Design Organic Electrode Materials for All-Solid-State Batteries”, Beyond Lithium Ion XIV Symposium, Knoxville, TN, 7/23-25/2024.
11. (Invited) “Unveiling Lithium-Solid Electrolyte Interface Evolution in All-Solid-State Batteries through Operando Characterizations”, MRS Spring Meeting, Seattle, WA, 4/22/2024.
12. (Invited) “Organic electrode materials for multivalent and solid-state batteries”, Batteries Gordon Research Conference, Ventura, CA, 2/25-3/1/2024.
13. (Invited) “Ambient temperature all-solid sodium-sulfur batteries”, NAATBatt Sodium-Zinc Battery Workshop, Houston, TX, 11/30/2023.
14. (Invited) “Beyond Li-ion battery chemistries based on organic electrode materials”, The 13th Annual Battery Safety Summit, Tysons, VA, 11/6/2023.
15. (Invited) “Organic electrode materials for magnesium and solid-state batteries”, 2nd Annual Texas Pore Engineering Conference, Denton, TX, 10/21/2023.
16. (Invited) “Visualizing the evolution of lithium-solid electrolyte interface through operando characterizations in all-solid-state batteries”, LLNL Workshop on Electrochemical Interfaces: Integration Between Multiscale Modeling and Multimodal Characterization, Livermore, CA, 9/29/2023.
17. (Invited) “Analytical characterization for solid-state lithium batteries”, Clean Energy Forum 2023, San Diego, CA, 9/26/2023.
18. “Analysis of binder effects in dry and wet processed composite cathodes for all-solid-state lithium batteries”, Dry Coating Forum: shaping the future of dry battery electrode processing, Dresden, Germany, 9/13/2023.
19. “Understanding the role of mixed ionic-electronic conductor interlayer in all-solid-state lithium-metal batteries”, 74th Annual Meeting of the International Society of Electrochemistry, Lyon, France, 9/7/2023.
20. (Invited) “Understanding solid state electrolyte−lithium interfaces via operando characterizations”,

FY23 Solid State Engineering Lab Review Meeting, Berkeley, CA, 8/30/2023.

21. (Invited) "Understanding the role of mixed ionic-electronic conductor interlayer in all-solid-state lithium-metal batteries", Materials Challenges in Alternatives & Renewable Energy 2023 Meeting (MCARE 2023), Seattle, WA, 8/22/2023.
22. (Invited) "Understanding the role of mixed ionic-electronic conductor interlayer in all-solid-state lithium-metal batteries", 243rd ECS Meeting, Boston, MA, 5/28/2023.
23. (Invited) "Lithium- and transition metal-free fast-charging batteries", ARPA-E EVs4All Kick-off Meeting, Alexandria, VA, 5/9/2023.
24. (Invited) "Multidimensional characterizations for all-solid-state batteries", MRS Fall Meeting, Boston, MA, 11/28/2022.
25. (Invited) "Lithium- and transition metal-free fast-charging batteries", MRS Fall Meeting, Boston, MA, 11/28/2022.
26. (Invited) "Redox-active polymers for energy storage", ACS Fall 2022 Meeting, Chicago, IL, 8/23/2022.
27. (Invited) "Understanding solid electrolyte-lithium interfaces via operando characterizations", ACS Fall 2022 Meeting, Chicago, IL, 8/22/2022.
28. (Invited) "Rational design of high-power Mg batteries: from intercalation to conversion chemistry", ACS Fall 2022 Meeting, Chicago, IL, 8/21/2022.
29. (Invited) "Multidimensional characterizations for all-solid-state batteries", 2022 Molecular Foundry User Meeting, Berkeley, CA, 8/19/2022.
30. (Invited) "Understanding Solid Electrolyte-lithium Interfaces via Multiscale Characterizations", Pittcon 2022, Online, 6/9/2022.
31. (Invited) "Advanced Characterizations of Interfaces in Solid-State Batteries", 241st ECS Meeting, Vancouver, BC, Canada, 5/29-6/2/2022.
32. (Invited) "Understanding solid electrolyte-lithium interfaces via operando multiscale characterizations", 2022 MRS Spring Meeting, Honolulu, HI, 5/8-11/2022.
33. (Invited) "Next-generation batteries for electric transportation and stationary energy storage", IEEE NMDC 2021, Online, 12/12-15/2021.
34. (Invited) "Multidimensional diagnostics of solid-state lithium batteries", 2021 MRS Fall Meeting, Boston, MA, 12/2/2021.
35. (Invited) "Rational design of multivalent metal batteries: enolization cathode and nonporous separator", 2021 MRS Fall Meeting, Boston, MA, 11/30/2021.
36. (Invited) "Cobalt-free all-solid-state lithium batteries and air-free vessels for operando diagnosis", Organic Battery Days 2021, Online, 11/25-28/2021.
37. (Invited) "Impact of electrolytes on cathode reaction mechanism in Mg batteries: from intercalation to enolization chemistry", Mg Batteries and Key Materials Workshop, Online, 10/29-30/2021.
38. (Invited) "Cobalt-free all-solid-state lithium batteries and air-free vessels for operando diagnosis", Nano Korea 2021, Online, 7/7-9/2021.
39. (Invited) "Multidimensional diagnostics of the interface evolutions in solid-state lithium batteries", VTO Annual Merit Review, Online, 6/24/2021.
40. (Invited) "High-energy solid-state lithium batteries with organic cathode materials", VTO Annual Merit Review, Online, 6/24/2021.

