Jie Zhao, Ph.D.

Associate Professor,
State Key Laboratory of Molecular Engineering of Polymers, Fudan University
Overseas Outstanding Young Talents Program of China
Research areas: high-energy-density, high-safety secondary batteries · flexible electronic devices
jiezhao@fudan.edu.cn · (+86) 189-2162-1251

EDUCATION

Stanford University — Ph.D., Materials Science & Engineering **Sep 2012 – Jan 2018**
Advisor: Prof. Yi Cui (Member, U.S. National Academy of Sciences; Director of Stanford Energy Research)

Zhejiang University — B.S., Chemistry **Sep 2008 – Jun 2012**
Advisor: Prof. Jianguo Huang

University of California, Los Angeles (UCLA) — Visiting Student, Chemistry & Biochemistry **Jul 2011 – Sep 2011**
Advisor: Prof. Sarah H. Tolbert

PROFESSIONAL EXPERIENCE

Fudan University — Professor & Doctoral Supervisor **Dec 2020 – Present**
State Key Laboratory of Molecular Engineering of Polymers / College of Smart Materials and Future Energy

- Electrode materials design and cell-level engineering for high-energy-density, high-safety, secondary batteries
- Conceived and patented a class of ultra-strong, ultra-tough, ultrathin composite solid-state electrolytes
- Established the design and assembly principles for low-cost, high-energy room-temperature sodium–sulfur batteries

Northwestern University — Postdoctoral Fellow **Jan 2018 – Aug 2020**
Center for Bio-Integrated Electronics; Advisor: Prof. John A. Rogers (Member of five U.S. National Academies)

- Developed a suite of novel biodegradable encapsulation materials that govern the operational lifetimes of bioresorbable electronic systems
- Designed and demonstrated implantable, fully bioresorbable wireless electrotherapy devices with programmable functional lifetimes

Stanford University — Doctoral Researcher **Sep 2012 – Jan 2018**
Department of Materials Science & Engineering; Advisor: Prof. Yi Cui

- Pioneered the first high-capacity anode prelithiation reagents for lithium-ion batteries, protected by U.S. patents
- Engineered nanostructured architectures that markedly enhanced the structural and electrochemical stability of alloy anodes
- Elucidated the corrosion and passivation mechanisms of highly reactive electrode materials and devised conformal nanoscale protective coatings

Zhejiang University — Research Assistant **Sep 2009 – Jul 2012**
Department of Chemistry; Advisor: Prof. Jianguo Huang

- Designed bio-inspired nanomaterials as photocatalysts for the remediation of water pollution

SELECTED PUBLICATIONS

60+ peer-reviewed papers · 18,000+ citations · H-index 43. (# equal contribution; * corresponding author)

1. **J. Zhao**#, G. Zhou#, H.-M. Cheng, Y. Cui, et al. Air-stable and freestanding lithium alloy/graphene foil as an alternative to lithium metal anodes. **Nat. Nanotechnol. 12, 993 (2017).**

2. **J. Zhao**, Z. Lu, Y. Cui, et al. Dry-air-stable lithium silicide–lithium oxide core–shell nanoparticles as high-capacity prelithiation reagents. **Nat. Commun. 5, 5088 (2014).** *(U.S. DRIVE Highlights of Technical Accomplishments, 2015)*

3. **J. Zhao**#, L. Liao#, Z. Bao, Y. Cui, et al. Surface fluorination of reactive battery anode materials for enhanced stability. **J. Am. Chem. Soc. 139, 11550 (2017).**

4. C. Song, C. Zhang, Q. Yuan, Y. Gu, J. Hou*, **J. Zhao***. General prelithiation approaches and the corresponding full-cell design. **Adv. Mater. e08874 (2025).**

5. Z. Hu, **J. Zhao***, H. Guo, C. Wolverton*, Y. Huang*, J. A. Rogers*, et al. Ultrathin, transferred layers of silicon oxynitrides as tunable biofluid barriers for bioresorbable electronic systems. **Adv. Mater. 36, 2307782 (2024).**

6. X. Lei, W. Sun, Q. Zhang, J. Hou*, **J. Zhao***, et al. Unlocking room-temperature sodium–sulfur batteries through electronic tuning and structural disordering in oxygen-incorporated MoS2. **Adv. Energy Mater. (2025).** *(Cover article)*

7. J. Hou, W. Sun, Q. Yuan, L. Ding, W. Li*, **J. Zhao***, et al. Multiscale engineered bionic solid-state electrolytes breaking the stiffness–damping trade-off. **Angew. Chem. Int. Ed. e202421427 (2025).**

8. W. Sun, J. Hou*, Y. Zhou, T. Zhu, B. Jia*, G. Zhou*, **J. Zhao***, et al. Amorphous FeSnOx nanosheets with hierarchical vacancies for room-temperature sodium–sulfur batteries. **Angew. Chem. Int. Ed. 63, e202404816 (2024).** *(Cover article)*

9. T. Zhu, G. Wang, J. Hou, W. Sun, M. Chen, Y. Song*, **J. Zhao***, et al. Heterogeneous engineered solid electrolyte for seamless and stable integration of anode and cathode. **Adv. Funct. Mater. 2501870 (2025).**

10. J. Hou, T. Zhu, G. Wang, R. Cheacharoen, W. Sun, X. Lei, Q. Yuan, D. Sun*, **J. Zhao***. Composite electrolytes and interface designs for progressive solid-state sodium batteries. **Carbon Energy 6, e628 (2024).**

GRANTED PATENTS

1. Y. Cui, J. Zhao, Z. Lu. High-capacity prelithiation reagents and lithium-rich anode materials. US 20160093884A1.

2. Y. Cui, N. Liu, Z. Lu, J. Zhao. Large-volume-change lithium battery electrodes. US 20150099187A1.

3. J. Zhao, J. Hou, W. Sun. A composite solid-state electrolyte and its preparation method and application. CN 119674189 B.

4. J. Zhao, Q. Yuan. An amorphous silica two-dimensional material and its preparation method. CN 118270794 B.

TEXTBOOK

1. D. Sun, G. Huang, J. Zhao, et al. English for Materials Science and Engineering (Ministry of Education planned textbook for materials majors), 3rd author.

PROFESSIONAL SERVICE

1. Associate Editor, Frontiers in Electronics.

2. Youth Editorial Board Member: eScience, Energy Materials Advances, Journal of Energy Chemistry, SmartMat.

3. Reviewer for Nature Communications, Joule, Nano Letters, Chemical Communications, Chemistry of Materials, ACS Applied Materials & Interfaces, and Energy Storage Materials.

4. Vice President, San Francisco Section, The Electrochemical Society (ECS), 2017.

HONORS & AWARDS

1. Clarivate Highly Cited Researcher (Cross-Field), 2023 & 2024.

2. National Award for Outstanding Self-Financed Students Abroad, 2017.

3. MRS Graduate Student Award (Silver), Materials Research Society, 2017.

4. MRS Graduate Student Award — Outstanding Oral Presentation, Materials Research Society, 2017.