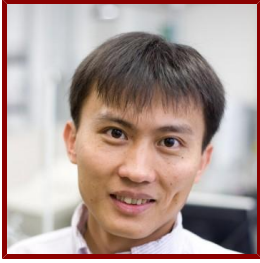


Stanford



Yi Cui

Director, Precourt Institute for Energy, Professor of Materials Science and Engineering, of Photon Science, Senior Fellow at the Precourt Institute for Energy and Professor, by courtesy, of Chemistry

CONTACT INFORMATION

- **Administrator**

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Bio

BIO

Cui studies fundamentals and applications of nanomaterials and develops tools for their understanding. Research Interests: nanotechnology, batteries, electrocatalysis, wearables, 2D materials, environmental technology (water, air, soil), cryogenic electron microscopy.

ACADEMIC APPOINTMENTS

- Professor, Materials Science and Engineering
- Professor (By courtesy), Chemistry
- Member, Bio-X
- Affiliate, Precourt Institute for Energy
- Principal Investigator, Stanford Institute for Materials and Energy Sciences
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Co-Director, Bay Area Photovoltaic Consortium, (2011-2018)
- Co-Director, Battery500 Consortium, (2016- present)
- Co-Director, Stanford StorageX Initiative, (2019- present)

HONORS AND AWARDS

- Battery Research Award, International Automotive Lithium Battery Association (2019)
- ECS Battery Technology Award, Electrochemical Society (2019)
- Nano Today Award, Nano Today Journal (2019)
- Inaugural Dan Maydan Prize for Nanoscience, The Hebrew University of Jerusalem (2019)
- ECS Fellow, Electrochemical Society (2018)
- Senior Fellow of Precourt Institute for Energy, Stanford University (2018)
- Blavatnik National Laureate in Physical Sciences and Engineering, Blavatnik Foundation (2017)

- MRS Fellow, Materials Research Society (2016)
- Blavatnik National Award Finalist, Blavatnik Foundation (2016)
- Top 10 World Changing Technology for His Invention on Cooling Textile, Scientific American (2016)
- MRS Fred Kavli Distinguished Lectureship in Nanoscience, Materials Research Society (2015)
- Fellow of Royal Society of Chemistry, Royal Society of Chemistry (2015)
- Small Young Innovator Award, Small Journal (2015)
- Resonate Award for Sustainability, California Institute of Technology (2015)
- Blavatnik National Award Finalist, Blavatnik Foundation (2015)
- Inorganic Chemistry Frontiers Award for Young Scientist, Inorganic Chemistry Frontiers (2015)
- Inaugural Schlumberger Chemistry Lectureship, University of Cambridge (2015)
- Top 10 World Changing Technology for His Invention on Batteries to Capture Low-Grade Waste Heat, Scientific American (2014)
- NO. 1 Ranked Materials Scientist Worldwide, Thomas Reuters (2014)
- Closs Lectureship, University of Chicago (2014)
- Inaugural Nano Energy Award, Nano Energy Journal (2014)
- Bau Family Awards in Inorganic Chemistry, ISCIC (2014)
- Blavatnik National Award Finalist, Blavatnik Foundation (2014)
- Distinguished Award for Novel Materials and Their Synthesis, IUPAC (2013)
- “Scientist in Residence” Lectureship, University of Duisburg-Essen (2013)
- Next Power Lectureship, National Tsing Hua University (2013)
- The Wilson Prize, Harvard University (2011)
- David Filo and Jerry Yang Faculty Scholar, Stanford University (2010-2014)
- Top 10 World Changing Technology for His Invention on Water Disinfection Nanofilters, Scientific American (2010)
- Sloan Research Fellowship, Alfred P. Sloan Foundation (2010)
- Investigator Award, KAUST (2008)
- Young Investigator Award, ONR (2008)
- Innovators Award, MDV (2008)
- Terman Fellowship, Stanford University (2008)
- Top 100 Young Innovator Award, Technology Review (2004)
- Miller Research Fellowship, Miller Institute (2003)
- Distinguished Graduate Student Award in Nanotechnology, Foresight Institute (2002)
- Graduate Student Gold Medal Award, Materials Research Society (2001)

PROFESSIONAL EDUCATION

- PhD, Harvard University (2002)

LINKS

- Cui Lab: https://web.stanford.edu/group/cui_group/
- Energy Innovation and Emerging Technologies Certificate: <https://online.stanford.edu/programs/energy-innovation-and-emerging-technologies-certificate>
- StorageX Initiative: <https://energy.stanford.edu/storagex-initiative>

Teaching

COURSES

2020-21

- Nanoscale Science, Engineering, and Technology: MATSCI 316 (Spr)
- Principles, Materials and Devices of Batteries: MATSCI 303 (Aut)