41. (Invited) “Rational design of high-power Mg batteries: from intercalation to enolization Chemistry”, Beyond Lithium-ion XIII Conference, Online, 6/9-11/2021.

42. (Invited) “Quinone-based organic materials for all-solid-state lithium batteries”, IUPAC-MACRO Conference, Online, 5/19/2021.

43. (Invited) “High-energy all-solid-state organic-lithium batteries”, 2021 Virtual MRS Spring Meeting, Online, 4/22/2021.

44. (Invited) “Beyond Li-ion battery chemistries based on organic electrode materials”, International Battery Seminar, Online, 3/9/2021.

45. (Invited) “High-energy all-solid-state organic-lithium batteries”, 2020 Virtual MRS Spring/Fall Meeting, Online, 12/1/2020.

46. (Invited) “Charge storage mechanism of a quinone polymer electrode for aqueous zinc-ion batteries”, 2020 Virtual MRS Spring/Fall Meeting, Online, 12/1/2020.

47. (Invited) NSF CBET Energy Storage Workshop, Austin, TX, 8/13/2020

48. (Invited) “Potential alternatives of lithium-ion batteries for the motive application”, NATTBATT 2020, Pasadena, CA, 2/13/2020.

49. (Invited) “Electrolyte dictated organic electrode materials design for energy storage”, MRS Fall Meeting, Boston, MA, 12/4/2019.

50. (Invited) “Electrolyte dictated organic electrode materials design for beyond lithium ion batteries”, ACS Meeting, San Diego, CA, 8/27/2019.

51. (Invited) “Developing all-solid-state batteries with organic electrode materials”, 5th International Conference on Energy Conversion and Storage (5th ICECS), Beijing, China, 8/15-16/2019.

52. (Invited) “Electrolyte dictated organic electrode materials design for beyond lithium ion batteries”, 10th International Conference on Materials for Advanced Technologies (ICMAT 2019), Singapore, 6/23-29/2019

53. (Invited) “Taming electrode-electrolyte interfaces using organic electrode materials in all -solid-state batteries”, International Conference on Solid State Ionics (SSI-22), PyeongChang, Korea 6/16-21/2019.

54. (Invited) “Directing Mg-Storage Chemistry in Organic Polymers Toward High-Energy Mg Batteries”, ECS Meeting, Dallas, TX, 5/26-31/2019.

55. (Invited) “Long Cycle Life All-Solid-State Batteries using Organic Electrode Materials”, Nature Conference on Emergent Materials and Devices: Electronic Structures and Properties, Chengdu, China, 4/12-14/2019.

56. (Invited) “Electrolyte dictated organic electrode materials design for beyond lithium ion batteries”, International Coalition for Energy Storage and Innovation and Pacific Power Source and Pacific Power Sources Symposium Joint Meeting, Hawaii, 1/5-10/2019.

57. (Invited) “Versatile redox-active organic molecules for long cycle life safe batteries”, MRS Fall Meeting, Boston, MA, 11/28/2018.

58. (Invited) “Positioning organic electrode materials in the battery landscape”, 2018 International Photonics and Optoelectronics Meetings, Wuhan, China, 11/3/2018.

59. (Invited) “Versatile redox-active organic molecules for long cycle life safe batteries”, *Symposium on Electrochemical Storage Materials and Devices*, AIChE Annual Conference, Pittsburgh, PA, 10/28/2018.

60. (Invited) “Progress of safe lithium ion batteries for electric vehicles”, 2018 CAPA Petroleum Technical

Symposium, Houston, TX, 10/19/2018.

