

Yanliang (Leonard) Liang

Co-Founder and CTO
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Education

Postdoctoral fellow in Cullen College of Engineering and Texas Center for Superconductivity (TcSUH) University of Houston, Houston, TX Advisor: Yan Yao	2012–2014
Ph. D. in Materials Physics and Chemistry Nankai University, Tianjin, China Advisor: Jun Chen	2012
B. S. in Chemistry Nankai University, Tianjin, China	2007

Work Experience

Co-Founder and CTO LiBeyond LLC, Houston, TX	2022–present
Research Assistant Professor Cullen College of Engineering University of Houston, Houston, TX	2018–2022
Research Associate Cullen College of Engineering University of Houston, Houston, TX	2014–2018

Grants and Projects

1. Title: “Reliable Fabrication of All-Solid-State Lithium Batteries with High Cell-Level Specific Energy”
Role: Principal Investigator
Amount: \$200,000
Sponsor: U.S. Department of Energy, Office of Science
Period: 06/27/2022 to 04/26/2023
2. Title: “Lithium and transition metal-free high-energy fast-charging batteries”
Role: Co-Principal Investigator (40%)
Amount: \$1,500,000
Sponsor: U. S. Department of Energy, ARPA-E
Period: 06/26/2022 to 06/26/2025
3. Title: “Bioderived and biodegradable redox polymers for flexible wearable batteries”
Role: Co-Principal Investigator
Amount: \$150,000
Sponsor: Meta Platforms, Inc.
Period: 04/01/2022 to 09/31/2023
4. Title: “Multidimensional diagnostics of the interface evolutions in solid-state lithium batteries” (DE-EE0008864)
Role: Co-Principal Investigator (33%)
Sponsor: U. S. Department of Energy, Vehicle Technology Office
Amount: \$1,000,000

Period: 10/01/2019 to 03/31/2023

Publications (* correspondence author; † equal contribution)

1. **Yanliang Liang** “A two-salt solution for batteries” *Nat. Sustain.* 2023, 6, 239–240.
2. **Yanliang Liang**, Yan Yao “Designing modern aqueous batteries” *Nat. Rev. Mater.* 2023, 8, 109–122 (front cover).
3. Jianing Meng, Dr. Alexandra Robles, Dr. Said Jalife, Wen Ren, Ye Zhang, Dr. Lihong Zhao, **Yanliang Liang***, Judy I. Wu*, Ognjen Š. Miljanić*, Yan Yao* “Cyclotetrazol derivatives for electrochemical lithium-ion storage” *Angew. Chem. Int. Ed.* 2023, 62, e202300892 (front cover).
4. 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.
5. 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” *Mater. Today Phys.* 2021, 18, 100397.
6. 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 Lett.* 2020, 6, 201–207.
7. **Yanliang Liang**, Hui Dong, Doron Aurbach, Yan Yao “Current status and future directions of multivalent metal-ion batteries” *Nat. Energy* 2020, 5, 646–656.
8. 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 electrolyte” *Nat. Energy* 2020, 5, 1043–1050.
9. **Yanliang Liang**, Yan Yao “Halfway through” *Nat. Energy* 2019, 4, 10–11.
10. Hui Dong, **Yanliang Liang***, Oscar Tutusaus, Rana Mohtadi, Ye Zhang, Fang Hao, Yan Yao* “Directing Mg-storage chemistry in organic polymers toward high-energy Mg batteries” *Joule* 2019, 3, 782–793 (front cover).
11. Yi Shi,† Yang Chen,† **Yanliang Liang**,† Justin Andrews, Hui Dong, Mengying Yuan, Wenye Ding, Sarbajit Banerjee, Haleh Ardebili, Megan L Robertson, Xiaoli Cui, Yan Yao “Chemically inert covalently networked triazole-based solid polymer electrolytes for stable all-solid-state lithium batteries” *J. Mater. Chem. A* 2019, 7, 19691–19695.
12. 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 Appl. Energy Mater.* 2019, 2, 1608–1615.
13. **Yanliang Liang**, Yan Yao “Positioning organic electrode materials in the battery landscape” *Joule* 2018, 2, 1690–1706.
14. 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” *Angew. Chem. Int. Ed.* 2018, 57, 2630–2634 (front cover).
15. **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” *Nat. Mater.* 2017, 16, 841–848.
16. **Yanliang Liang***, Yan Yao* “Advancing electrolytes towards stable organic batteries” *Gen. Chem.* 2017, 9, 207–212.

