

Society Announces 2024-2025 ECS Toyota Young Investigator Fellowship Recipients

Pennington, NJ – **Zheng Chen, Zhongyang Wang, and Juner Zhu** received the 2024–2025 [ECS Toyota Young Investigator Fellowships](#) for projects in green energy technology. The fellowship program is a partnership between The Electrochemical Society and the [Toyota Research Institute of North America](#) (TRINA), a Toyota Motor North America (Toyota) R&D division that explores future technology. Through this program, ECS and Toyota promote innovative and unconventional green energy technologies born from electrochemical research and encourage young professionals and scholars to pursue battery and fuel cell research. The Fellows each receive a \$50,000 grant to conduct the research outlined in their proposals and a one-year complimentary ECS membership.

This is the tenth year that the fellowships have been awarded. Since its inception, the program has awarded more than \$1.65M in research funding to 33 young investigators (including the 2024–2025 recipients).

2024–2025 ECS Toyota Young Investigator Fellows

Zheng Chen

University of California, San Diego

“For Enabling Greener and More Sustainable Materials for Electrochemical Energy Storage and Conversion”

[Zheng Chen](#) is Professor of Chemical and NanoEngineering, at the University of California, San Diego. His research focuses on materials development for applications in electrochemical energy, flexible devices, and a sustainable environment. Through the ECS Toyota Young Investigator Fellowship, Dr. Chen will address water soluble binders offering potentially high value gain in cathode processing and addressing key concerns of anticipated PFAS-free material regulation. He will provide a realistic approach to investigation CO₂ conversion mechanism and performance while addressing two key aspects of conversion: catalyst identity and CO₂ binding.

Dr. Chen completed a PhD at the University of California, Los Angeles in 2012 under the supervision of Prof. Yunfeng Lu in the Department of Chemical and Biomolecular Engineering. His PhD work related mainly to the design and synthesis of nanostructured materials for electrochemical energy storage devices. From 2013-2016, he was a postdoctoral associate working with Prof. Zhenan Bao and Prof. Yi Cui at Stanford University, focusing on functional polymer materials for enhanced energy density, longer cycling lifetime, and improved safety of batteries.

Dr. Chen received his BS in Chemical Engineering from Tianjin University which gave him their 2007 Talented Science Student Award. His work has been recognized with the 2023 ECS Battery Division Early Career Award; 2018 NASA Early Career Faculty Award; 2018 ACS PRF Doctoral New Investigator Award; 2017 LG Chem BIC Award; 2012 UCLA Department Outstanding Graduate Award; 2011 MRS Graduate Student Silver Award; and 2011 Chinese Government Award for Outstanding Self-Financed PhD Students Studying Abroad. He was named “Emerging Investigator” by *Nanoscale* (2021), *Chemical Communication* (2020), and *Journal of Materials Chemistry C* (2018). The organizer and chair of ECS meeting symposia, he has seven patents, is an associate editor of *Battery Energy*, and author of three book chapters and 135 articles with an h-index is 58.

Zhongyang Wang

The University of Alabama

“Synthesis and Assessment of Hydrocarbon-Based Proton Exchange Materials for Enhancing Fuel Cell Technology”

[Zhongyang Wang](#) is an Assistant Professor at The University of Alabama (UA). His research contributions include the investigation and deployment of bipolar membranes to advance the development of liquid-liquid fuel cells; and understanding mixed ionic/electronic transport in conjugated polyelectrolytes for renewable energy applications. Through the ECS Toyota Young Investigator Fellowship, Dr. Wang will advance the development of fuel cell technology by addressing the precision synthesis of fully saturated hydrocarbon-based proton exchange membranes to replace long-standing Nafion ionomers.

Dr. Wang completed his PhD in Energy, Environmental, and Chemical Engineering at Washington University in St. Louis in 2019 with advisor Vijay Ramani, followed by a postdoc co-advised by Paul Nealey and Shrayesh Patel at the University of Chicago. His research has been recognized by the 2024 Hewson Faculty Fellowship of the Hewson Family Foundation and UA; 2022 Maria Lastra Excellence in Mentoring Award for Postdoctoral Researchers from UChicago; 2020 ECS Industrial Electrochemistry and Electrochemical Engineering Division H. H. Dow Memorial Student Achievement Award; and 2020 Annual Research Impact Award from WashU. The author of 23 articles with an h-index of 17, he has three active and two pending U.S. patents.