61. (Invited) "Redox-active organic electrode materials for safe energy storage", Symposium *L05 Electroactive and Redox Active Polymers 2,* ECS Meeting, Cancun, Mexico, 10/2/2018.
62. (Invited) "High-energy solid-state lithium batteries with organic cathode materials", DOE Battery500 Review Meeting, San Francisco, CA, 8/1/2018.
63. (Invited) "Electrolyte Dictated Organic Redox Materials Design for Beyond Li Ion Batteries", Chinese Chemical Society Meeting, Hangzhou, China, 5/7/2018.
64. (Invited) "Electrolyte dictated materials design in beyond lithium-ion batteries", *Symposium on Energy Harvesting and Storage: Materials, Devices, and Applications VIII*, SPIE Defense and Commercial Sensing Conference, Orlando, FL, 4/16/2018
65. (Invited) "Universal aqueous energy storage with organic electrodes", *Symposium EN14 Materials Science and Device Engineering for Safe and Long-Life Electrochemical Energy Storage*, MRS Spring Meeting, Phoenix, AZ, 4/2/2018.
66. (Invited) "Versatile quinones for long cycle life aqueous batteries", First Annual Meeting of the International Coalition for Energy Storage and Innovation (ICESI), Dalian, China, 1/17-19/2018.
67. (Invited) "Versatile quinones for long cycle life aqueous batteries", Nature Conference on Materials Electrochemistry: Fundamentals & Applications, Shenzhen, China, 1/13-15/2018.
68. (Invited) "Versatile quinones for long cycle life aqueous batteries", 5th Advanced Batteries for xEV/ESS Conference, Shantou, Guangdong, China, 11/23-25/2017
69. (Invited) "Development of two-dimensional materials and quinones for rechargeable magnesium batteries", Beyond Lithium Ion-X Symposium on Energy Storage, IBM, Almaden, CA 6/27-29/2017
70. (Invited) "Design quinone electrodes for proton and metal ion storage with long cycle life", 3rd International Symposium on Energy Conversion and Storage, Nanjing University, Nanjing, China 6/24-25/2017
71. (Invited) "Design quinone electrodes for proton and metal ion storage with long cycle life", Organic Battery Days, Uppsala, Sweden 6/8-10/2017
72. (Invited) "Transforming two-dimensional materials for high capacity rechargeable magnesium batteries", *Symposium H03 Properties and Applications of 2-Dimensional Layered Materials*, ECS Meeting, New Orleans, LA 5/2017
73. (Invited) "High Performance Magnesium Rechargeable Batteries", *Symposium ES3 Materials for Multivalent Electrochemical Energy Storage*, MRS Spring Meeting, Phoenix, AZ 4/17-21/2017
74. (Invited) "Organic Redox Materials for Stationary Energy Storage", *Symposium BM7 Functional Nanostructured Polymers for Emerging Energy Technologies*, MRS Fall Meeting, Boston, MA, 12/2016
75. (Invited) "A High Performance Magnesium Rechargeable Battery Enabled by a MgCl-ion Storage Mechanism", *Symposium ES1 Materials Science and Chemistry for Grid-Scale Energy Storage*, MRS Fall Meeting, Boston, 12/2016
76. (Invited) "Transforming two-dimensional materials for high capacity rechargeable magnesium batteries", *Organic Inorganic Hybrid Materials*, 2016 ACS Southwest Regional Meeting, Galveston, TX 11/2016
77. (Invited) "Redox-active organic materials for sustainable energy storage", *Colloidal & Surface Phenomena*, 2016 ACS Southwest Regional Meeting, Galveston, TX 11/2016
78. (Invited) "Research progress of rechargeable magnesium batteries", 11th International Forum on Li

battery technology and industrial development, Hefei, Anhui, 10/2016

79. (Invited) "Designing Two-Dimensional Materials and Conjugated Redox Polymers for Safe and Low-Cost Energy Storage" Energy & Sustainable Materials Symposium at the University of Oregon, 9/2016
80. (Invited) "Critical kinetic control of non-stoichiometric intermediate phase transformation for efficient perovskite solar cells", Symposium B7 *Solar Fuels/Artificial Photosynthesis: Materials and Devices*, XXV International Materials Research Congress, Cancun, Mexico, 8/14-19/2016
81. (Invited) "Rational Nanostructured Cathode Design for Rechargeable Magnesium Batteries", *Symposium B3 Materials and Technologies for Energy Conversion, Saving and Storage (MATECSS),* XXV International Materials Research Congress, Cancun, Mexico, 8/14-19/2016
82. (Invited) "Designing Two-Dimensional Materials and Conjugated Redox Polymers for Safe and Low-Cost Energy Storage", Chinese Chemical Society Annual Conference, Dalian, China, 7/1-4/2016.
83. (Invited) "Organic Redox Materials for Stationary Energy Storage", International Conference of Synthetic Metal 2016, Guangzhou, China, 6/26-30/2016
84. (Invited) "Organic Redox Materials for Stationary Energy Storage", 11th US-China Nano Forum, Nanjing, China, 6/18-20/2016
85. (Invited) "Transforming Two-dimensional Transition Metal Chalcogenides for High Capacity Rechargeable Magnesium Batteries", Nature Conference on Materials for Energy 2016, Wuhan, China, 6/11-14/2016
86. (Invited Panelist) 2016 US China Innovation and Investment Summit, Houston, TX, 5/17/2016.
87. (Invited) "Heavily n-Dopable π-Conjugated Redox Polymers for Ultrafast Energy Storage", Symposium *ACS Award for Creative Invention: Symposium in honor of Antonio Facchetti*, ACS Meeting, San Diego, 3/14/2016
88. (Invited) "Rational Nanostructure Design for High Performance Mg Rechargeable Batteries", *Interplay of Structure & Transport Properties in Materials for Energy Applications*, ACS Meeting, San Diego, 3/16/2016
89. (Invited) "Modification of Magnesium Ion Cathode and Electrolyte for Mg Rechargeable Batteries", TMS Meeting, Orlando, FL, USA, 3/16/2015.
90. (Invited) "Advanced Aqueous Lithium Ion Batteries using Organic Materials", ARPA-E Program Review Meeting, Tempe, AZ, 1/28/2015.
91. (Invited) "Atomic-Level Manipulation of Magnesium Ion Intercalation Materials for High-Density Energy Storage", 2014 Electrochemical Conference on Energy & Environment, Shanghai, China, 3/13/2014.
92. (Invited) "Nanostructure Engineering of Layered Metal Chalcogenides for Magnesium Battery Cathode", TMS Meeting, San Diego, CA, USA, 2/20/2014.
93. (Invited) "High Energy Density Silicon Anodes for Lithium-ion Batteries: Combining Hollow Nanospheres with Conductive Polymer Binder", 245th ACS National Meeting*, Division of Energy and Fuels*, New Orleans, LA, 4/7-11/2013.
94. (Invited) "Nanostructure Design for Efficient Energy Devices", Workshop on Materials Science and Materials Chemistry for Energy, Beijing, China, 9/16-18/2012.
95. (Invited) "Nanostructured Materials and Devices for Energy Harvesting and Storage", Master Lecture in Printed Electronics, San Jose, CA, 12/2011.