2019-20

- Nanoscale Science, Engineering, and Technology: MATSCI 316 (Spr)

2018-19

- Nanoscale Science, Engineering, and Technology: MATSCI 316 (Spr, Sum)

2017-18

- Nanoscale Science, Engineering, and Technology: MATSCI 316 (Spr, Sum)
- Principles, Materials and Devices of Batteries: MATSCI 303 (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Daniel Angell, Gan Chen, Robert Kasse, Kyuho Lee, Solomon Oyakhire

Postdoctoral Faculty Sponsor

Hao Chen, Xin Gao, Fang Liu, Jiayu Wan, Jingyang Wang, Xin Xiao, Rong Xu, Yusheng Ye, Xueli Zheng, Jiawei Zhou

Doctoral Dissertation Advisor (AC)

David Boyle, Louisa Greenburg, Sarah E Holmes, Tyler Howard, Mun Sek Kim, Sang Cheol Kim, Jun Li, Philaphon Sayavong, Rafael Vila, Hansen Wang, Yecun Wu, Jinwei Xu, Yufei Yang, Riley Zhang, Wen Zhang, Zewen Zhang

Master's Program Advisor

Matthew Chin

Doctoral Dissertation Co-Advisor (AC)

Rachel Huang, Jiachen Li

Postdoctoral Research Mentor

Hao Chen, Xin Gao, Yanbin Li, Fang Liu, Yucan Peng, Jingyang Wang, Xin Xiao, Rong Xu, Yusheng Ye

Doctoral (Program)

Norman Jin, Andrew Lee, Riley Zhang

Publications

PUBLICATIONS

- **Household Materials Selection for Homemade Cloth Face Coverings and Their Filtration Efficiency Enhancement with Triboelectric Charging.** *Nano letters*
Zhao, M., Liao, L., Xiao, W., Yu, X., Wang, H., Wang, Q., Lin, Y. L., Kilinc-Balci, F. S., Price, A., Chu, L., Chu, M. C., Chu, S., Cui, et al
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- **Incorporating the nanoscale encapsulation concept from liquid electrolytes into solid-state lithium-sulfur batteries.** *Nano letters*
Gao, X., Zheng, X., Wang, J., Zhang, Z., Xiao, X., Wan, J., Ye, Y., Chou, L., Lee, H. K., Wang, J., Vila, R. A., Yang, Y., Zhang, et al