17. Qizhang Huang, Yueyun Fang, Jifu Shi*, **Yanliang Liang***, Yanqing Zhu, and Gang Xu* “Flower-like molybdenum disulfide for polarity-triggered accumulation/release of small molecules” *ACS Appl. Mater. Interfaces* 2017, 9, 36431–36437.
18. Zelang Jian,† **Yanliang Liang**,† Ismael A. Rodríguez Pérez, Yan Yao, Xiulei Ji “Poly(anthraquinonyl sulfide) cathode for potassium-ion batteries” *Electrochem. Commun.* 2016, 71, 5–8.
19. **Yanliang Liang**, Zhihua Chen, Yan Jing, Yaoguang Rong, Antonio Facchetti, Yan Yao “Heavily n-dopable π -conjugated redox polymers with ultrafast energy storage capability” *J. Am. Chem. Soc.* 2015, 137, 4956–4959 (JACS spotlight & ACS Editors’ Choice).
20. **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 Lett.* 2015, 15, 2194–2202.
21. **Yanliang Liang**, Peng Zhang, Jun Chen “Function-oriented design of conjugated carbonyl compound electrodes for high energy lithium batteries” *Chem. Sci.* 2013, 4, 1330–1337.
22. **Yanliang Liang**, Peng Zhang, Siqi Yang, Zhanliang Tao, Jun Chen “Fused heteroaromatic organic compounds for high-power electrodes of rechargeable lithium batteries” *Adv. Energy Mater.* 2013, 3, 600–605.
23. **Yanliang Liang**, Zhanliang Tao, Jun Chen “Organic electrode materials for rechargeable lithium batteries” *Adv. Energy Mater.* 2012, 2, 742–769 (inside front cover).
24. **Yanliang Liang**, Rujun Feng, Siqi Yang, Hua Ma, Jing Liang, Jun Chen “Rechargeable Mg batteries with graphene-like MoS₂ cathode and ultrasmall Mg nanoparticle anode”, *Adv. Mater.* 2011, 23, 640–643.
25. **Yanliang Liang**, Bo Peng, Jing Liang, Zhanliang Tao, Jun Chen “Triphenylamine-based dyes bearing functionalized 3,4-propylenedioxythiophene linkers with enhanced performance for dye-sensitized solar cells”, *Org. Lett.* 2010, 12, 1204–1207.
26. **Yanliang Liang**, Fangyi Cheng, Jing Liang, Jun Chen “Triphenylamine-based ionic dyes with simple structures: broad photoresponse and limitations on open-circuit voltage in dye-sensitized solar cells” *J. Phys. Chem. C* 2010, 114, 15842–15848.
27. **Yanliang Liang**, Bo Peng, Jun Chen “Correlating dye adsorption behavior with the open-circuit voltage of triphenylamine-based dye-sensitized solar cells” *J. Phys. Chem. C* 2010, 114, 10992–10998.
28. Alae Eddine Lakraychi, Erin S Picton, **Yanliang Liang**, Devin L Shaffer, Yan Yao “Suppressing shuttle effect with a size-selective covalent organic framework based bilayer membrane” *ACS Energy Lett.* 2023, 8, 5032–5040,
29. 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 the silver–carbon interlayer in sheet-type all-solid-state lithium–metal batteries” *Nano Lett.* 2023, 23, 4415–4422.
30. Benjamin Emley, Chaoshan Wu, Lihong Zhao, Qing Ai, **Yanliang Liang**, Zhaoyang Chen, Liqun Guo, Tanguy Terlier, Jun Lou, Zheng Fan, Yan Yao “Impact of fabrication methods on binder distribution and charge transport in composite cathodes of all-solid-state batteries” *Mater. Futures* 2023, 2, 045102.
31. 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” *Adv. Energy Mater.* 2023, 13, 2300679.
32. 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 operando reflection interference microscopy” *Nat. Nanotech.* 2023, 18, 780–789.
33. 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 chemomechanical mapping of organic composite cathodes for sulfide-based solid-state batteries” *ACS Energy Lett.* 2023, 8, 1107–1113.
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. Lihong Zhao, Alae Eddine Lakraychi, Zhaoyang Chen, **Yanliang Liang**, and Yan Yao “Roadmap of Solid-State Lithium–Organic Batteries toward 500 Wh kg^{−1}” *ACS Energy Lett.* 2021, 6, 3287–3306.
36. 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.
37. 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 transition metal oxide cathodes” *Nano Energy* 2021, 87, 106081.
38. Philippe Poizot, Joël Gaubicher, Stéven Renault, Lionel Dubois, **Yanliang Liang**, Yan Yao “Opportunities and challenges for organic electrodes in electrochemical energy storage” *Chem. Rev.* 2020, 120, 6490–6557.
39. Yan Jing, **Yanliang Liang**, Saman Gheytani, Yan Yao “A quinone anode for lithium ion batteries in mild aqueous electrolytes” *ChemSusChem* 2020, 13, 2250–2255.
40. Ye Zhang, **Yanliang Liang**, Hui Dong, Xiaojun Wang, Yan Yao “Charge storage mechanism of a quinone polymer electrode for zinc-ion batteries” *J. Electrochem. Soc.* 2020, 167, 070558.