(c) University, National Laboratory, and Industry Seminars

96. (Invited) “All-Solid-State Batteries: Materials, Characterization, and Manufacturing”, Department of Mechanical Engineering & Materials Science, Washington in St. Louis, St. Louis, MO, 10/24/2024.
97. (Invited) “All-Solid-State Batteries: Materials, Characterization, and Manufacturing”, Department of Chemistry, University of North Carolina, Chapel Hill, NC, 10/3/2024.
98. (Invited) “Materials and Characterization Innovations for Solid-state Batteries”, National Renewable Energy Laboratory, Golden, CO, 8/21/2024.
99. (Invited) “Materials and Characterization Innovations for Solid-State Batteries”, Department of Mechanical Aerospace and Biomedical Engineering, University of Tennessee Knoxville, Knoxville, TN, 8/15/2024.
100. (Invited) “Materials Innovation for Multivalent and Solid-state Batteries”, Department of Chemical and Biomolecular Engineering, Yonsei University, South Korea, 6/20/2024.
101. (Invited) “Materials Innovation for Multivalent and Solid-state Batteries”, Department of Photonics, National Cheng Kung University, Taiwan, 6/17/2024.
102. (Invited) “Materials Innovation for Multivalent and Solid-state Batteries”, Institute of Physics, Academia Sinica, Taiwan, 6/14/2024.
103. (Invited) “Imaging Lithium-Solid Electrolyte Interface Evolution in All-Solid-State Batteries through Operando Characterizations”, 24M Technologies, Cambridge, MA, 5/30/2024.
104. (Invited) “Materials and Characterization Innovations for Solid-State Batteries”, Department of Mechanical Engineering and Materials Science, Duke University, Durham, NC, 4/3/2024.
105. (Invited) “Materials and Characterization Innovations for Solid-State Batteries”, Department of Materials Science and Engineering, University of Texas Dallas, Richardson, TX, 3/29/2024.
106. (Invited) “Materials Innovations for Multivalent and Solid-State Batteries”, Department of Materials Science and Engineering, University of Wisconsin, Madison, MI, 2/1/2024.
107. (Invited) “Organic Electrode Materials for Multivalent and Solid-state Batteries”, Dresden University of Technology, Dresden, Germany, 9/12/2023.
108. (Invited) “Visualizing Lithium-Solid Electrolyte Interface Evolution via Operando Characterizations in All-solid-state Batteries”, Factorial Energy, Woburn, MA, 5/30/2023.
109. (Invited) “Visualizing Lithium-Solid Electrolyte Interface Evolution via Operando Characterizations in All-solid-state Batteries”, Lyten Corporation, San Jose, CA, 4/12/2023.
110. (Invited) “Visualizing Lithium-Solid Electrolyte Interface Evolution via Operando Characterizations in All-solid-state Batteries”, Prof. Yi Cui’s group, Stanford University, Stanford, CA, 4/11/2023.
111. (Invited) “Next-Generation Batteries for Electric Vehicles and Grid Energy Storage”, Department of Chemical Engineering, Imperial College London, London, UK, 1/27/2023.
112. (Invited) “The Key Challenges for Lithium-metal-based All-Solid-State Batteries”, AMOLF, Amsterdam, Netherland, 1/26/2023.
113. (Invited) “Multidimensional Characterizations for All-Solid-State Batteries”, Ford Motors, Virtual, 10/18/2022.
114. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Department of Industrial and Systems Engineering Seminar, Hong Kong Polytechnic University, Virtual, 9/15/2022.
115. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Materials Science and Engineering Department Seminar, UCLA, Los Angeles, CA, 4/15/2022.

116. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Chemistry and Biochemistry Department Biochemistry Divisional Seminar, Ohio State University, Columbus, OH 4/6/2022.
117. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Materials Science and Engineering/Applied Physics, KAUST, online, 3/31/2022.
118. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Mechanical Science and Engineering, University of Illinois Urbana-Champaign, Urbana, IL, 3/29/2022.
119. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Giner Inc., Online, 3/9/2022.
120. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Chemistry and Biochemistry Department Seminar, George Mason University, Online, 2/11/2022.
121. (Invited) “Multiscale characterizations for solid-state lithium batteries”, Solid-state battery colloquium, Argonne National Laboratory, Online, 1/26/2022.
122. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Materials Science and Engineering, University of Texas Arlington, Online, 10/21/2021.
123. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Materials Science and Engineering, Iowa State University, Online, 10/4/2021.
124. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Lindsay Seminar of Chemical Engineering, Texas A&M University, In person, 9/29/2021.
125. (Invited) “All-solid-state lithium batteries: materials, processing and diagnosis”, SLAC Photon Science Seminar, Online, 4/20/2021.
126. (Invited) “Cobalt-free solid-state lithium batteries”, Nissan North America Battery Group, Online, 3/25/2021.
127. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, ECS Webinar, Online, 2/24/2021.
128. (Invited) “Organic electrode materials design for emerging rechargeable batteries”, Yonsei University Department of Chemical Engineering, Online, 1/18/2021.
129. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, University of Freiburg, Germany, Online, 1/13/2021.
130. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, Mexican Energy Storage Network Webinar Series, Online, 12/11/2020.
131. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, UH Energy Webinar Series, Online, 12/8/2020.
132. (Invited) “Next-generation batteries for electric vehicles and stationary storage”, UH ECE Luncheon, Online, 10/14/2020.
133. (Invited) “Electrolyte dictated organic electrode materials design for beyond lithium ion batteries”, City University at New York Energy Institute, New York, NY, 11/25/2019.
134. (Invited) “Electrolyte dictated organic electrode materials design for beyond lithium ion batteries”, Shell Technology Center Houston, Houston, TX, 11/21/2019.
135. (Invited) “Electrolyte dictated organic electrode materials design for beyond lithium ion batteries”, Department of Chemistry, Binghamton University, Binghamton, NY, 11/1/2019.

136. (Invited) “Electrolyte dictated organic electrode materials design for beyond lithium ion batteries”, Department of Materials Science and NanoEngineering, Rice University, Houston, TX, 10/10/2019.

137. (Invited) “Electrolyte dictated organic electrode materials design for beyond lithium ion batteries”, Energy Storage and Membrane Materials Group, Oak Ridge National Laboratory, Oak Ridge, TN, 10/3/2019.

138. (Invited) “Electrolyte dictated organic electrode materials design for beyond lithium ion batteries”, Institute of Physics Chinese Academy of Sciences, Beijing, China, 8/21/2019.

139. (Invited) “Electrolyte dictated organic electrode materials design for beyond lithium ion batteries”, College of Materials and Engineering, University of Chinese Academy of Sciences, Beijing, China, 8/20/2019.

140. (Invited) “Developing all-solid-state batteries with organic electrode materials”, Hanyang University, Seoul, Korea, 6/17/2019.

141. (Invited) “Positioning organic electrode materials in the battery landscape”, Institut des Maerlaux Jean Rouxel, CNRS, Nantes, France, 11/7/2018

142. (Invited) “Positioning organic electrode materials in the battery landscape”, Texas Center for Superconductivity, Houston, TX, 10/18/2018

143. (Invited) “Versatile organic electrode materials for long life safe batteries”, College of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China 6/12/2018

144. (Invited) “Versatile organic electrode materials for long life safe batteries”, Energy Processes & Materials Division, Pacific Northwest National Lab, 6/7/2018

145. (Invited) “Versatile organic electrode materials for long life safe batteries”, SABIC, Sugar Land, Texas 6/5/2018

146. (Invited) “Electrolyte dictated materials design for beyond lithium ion batteries”, Shenzhen Institutes of Advanced Technology Chinese Academy of Sciences, Shenzhen, China, 5/11/2018

147. (Invited) “Electrolyte dictated materials design for beyond lithium ion batteries”, College of Materials Science and Engineering, Zhejiang University of Technology, Hangzhou, China 5/9/2018

148. (Invited) “Versatile organic electrode materials for long life safe batteries”, Ningbo Material Technology and Engineering Institute, Ningbo, China, 5/8/2018

149. (Invited) “Versatile organic electrode materials for long life safe batteries”, College of Chemical and Biomolecular Engineering, Zhejiang University, Hangzhou, China, 5/7/2018

150. (Invited) “Versatile organic electrode materials for long life safe batteries”, Department of Materials Science and Engineering, University of California Los Angeles, 4/13/2018

151. (Invited) “Electrolyte dictated materials design for beyond lithium-ion batteries”, Department of Nanoengineering, University of California San Diego, 4/11/2018

152. (Invited) “Electrolyte dictated materials design for beyond lithium-ion batteries”, Department of Materials Science and Engineering, Iowa State University, 2/22/2018

153. (Invited) “Electrolyte dictated materials design for beyond lithium-ion batteries”, Department of Applied Physics & Applied Mathematics, Columbia University, 12/1/2017

154. (Invited) “Electrolyte dictated materials design for beyond lithium-ion batteries”, Department of Materials Science and Engineering, Fudan University, 11/18/2017

155. (Invited) “Electrolyte dictated materials design for beyond lithium-ion batteries”, Center for Advanced Computing and Data Systems, University of Houston, 11/9/2017