2020

- **Stretchable electrochemical energy storage devices.** *Chemical Society reviews*
Mackanic, D. G., Chang, T., Huang, Z., Cui, Y., Bao, Z.
2020
- **Electrode roughness dependent electrodeposition of sodium at the nanoscale** *NANO ENERGY*
Zeng, Z., Barai, P., Lee, S., Yang, J., Zhang, X., Zheng, W., Liu, Y., Bustillo, K. C., Ercius, P., Guo, J., Cui, Y., Srinivasan, V., Zheng, et al
2020; 72
- **An approaching-theoretical-capacity anode material for aqueous battery: Hollow hexagonal prism Bi₂O₃ assembled by nanoparticles** *ENERGY STORAGE MATERIALS*
Zan, G., Wu, T., Hu, P., Zhou, Y., Zhao, S., Xu, S., Chen, J., Cui, Y., Wu, Q.
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- **Can N95 Respirators Be Reused after Disinfection? How Many Times?** *ACS nano*
Liao, L., Xiao, W., Zhao, M., Yu, X., Wang, H., Wang, Q., Chu, S., Cui, Y.
2020
- **Electrolytes for micro-sized silicon** *NATURE ENERGY*
Wang, J., Cui, Y.
2020
- **A High-Rate Lithium Manganese Oxide-Hydrogen Battery.** *Nano letters*
Zhu, Z., Wang, M., Meng, Y., Lin, Z., Cui, Y., Chen, W.
2020
- **Advanced Textiles for Personal Thermal Management and Energy** *JOULE*
Peng, Y., Cui, Y.
2020; 4 (4): 724–42
- **Tortuosity Effects in Lithium-Metal Host Anodes** *JOULE*
Chen, H., Pei, A., Wan, J., Lin, D., Vila, R., Wang, H., Mackanic, D., Steinruck, H., Huang, W., Li, Y., Yang, A., Xie, J., Wu, et al
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- **Improving Lithium Metal Composite Anodes with Seeding and Pillaring Effects of Silicon Nanoparticles.** *ACS nano*
Wang, H., Cao, X., Gu, H., Liu, Y., Li, Y., Zhang, Z., Huang, W., Wang, H., Wang, J., Xu, W., Zhang, J., Cui, Y.
2020
- **A New Class of Ionically Conducting Fluorinated Ether Electrolytes with High Electrochemical Stability.** *Journal of the American Chemical Society*
Amanchukwu, C. V., Yu, Z., Kong, X., Qin, J., Cui, Y., Bao, Z.
2020
- **Resolving Nanoscopic and Mesoscopic Heterogeneity of Fluorinated Species in Battery Solid-Electrolyte Interphases by Cryogenic Electron Microscopy** *ACS ENERGY LETTERS*
Huang, W., Wang, H., Boyle, D. T., Li, Y., Cui, Y.
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- **Scalable synthesis of nanoporous silicon microparticles for highly cyclable lithium-ion batteries** *NANO RESEARCH*
Wang, J., Huang, W., Kim, Y., Jeong, Y., Kim, S., Heo, J., Lee, H., Liu, B., Nah, J., Cui, Y.
2020
- **Aspects of the synthesis of thin film superconducting infinite-layer nickelates** *APL MATERIALS*
Lee, K., Goodge, B. H., Li, D., Osada, M., Wang, B., Cui, Y., Kourkoutis, L. F., Hwang, H. Y.
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Weng, Y., Wang, H., Lee, R., Huang, C., Huang, S., Abdollahifar, M., Kuo, L., Hwang, B., Kuo, C., Cui, Y., Wu, N.
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2020
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Li, G., Chen, W., Zhang, H., Gong, Y., Shi, F., Wang, J., Zhang, R., Chen, G., Jin, Y., Wu, T., Tang, Z., Cui, Y.
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- **Robust ultraclean atomically thin membranes for atomic-resolution electron microscopy.** *Nature communications*
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- **Synergistic enhancement of electrocatalytic CO₂ reduction to C₂ oxygenates at nitrogen-doped nanodiamonds/Cu interface.** *Nature nanotechnology*
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- **Electrochemical generation of liquid and solid sulfur on two-dimensional layered materials with distinct areal capacities** *Nature Nanotechnology*
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- **Electrotunable liquid sulfur microdroplets.** *Nature communications*
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- **A Single-Ion Conducting Borate Network Polymer as a Viable Quasi-Solid Electrolyte for Lithium Metal Batteries.** *Advanced materials (Deerfield Beach, Fla.)*
Shin, D. M., Bachman, J. E., Taylor, M. K., Kamcev, J. n., Park, J. G., Ziebel, M. E., Velasquez, E. n., Jarenwattananon, N. N., Sethi, G. K., Cui, Y. n., Long, J. R.
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- **Electrochemical generation of liquid and solid sulfur on two-dimensional layered materials with distinct areal capacities.** *Nature nanotechnology*
Yang, A. n., Zhou, G. n., Kong, X. n., Vilá, R. A., Pei, A. n., Wu, Y. n., Yu, X. n., Zheng, X. n., Wu, C. L., Liu, B. n., Chen, H. n., Xu, Y. n., Chen, et al
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- **An ultrathin ionomer interphase for high efficiency lithium anode in carbonate based electrolyte.** *Nature communications*
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- **A Water Stable, Near-Zero-Strain O3-Layered Titanium-Based Anode for Long Cycle Sodium-Ion Battery** *ADVANCED FUNCTIONAL MATERIALS*
Cao, Y., Zhang, Q., Wei, Y., Guo, Y., Zhang, Z., Huang, W., Yang, K., Chen, W., Zhai, T., Li, H., Cui, Y.
2019
- **Artificial Solid Electrolyte Interphase for Suppressing Surface Reactions and Cathode Dissolution in Aqueous Zinc Ion Batteries** *ACS ENERGY LETTERS*
Guo, J., Ming, J., Lei, Y., Zhang, W., Xia, C., Cui, Y., Alshareef, H. N.
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- **Improved Oxygen Reduction Reaction Activity of Nanostructured CoS₂ through Electrochemical Tuning** *ACS APPLIED ENERGY MATERIALS*
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- **Decoupling of mechanical properties and ionic conductivity in supramolecular lithium ion conductors.** *Nature communications*
Mackanic, D. G., Yan, X., Zhang, Q., Matsuhisa, N., Yu, Z., Jiang, Y., Manika, T., Lopez, J., Yan, H., Liu, K., Chen, X., Cui, Y., Bao, et al
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- **Unravelling Degradation Mechanisms and Atomic Structure of Organic-Inorganic Halide Perovskites by Cryo-EM** *JOULE*
Li, Y., Zhou, W., Li, Y., Huang, W., Zhang, Z., Chen, G., Wang, H., Wu, G., Rolston, N., Vila, R., Chiu, W., Cui, Y.
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- **A Dynamic, Electrolyte-Blocking, and Single-Ion-Conductive Network for Stable Lithium-Metal Anodes** *JOULE*
Yu, Z., Mackanic, D. G., Michaels, W., Lee, M., Pei, A., Feng, D., Zhang, Q., Tsao, Y., Amanchukwu, C., Yan, X., Wang, H., Chen, S., Liu, et al
2019; 3 (11): 2761–76
- **Minimized lithium trapping by isovalent isomorphism for high initial Coulombic efficiency of silicon anodes.** *Science advances*
Zhu, B., Liu, G., Lv, G., Mu, Y., Zhao, Y., Wang, Y., Li, X., Yao, P., Deng, Y., Cui, Y., Zhu, J.
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- **Two-dimensional inorganic molecular crystals.** *Nature communications*
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- **Nonpolar Alkanes Modify Lithium-Ion Solvation for Improved Lithium Deposition and Stripping** *ADVANCED ENERGY MATERIALS*
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2019