41. 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” *2019 IEEE 19th International Conference on Nanotechnology (IEEE-NANO), Macao*, 2019, 59–62.
42. 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.
43. Fang Hao, Fudong Han, **Yanliang Liang**, Chunsheng Wang, Yan Yao “Architectural design and fabrication approaches for solid-state batteries” *MRS Bull.* 2018, 43, 775–781.
44. Xiaowei Chi, **Yanliang Liang**, Yan Yao, “Electrolyte dictated materials design for beyond lithium ion batteries” *Proc. SPIE* 2018, 10663.
45. 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” *Nat. Commun.* 2017, 8, 339.
46. Saman Gheytani, **Yanliang Liang**, Feilong Wu, Yan Jing, Hui Dong, Karun K. Rao, Xiaowei Chi, Fang Fang, Yan Yao “An aqueous Ca-ion battery” *Adv. Sci.* 2017, 1700465.
47. Yan Jing, **Yanliang Liang**, Saman Gheytani, Yan Yao “Cross-conjugated oligomeric quinones for high performance organic batteries” *Nano Energy* 2017, 37, 46–52.
48. Yifei Li, Qinyou An, Yingwen Cheng, **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.
49. Swaminathan Venkatesan, Fang Hao, Junyoung Kim, Yaoguang Rong, Zhuan Zhu, **Yanliang Liang**, Jiming Bao, Yan Yao “Moisture-driven phase transition for improved perovskite solar cells with reduced trap-state density” *Nano Res.* 2017, 10, 1413–1422.
 50. Saman Gheytni, **Yanliang Liang**, Yan Jing, Jeff Q. Xu, Yan Yao “Chromate conversion coated aluminium as a lightweight and corrosion-resistant current collector for aqueous lithium-ion batteries” *J. Mater. Chem. A* 2016, 4, 395–399 (inside front cover; hot paper).
 51. Hui Dong, Yifei Li, **Yanliang Liang**, Guosheng Li, Cheng-Jun Sun, Yang Ren, Yuhao Lu, Yan Yao “A magnesium–sodium hybrid battery with high operating voltage” *Chem. Commun.* 2016, 52, 8263–8266.
 52. Hyun Deog Yoo, Yifei Li, **Yanliang Liang**, Yucheng Lan, Feng Wang, Yan Yao “Intercalation pseudocapacitance of exfoliated molybdenum disulfide for ultrafast energy storage” *ChemNanoMat* 2016, 2, 688–691 (front cover).
 53. Jing Shuai, Hyun Deog Yoo, **Yanliang Liang**, Yifei Li, Yan Yao, Lars C Grabow “Density functional theory study of Li, Na, and Mg intercalation and diffusion in MoS₂ with controlled interlayer spacing” *Mater. Res. Express* 2016, 3, 064001.
 54. Hector A Calderon, **Yanliang Liang**, Hyun Deog Yoo, Yifei Li, FC Hernandez, C Kisielowski, Yan Yao “Low Dose Electron Microscopy of Interlayer Expanded Molybdenum Disulfide Nanocomposites” *Microsc. Microanal.* 2015, 21, 1057–1058.
 55. Yifei Li, **Yanliang Liang**, Francisco C. Robles Hernandez, Hyun Deog Yoo, Qinyou An, Yan Yao “Enhancing sodium-ion battery performance with interlayer-expanded MoS₂–PEO nanocomposites” *Nano Energy* 2015, 15, 453–461.
 56. Zelang Jian, Mingbo Zheng, **Yanliang Liang**, Xiaoxue Zhang, Saman Gheytni, Yucheng Lan, Yi Shi and Yan Yao “Li₃VO₄ anchored graphene nanosheets for long-life and high-rate lithium-ion batteries” *Chem. Comm.* 2015, 51, 229–231.
 57. 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. Mater. Interfaces*, 2015, 7, 7001–7007.
 58. Zelang Jian, Wenze Han, **Yanliang Liang**, Yucheng Lan, Zheng Fang, Yong-sheng Hu, Yan Yao “Carbon-coated rhombohedral Li₃V₂(PO₄)₃ as both cathode and anode materials for lithium-ion batteries: electrochemical performance and lithium storage mechanism” *J. Mater. Chem. A*. 2014, 2, 20231–20236.
 59. Yuede Pan, Yan Wang, **Yanliang Liang**, Zhanliang Tao, Jun Chen “Promoted hydrogen release from ammonia borane with mannitol via a solid-state reaction route”, *Dalton Trans.* 2012, 41, 871–875.
 60. Kai Zhang, Ling Wang, **Yanliang Liang**, Siqi Yang, Jing Liang, Fangyi Cheng, Jun Chen “A thermally and electrochemically stable organic hole-transporting material with an adamantane central core and triarylamine moieties”, *Synth. Met.* 2012, 162, 490–462.
 61. Xiaolong Zhang, Fangyi Cheng, Kai Zhang, **Yanliang Liang**, Siqi Yang, Jing Liang, Jun Chen “Facile polymer-assisted synthesis of LiNi_{0.5}Mn_{1.5}O₄ with a hierarchical micro–nano structure and high rate capability” *RSC Adv.* 2012, 2, 5669–5675.
 62. Shengjie Peng, **Yanliang Liang**, Fangyi Cheng, Jing Liang “Size-controlled chalcopyrite CuInS₂ nanocrystals: One-pot synthesis and optical characterization”, *Sci. China Chem.* 2011, 55, 1236–1241.
 63. Jifu Shi, Ling Wang, **Yanliang Liang**, Shengjie Peng, Fangyi Cheng, Jun Chen “All-solid-state dye-sensitized solar cells with alkyloxy-imidazolium iodide ionic polymer/SiO₂ nanocomposite