156. (Invited) “Electrolyte dictated materials design for beyond lithium-ion batteries”, Department of Materials Science and Engineering, Texas A&M University, 10/23/2017

157. (Invited) “Materials design for beyond lithium-ion batteries”, Department of Mechanical and Aerospace Engineering, West Virginia University, 9/8/2017

158. (Invited) “Two-Dimensional Materials and Organic Redox Materials for Mg Rechargeable Batteries”, School of Materials Science and Engineering, Nanjing University of Posts and Telecomm, 6/26/2017

159. (Invited) “Two-Dimensional Materials and Organic Redox Materials for Mg Rechargeable Batteries”, School of Energy, Beijing University of Chemical Technology, 6/21/2017

160. (Invited) “Designing Two-Dimensional Materials and Conjugated Redox Polymers for Safe and Low-Cost Energy Storage”, School of Materials Science and Engineering, South University of Science and Technology, 1/6/2017

161. (Invited) “Designing Two-Dimensional Materials and Conjugated Redox Polymers for Safe and Low-Cost Energy Storage”, School of Chemical Engineering, Nantong University, 12/30/2016

162. (Invited) “Designing Two-Dimensional Materials and Conjugated Redox Polymers for Safe and Low-Cost Energy Storage”, Department of Chemical Engineering and Material Science, Michigan State University, 10/27/2016

163. (Invited) “Two-Dimensional Materials and Redox-Active Organic Materials for Sustainable Stationary Energy Storage”, School of Materials Science and Engineering, Tsinghua University, Beijing, China, 7/7/2016

164. (Invited) “Two-Dimensional Materials and Redox-Active Organic Materials for Sustainable Stationary Energy Storage”, Institute of Applied Chemistry and Engineering, Nankai University, Tianjing, China, 7/5/2016

165. (Invited) “Two-Dimensional Materials and Redox-Active Organic Materials for Sustainable Stationary Energy Storage”, Institute of Fundamental and Frontier Sciences, University of Electronic Science and Technology of China, Chengdu, China, 6/23/2016

166. (Invited) “Two-Dimensional Materials and Redox-Active Organic Materials for Sustainable Stationary Energy Storage”, School of Materials Science and Engineering, Nanjing University of Science and Technology, Nanjing, China, 6/20/2016

167. (Invited) “Designing Two-Dimensional Materials and Conjugated Redox Polymers for Safe and Low-Cost Energy Storage”, Department of Chemical and Biochemical Engineering, University of Houston, Houston, TX 4/29/2016

168. (Invited) “Designing Two-Dimensional Materials and Conjugated Redox Polymers for Safe and Low-Cost Energy Storage”, Department of Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, 4/1/2016

169. (Invited) “Designing Two-Dimensional Materials and Conjugated Redox Polymers for Safe and Low-Cost Energy Storage”, Department of Materials and NanoEngineering, Rice University, Houston, TX, 3/24/2016

170. (Invited) “Low-Cost and Safe Magnesium Batteries”, Tianqi Lithium Industries Co., Sichuan, China 7/6/2015.

171. (Invited) “Interlayer-Expanded Molybdenum Disulfide Nanocomposites for Electrochemical Magnesium Storage”, Florida International University, Miami, FL 3/21/2015

172. (Invited) “Modification of Magnesium Ion Cathode and Electrolyte for Mg Rechargeable Batteries”, Department of Sustainable Energy Technologies, Brookhaven National Laboratory, Upton, NY