Juner Zhu

Northeastern University

“Mechano-Electrochemical Assessment of Spent Batteries for End-of-Life Decision-Making”

[Juner Zhu](#) is Assistant Professor at Northeastern University (NU). The Zhu Group has two labs at NU, the Battery Sustainability Lab, and Electro-Chemo-Mechanics Lab. His research contributions include safety-focused testing methods and models for EV batteries; multi-scale electro-chemo-mechanical characterization of battery materials and cells; and scientific machine learning algorithms for battery materials and systems. Through the ECS Toyota Young Investigator Fellowship, Dr. Zhu will investigate non-destructive techniques to identify common degradation modes in commercial Li-ion cells, presenting a quick and safe approach to EoL cell defect identification, while also building a predictive ML library for future application.

Before joining the NU faculty of Mechanical and Industrial Engineering in August 2022, Dr. Zhu was a Research Scientist working jointly in the Departments of Mechanical Engineering and Chemical Engineering at the Massachusetts Institute of Technology (MIT). With Prof. Tomasz Wierzbicki as supervisor, he completed his PhD in Mechanical Engineering at MIT (2019) where he was a postdoc (2019-2021) and Research Scientist (2021-2022) under Prof. Wierzbick and Prof. Martin Z. Bazant.

Dr. Zhu is the author of 43 journal articles with an h-index of 27. He co-developed the 2020-2022 phase of the MIT Industrial Battery Consortium, acting as Executive Director working with eight world-leading companies in the areas of EV, battery, and consumer electronics. Dr. Zhu also worked as a materials engineer at Ford Motor Company and battery analyst at Apple.

Dr. Zhu graduated with a BS and MS from Tsinghua University, receiving the 2015 Top Grade Fellowship, the highest honor for graduate students. He received the 2022 Haythornthwaite Foundation Research Initiation Grant by the Applied Mechanics Division (AMD) of the American Society of Mechanical Engineering (ASME). Dr. Zhu co-founded the Center for Battery Sustainability, a Northeastern and MIT joint research program with industry support in 2022, and in 2023, BattSafe Solutions LLC where he is Chief Scientist.

2024–2025 ECS Toyota Young Investigators Fellowships

Fellows receive a \$50,000 grant and one-year complimentary ECS membership. They are required to submit a midway progress report to ECS and, after one year of funding, a final written report. Their findings are published open access in a relevant ECS journal, and within 24 months of the end of the research period, they deliver a presentation at an ECS meeting. TRINA invites the Fellows to present their research progress semiannually. After their fellowships end, Toyota may choose to enter into research agreements and continue collaborating with the Fellows.

2024–2025 ECS Toyota Young Investigators Fellowship Selection Committee

ECS gratefully acknowledges the service of the following ECS Toyota Young Investigator Fellowship Selection Committee members who reviewed more than 160 proposals for the 2024–2025 program.

Toyota Research Institute of North America (TRINA)

- Timothy (Tim) Arthur, *Senior Manager, Research Strategy Office, TRINA*
- Masato Hozumi, *Executive Engineer and Senior Manager, Materials Research Department, TRINA*
- Charles (Chip) Roberts, *Senior Research Manager, Materials Research Department, TRINA*
- Gaohua Zhu, *Senior Scientist, Materials Research Department, TRINA*
- Liang Wang, *Senior Scientist, Materials Research Department, TRINA*
- Rana Mohtadi, *Senior Principal Scientist, Materials Research Department, TRINA*
- Nik Singh, *Senior Scientist, Materials Research Department, TRINA*
- Chen Ling, *Senior Principal Scientist, Materials Research Department, TRINA*
- John Muldoon, *Senior Principal Scientist, Materials Research Department, TRINA*

The Electrochemical Society

- Amy Prieto, *Professor, Colorado State University*
- Joaquín Rodríguez-López, *J. Andrew and Susan S. Langan Professorial Scholar, LAS Distinguished Professorial Scholar and Professor of Chemistry, University of Illinois Urbana-Champaign*
- John T. Vaughey, *Senior Scientist, Argonne National Laboratory*

2025-2026 fellowship cycle

The next ECS Toyota Fellowship cycle request for proposals opens in November 2024 with a submission deadline of January 31, 2025. Candidate interviews are scheduled for spring 2025 and Fellows' names are announced in August 2025.

Consult the [ECS website](#) for more information and to submit a proposal.

The Electrochemical Society (ECS)

The nonprofit professional [Electrochemical Society](#) has led the world in electrochemistry and solid state science and technology and allied subjects since 1902. We advance scientific theory and practice through publications, meetings, continuing education, and collaboration. Our robust global membership develops solutions to the planet's major challenges. Scientists, engineers, and industry leaders share research at ECS biannual, co-hosted, and sponsored meetings. The ECS Digital Library on IOPscience hosts abstracts and highly peer-reviewed articles from publications, including the *Journal of The Electrochemical Society* (the oldest journal in its field), *ECS Journal of Solid State Science and Technology*, and Gold Open Access journals *ECS Sensors Plus* and *ECS Advances*.

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