electrolyte and triphenylamine-based organic dyes”, *J. Phys. Chem. C* 2010, *114*, 6814–6821.

64. Jia Wang, **Yanliang Liang**, Jin Qu “Boiling water-catalyzed neutral and selective *N*-Boc deprotection”, *Chem. Commun.* 2009, 5144–5146.
65. Jifu Shi, Shengjie Peng, Juan Pei, **Yanliang Liang**, Fangyi Cheng, Jun Chen “Quasi-solid-state dye-sensitized solar cells with polymer gel electrolyte and triphenylamine-based organic dyes” *ACS Appl. Mater. Inter.* 2009, *1*, 944–950.
66. Juan Pei, Shengjie Peng, Jifu Shi, **Yanliang Liang**, Zhanliang Tao, Jing Liang, Jun Chen “Triphenylamine-based organic dye containing the diphenylvinyl and rhodanine-3-acetic acid moieties for efficient dye-sensitized solar cells”, *J. Power Sources* 2009, *187*, 620–626.
67. Shengjie Peng, Jifu Shi, Juan Pei, **Yanliang Liang**, Fangyi Cheng, Jing Liang, Jun Chen “Ni_{1-x}Pt_x (*x* = 0–0.08) films as the photocathode of dye-sensitized solar cells with high efficiency” *Nano Res.* 2009, *2*, 484–492.