6/13/2014

173. (Invited) “Recent Development of Magnesium Rechargeable Batteries”, School of Materials Science and Engineering, Wuhan Institute of Technology, Wuhan, China 3/10/2014
174. (Invited) “Advanced Aqueous Lithium Ion Batteries using Organic Materials”, ARPA-E RANGE Kick-off Meeting, Kennedy Space Center, Cape Canaveral, FL, 1/28/2014.
175. (Invited) “Rational Nanostructure Design for High Energy Density Batteries”, South University of Science and Technology of China, Shenzhen, China 12/13/2013.
176. (Invited) “Rational Nanostructure Design for High Energy Density Batteries”, Department of Electrical Engineering, Tsinghua University, Beijing, China 9/17/2013.
177. (Invited) “Rational Nanostructure Design for High Energy Density Batteries”, Department of Environmental Engineering, University of Shanghai for Science and Technology, Shanghai, China, 9/10/2013.
178. (Invited) “Nanostructure Design for Efficient Energy Devices”, Schlumberger Sugar Land Technology Center, Sugar Land, TX, 5/9/2013.
179. (Invited) “Nanostructure Design for Efficient Energy Devices”, Southwest Research Institute, San Antonio, TX, 3/13/2013.
180. (Invited) “Rational Nanostructure Design for High Energy Density Batteries”, Baylor College of Medicine, Houston, TX 3/4/2013.
181. (Invited) “Rational Nanostructure Design for High Energy Density Batteries”, Department of Mechanical Engineering, University of Houston, Houston, TX, 1/17/2013.
182. (Invited) “Rational Nanostructure Design for High Energy Density Batteries”, School of Materials Science and Engineering, Beijing University of Technology, Beijing, 9/19/2012.
183. (Invited) “Nanostructure Design for Efficient Energy Devices”, Department of Mechanical Engineering, Yale University, New Haven, CT 5/2/2012.
184. (Invited) “Nanostructure Design for Efficient Energy Devices”, Department of Materials Science and Engineering, University of Virginia, Charlottesville, VA 4/30/2012.
185. (Invited) “Nanostructure Design for Efficient Energy Devices”, College of Engineering, Dartmouth College, Hanover, NH 4/26/2012.
186. (Invited) “Nanostructure Design for Efficient Energy Devices”, Department of Mechanical Engineering, University of Washington, Seattle, WA 4/16/2012.
187. (Invited) “Nanostructure Design for Efficient Energy Devices”, Department of Materials Science and Engineering, University of Wisconsin Madison, Madison, WI 4/5/2012.
188. (Invited) “Nanostructure Design for Efficient Energy Devices”, Department of Electrical and Computer Engineering, University of Houston, Houston, TX 4/2/2012.
189. (Invited) “Nanostructure Design for Efficient Energy Devices”, Department of Mechanical and Automation Engineering, Chinese University of Hong Kong, Hong Kang, 3/27/2012.
190. (Invited) “Nanostructure Design for Efficient Energy Devices”, Suzhou Institute of Nanotechnology, Suzhou, China 3/23/2012.
191. (Invited) “Nanostructure Design for Efficient Energy Devices”, School of Engineering, Nanjing University, Nanjing, China 3/21/2012.
192. (Invited) “Nanostructure Design for Efficient Energy Devices”, Frontier Institute of Science and

Technology, Xi'an Jiaotong University, Xi'an, China 3/19/2012.

193. (Invited) "Nanostructure Design for Efficient Energy Devices", Department of Mechanical Engineering, EPFL, Lausanne, Switzerland 3/8/2012.
194. (Invited) "Nanostructure Design for Efficient Energy Devices", Department of Mechanical Engineering, Johns Hopkins University, Baltimore, MD 2/16/2012.
195. (Invited) "Nanostructure Design for Efficient Energy Devices", Institute of Materials Research and Engineering, Singapore, 2/3/2012.
196. (Invited) "Nanostructure Design for Efficient Energy Devices", Nanyang Technology University, Singapore, 2/1/2012.
197. (Invited) "Nanostructure Design for Efficient Energy Devices", Department of Mechanical Engineering, University of Texas San Antonio, San Antonio, TX 1/26/2012.
198. (Invited) "Nanostructure Design for Efficient Energy Devices", Department of Materials Science and Engineering, Drexel University, Philadelphia, PA12/13/2011.
199. (Invited) "Nanostructured Energy Devices: Polymer Solar Cells and Lithium Ion Batteries", Institute of Chemistry of Chinese Academy of Sciences, China, 9/2011.
200. (Invited) "Nanostructured Energy Devices: Polymer Solar Cells and Lithium Ion Batteries", Department of Materials Science, Fudan University, Shanghai, China, 9/2011.

TEACHING EXPERIENCE

University of Houston, Department of Electrical and Computer Engineering

Spring 2024	Advanced Batteries, ECE 6308, Instructor
Spring 2023	Special Topics in Electrochemical Systems, ECE 6397, Instructor
Fall 2022	MSE Seminar, MTLS 6111, Coordinator
Spring 2022	Advanced Batteries, ECE 6308, Instructor
Fall 2021	Senior Design II, ECE 4336, Facilitator
Spring 2021	Senior Design I, ECE 4335, Facilitator
Fall 2020	Advanced Batteries II, ECE 6397, Instructor
Spring 2020	Advanced Batteries, ECE 6308, Instructor
Fall 2019	Senior Design I, ECE 4335, Facilitator
Spring 2019	Advanced Batteries, ECE 6308, Instructor
Fall 2017	Introduction to Nanotechnology, ECE 5319/ECE 6306/MECE 5319/CHEE5319/CHEE 6319/MLTS 6319, Instructor
Fall 2017	Nanotechnology Laboratory, ECE 5119, Instructor
Spring 2017	Advanced Batteries: Principles, Materials, and Devices, ECE 6308, Instructor
Fall 2016	Introduction to Nanotechnology, ECE 5319/ECE 6306/MECE 5319/CHEE5319/CHEE 6319/MLTS 6319, Instructor
Fall 2016	Nanotechnology Laboratory, ECE 5119, Instructor
Fall 2015	Introduction to Nanotechnology, ECE 5319/ECE 6306/MECE 5319/CHEE5319/CHEE 6319/MLTS 6319, Instructor
Fall 2015	Nanotechnology Laboratory, ECE 5119, Instructor