- **Design of Hollow Nanostructures for Energy Storage, Conversion and Production** *ADVANCED MATERIALS*
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- **Monolithic solid-electrolyte interphases formed in fluorinated orthoformate-based electrolytes minimize Li depletion and pulverization** *NATURE ENERGY*
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- **Preventing Li depletion and pulverization by monolithic SEI layer generated in fluorinated orthoformate based electrolytes**
Cao, X., Ren, X., Zou, L., Engelhard, M., Huang, W., Wang, H., Matthews, B., Lee, H., Niu, C., Arey, B., Cui, Y., Wang, C., Xiao, et al
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- **Intrinsically flexible redox-active polyurethanes for electrochemical energy storage**
Mackanic, D., Cui, Y., Bao, Z.
AMER CHEMICAL SOC.2019
- **Scalable and facile preparation of SSNs for lithium metal stabilization**
Mackanic, D., Yu, Z., Cui, Y., Bao, Z.
AMER CHEMICAL SOC.2019
- **Understanding and redesigning metallic lithium for next-generation batteries**
Liu, Y., Lin, D., Lin, Y., Chen, G., Pei, A., Lie, Y., Cui, Y.
AMER CHEMICAL SOC.2019
- **Dynamic single-ion-conductive network as a stable lithium metal artificial solid electrolyte interphase in carbonate electrolyte**
Mackanic, D., Yu, Z., Cui, Y., Bao, Z.
AMER CHEMICAL SOC.2019
- **Decoupling of mechanical properties and ionic conductivity in supramolecular stretchable battery materials**
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AMER CHEMICAL SOC.2019
- **Self-Selective Catalyst Synthesis for CO₂ Reduction** *JOULE*
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Li, Y., Wang, K., Zhou, W., Li, Y., Vila, R., Huang, W., Wang, H., Chen, G., Wu, G., Tsao, Y., Wang, H., Sinclair, R., Chiu, et al
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Wang, J., Huang, W., Pei, A., Li, Y., Shi, F., Yu, X., Cui, Y.
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- **Superconductivity in an infinite-layer nickelate.** *Nature*
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- **Challenges and opportunities towards fast-charging battery materials** *NATURE ENERGY*
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- **An Autotransferable g-C₃N₄ Li⁺-Modulating Layer toward Stable Lithium Anodes** *ADVANCED MATERIALS*
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- **Surface-engineered mesoporous silicon microparticles as high-Coulombic-efficiency anodes for lithium-ion batteries** *NANO ENERGY*
Wang, J., Liao, L., Lee, H., Shi, F., Huang, W., Zhao, J., Pei, A., Tang, J., Zheng, X., Chen, W., Cui, Y.
2019; 61: 404–10

- **Temperature Regulation in Colored Infrared-Transparent Polyethylene Textiles** *JOULE*
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- **Uniform High Ionic Conducting Lithium Sulfide Protection Layer for Stable Lithium Metal Anode** *ADVANCED ENERGY MATERIALS*
Chen, H., Pei, A., Lin, D., Xie, J., Yang, A., Xu, J., Lin, K., Wang, J., Wang, H., Shi, F., Boyle, D., Cui, Y.
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2019
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Liu, C., Wu, T., Hsu, P., Xie, J., Zhao, J., Liu, K., Sun, J., Xu, J., Tang, J., Ye, Z., Lin, D., Cui, Y.
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Xu, Y., Ye, Y., Zhao, S., Feng, J., Li, J., Chen, H., Yang, A., Shi, F., Jia, L., Wu, Y., Yu, X., Glans-Suzuki, P., Cui, et al
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Sun, Y., Wang, L., Li, Y., Li, Y., Lee, H., Pei, A., He, X., Cui, Y.
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