Patents

1. Yan Yao, **Yanliang Liang** “High ionic conductivity rechargeable solid state batteries with an organic electrode” US 16,083,994, 2020 (granted).
2. Yan Yao, **Yanliang Liang**, Yan Jing, Saman Gheytani “Lead-acid batteries with fast charge acceptance” US 10,522,875, 2019 (granted).
3. Yan Yao, **Yanliang Liang** “Aqueous batteries with organic electrode materials” US 10,411,262, 2019 (granted).
4. Yan Yao, **Yanliang Liang** “Aqueous batteries with organic electrode materials” CN 106463781, 2019 (granted).
5. Yan Yao, **Yanliang Liang** “Aqueous batteries with organic electrode materials” JP 6490664 B2, 2019 (granted).
6. Yan Yao, **Yanliang Liang** “Rechargeable alkaline battery using organic materials as negative electrodes” US 10,033,039, 2018 (granted)
7. Yan Yao, **Yanliang Liang** “Non-lithium metal ion battery electrode material architecture” US 9,745,205, 2017 (granted).
8. Yan Yao, **Yanliang Liang** “Non-lithium metal ion battery electrode material architecture” US 9,725,331, 2017 (granted).
9. Yan Yao, **Yanliang Liang** “High ionic conductivity rechargeable solid state batteries with an organic electrode” International Application No.: PCT/US2017/022025, 2017.
10. Jun Chen, **Yanliang Liang**, Zhanliang Tao, Peng Zhang “Rechargeable lithium batteries with fused aromatic quinone cathodes” China Patent No. CN103022496A, 2012 (granted).
11. Jun Chen, **Yanliang Liang**, Zhanliang Tao, Rujun Feng, Hua Ma, Jing Liang “Fabrication of a high performance rechargeable magnesium battery” China Patent No. CN102024996A, 2011 (granted).
12. Jing Liang, Shengjie Peng, **Yanliang Liang**, Fangyi Cheng, Zhanliang Tao, Jun Chen “A thin-film solar cell based on chalcogenide nanocrystals” China Patent No. CN102169910A, 2011 (granted).
13. Jun Chen, Juan Pei, **Yanliang Liang**, Zhanliang Tao, Jing Liang, Feng Gao “A triphenylamine dye for dye-sensitized solar cells” China Patent No. CN101362863, 2009 (granted).

Presentations at Conferences and Meetings

Conferences

(Oral presentation) “Organic Magnesium Batteries: The Way to Commercialization?”, Organic

Battery Day 2022, Houston, TX, October 13–14, 2022

(Invited talk) “Electrolyte-dictated organic redox materials design for beyond-lithium-ion batteries”, 256th ACS National Meeting, Boston, MA, August 19–23, 2018

(Oral presentation) “Universal aqueous energy storage in organic electrodes”, 231st ECS Meeting, New Orleans, LA, May 28–June 1, 2017

(Oral presentation) “Transforming two-dimensional transition metal chalcogenides for high capacity rechargeable magnesium batteries”, MRS Spring Meeting & Exhibit, Phoenix, AZ, March 28–April 1, 2016

(Oral presentation) “Heavily n-dopable π -conjugated redox polymers with ultrafast energy storage capability”, MRS Spring Meeting & Exhibit, Phoenix, AZ, March 28–April 1, 2016