Spring 2015 Advanced Batteries: Principles, Materials, and Devices, ECE 6397, Instructor
Fall 2014 Introduction to Nanotechnology, ECE 5319/ECE 6306/MECE 5319/CHEE5319/CHEE 6319/MLTS 6319, Instructor
Fall 2014 Nanotechnology Laboratory, ECE 5119, Instructor
Spring 2014 Advanced Batteries: Principles, Materials, and Devices, ECE 6397, Instructor
Fall 2013 Introduction to Nanotechnology, ECE 5319/ECE 6306/MECE 5319/CHEE5319/CHEE 6319/MLTS 6319, Instructor
Fall 2013 Nanotechnology Laboratory, ECE 5119, Instructor
Spring 2013 Advanced Batteries: Principles, Materials, and Devices, ECE 5397/6397, Instructor

Stanford University, Department of Materials Science and Engineering

Fall 2011 Principles of Batteries, Short course, Contributor

UCLA, Department of Materials Science and Engineering

Fall 2004 Science of Engineering Materials, MSE 104, Teaching Assistant
Spring 2004 Science of Semiconductors, MSE 121, Teaching Assistant

STUDENT SUPERVISION

Postdoctoral Fellows:

Yang Yu (2024-Present)
Jiaming Zhang (2024-Present)
Alaeddine Lakraychi (2021−2024), Current: Research Assistant Professor, Univ. of Houston
Lihong Zhao (2020−2023), Current: Assistant Professor, Univ. of Houston
Yanliang Liang (2012−2022), Current: CTO, LiBeyond LLC
Ye Zhang (2021−2022), Current: Senior Scientist, LiBeyond LLC
Benjamine Emley (2022−2022), Current: Battery Technical Specialist, Ford Motors
Meng Shang (2021−2021)
Jibo Zhang (2018−2020), Current: Postdoc, Harvard University
Hongxu Dong (2019), Current: Senior Lead at Infosys
Xiaowei Chi (2016-2018), Current: Professor of Institute of Ceramics, Chinese Academy of Science, China
Yi Shi (2017-2018), Current: Professor of Sun Yat-sen University, China
Qing Ji (2016), Current: Professor of Maotai University
Wenwen Deng (2016−2017), Current: Suzhou University of Science and Technology, China
Pu Hu (2016−2017), Current: Professor of Wuhan Institute of Technology, China
Swaminathan Venkatesan (2015-2016), Current: Data Scientist at M Science
Yaoguang Rong (2014-2015), Current: Professor of Huazhong University of Science and Technology, China
Qingyou An (2014−2015), Current: Professor of Wuhan University of Technology, China
Hyun Deog Yoo (2013−2015), Current: Professor of Chemistry at Pusan National University, South Korea
Zelang Jian (2013−2014), Current: Professor of Wuhan University of Technology, China

Graduate Students:
Changyu Yuan (2024-Present)

Hao Wang (2023-Present)
Mai Le (2022−Present)
Ifeanyi Emmanuel Udom (2022−Present)
Wen Ren (2022−Present)
Jie Zheng (2022−Present)
Leonard Jiang (2021−Present)
Liqun Guo (2021−Present)
Zhaoyang Chen (2019−Present)
Chaoshan Wu (2020−2023), Current: Battery Engineer, Albemarle Corporation.
Benjamin Emley (2016−2021), Current: Battery Technical Specialist, Ford Motors
Ye Zhang (2016−2021), Current: Senior Scientist, LiBeyond LLC
Karun Kumar Rao (Ph.D. 2016−2020), Current: Senior Staff, Johns Hopkins University Applied Physics Laboratory
Fang Hao (Ph.D. 2015−2019), Current: R&D Manager, Factorial Energy
Hui Dong (Ph.D. 2015−2019), Current: Principal Engineer at Our Next Energy (ONE).
Jing Yan (Ph.D. 2013−2017), Current: Presidential Assistant Professor, National University of Singapore
Saman Gheytani (Ph.D. 2013−2017), Current: Product Development Engineer at Lam Research
Yifei Li (Ph.D. 2012−2016), Current: Product manager at Nio Inc.
Kuan-Yi Lee (M.S. 2014−2016), Current: Software engineer at ProQuest
Shiyang Zhao (M.S. 2014−2015), Current: unknown.

Visiting Students and Postdocs: Xinpeng Han (2019−2020), Xiaojun Wang (2019−2020), Hongzhi Zheng (2019−2002), Yang Chen (2018−2019), Rui Guo (2016−2017), Zhixuan Meng (2014), Xiangyue Meng (2014), Xiaoxue Zhang (2014)

Visiting Professors: Xiaoxia Wang (2019−2020), Qiang Ru (2014-2015), Yufeng Zhao (2014−2015)

Undergraduate Students: Sadia Ashraf, Matthew Andersen, Lateefat Alabi, Kayshewa Chamupathi, Katelyn Dykas, Harrison Graham, Steve Guzman, Junyoung Kim, Chang Li, Gan Liu, Raymond McCoy, Matthew Patton, Troy A. Pena, David Pineda, Stephanie Roohi, Suzanne Russo, Sarah Siemann, Robert Sipowicz, Sterling Voss, Audrey Wang, Bin Wang, Joseph Whitehouse, Yu Xing, Zijing Zhang.

High School Students: Andrew Loh, Sam Lin, Amy Zhang, Alan Yao, Kyle Affeldt, Tiffany Au, Jamie Bassett, Kartik Chamarti, Stephan Xie