Industry Seminars

One-day workshop for Sinochem Group with lectures and lab tours (2018)

Professional Services

Outreach activities

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 Research Experiences for Undergraduates lab tour (2019)

International Sustainable World (Energy, Engineering & Environment) Project Olympiad (I-SWEEP) International Science Fair judge (2014)

Journal review

ACS Appl. Energy Mater., ACS Appl. Mater. Interfaces, ACS Omega, Appl. Nanosci., Batt. Energy, Carbon, Chem, Chem. Commun., Chem. Mater., Chem. Sci., Chin. Chem. Lett., CrystEngComm, Electrochem. Commun., Electrochim. Acta, Energy Environ. Sci., eTransportation, Front. Chem., J. Magnes. Alloy, J. Mater. Chem. A, J. Phys. Chem., J. Power Sources, Joule, Nano Energy, Nano Lett., Nat. Commun., Nat. Energy, Nat. Rev. Mater., Nat. Sustain., New J. Chem., Polymer, Proc. Natl. Acad. Sci., RSC Adv., Sci. Adv., Sci. Rep.

Student Mentoring and Guest Lectures

Mentored graduate students: Hui Dong, Benjamin Emley, Saman Gheytni, Fang Hao, Yan Jing, Akshay Kakar, Kuan-yi Lee, Yifei Li, Chaoshan Wu, Ye Zhang, Shiyang Zhao

Guest lecture for ECE 5319 (Introduction to Nanotechnology), ECE 6308 (Advanced Batteries) lab session, and ECE 6397 (Advanced Batteries: Principles, Materials, and Devices)

Media Reports

Exploring the future of aqueous batteries

(<https://techxplore.com/news/2022-12-exploring-future-aqueous-batteries.html>)

A Roadmap to Better Multivalent Batteries

(<https://uh.edu/news-events/stories/july-2020/article07172020yao-nature-energy-batteries.php>)

What Happens As Solid-State Batteries Begin To Fail? (October 10, 2019)

(<https://www.egr.uh.edu/news/201910/what-happens-solid-state-batteries-begin-fail>)

UH Engineer's Battery Research Gets New Charge With Additional DOE Funding (May 22, 2019)

(<https://www.egr.uh.edu/news/201905/uh-engineer-s-battery-research-gets-new-charge-additional-doe-fundin>)

Lean Electrolyte Design Is A Game-Changer For Magnesium Batteries (December 21, 2018)
(<https://www.egr.uh.edu/news/201812/lean-electrolyte-design-game-changer-magnesium-batteries>)

From Exploding Hoverboards To Tomorrow's Batteries: UH Engineering Team Lands On Front Cover Of Prestigious Publication (March 12, 2018)
(<https://www.egr.uh.edu/news/201803/exploding-hoverboards-tomorrows-batteries-uh-engineering-team-lands-front-cover>)

Researchers Report Breakthrough In Magnesium Batteries (August 24, 2017)
(<https://www.egr.uh.edu/news/201708/researchers-report-breakthrough-magnesium-batteries>)

Inexpensive Organic Material Gives Safe Batteries A Longer Life (June 19, 2017)
(<https://www.egr.uh.edu/news/201706/inexpensive-organic-material-gives-safe-batteries-longer-life>)

Awards and Scholarships

- 2015 Nano Research Poster Award 2015 (Silver Award), the 10th Sina-US Nano Symposium, Wuhan, China
- 2012 Excellent Graduates of NKU (awarded to the top 7% graduates)
- 2012 Sinopoly Battery Scholarship
- 2011 Yang Shi-Xian Scholarship (the highest honor a student can receive from the College of Chemistry)
- 2011 ChemComm Poster Prize, 5th ChemComm International Symposium, Nankai University, Tianjin
- 2010 Excellent Paper Award, 27th Chinese Chemical Society Congress, Xiamen
- 2008–2011 Outstanding Graduate Student Scholarship
- 2004–2007 Merit Student of Nankai University; Outstanding Student Scholarship