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ECS Case Western Reserve University Student Chapter

Electrifying Excellence: The Chapter's Journey

Electrochemistry is a cornerstone of scientific exploration and innovation at Case Western Reserve University (CWRU). CWRU has a rich history in electrochemistry and electrochemical engineering, disciplines initiated through Professor **Ernest B. Yeager's** leadership. CWRU's dedication to excellence in this field is evident through its robust community of researchers, scholars, and students who continuously push the boundaries of knowledge and discovery. From fundamental studies of electrode processes to developing novel electrochemical devices and materials, electrochemists and electrochemical engineers at CWRU tackle diverse challenges creatively and rigorously. A vibrant and supportive community fostering collaboration, mentorship, and knowledge exchange, driving the collective pursuit of scientific excellence forward, is central to CWRU's success in electrochemistry.

A once-vibrant ECS Case Western Reserve University Student Chapter struggled over recent years as the electrochemical industry around Northeast Ohio changed and the COVID-19 pandemic forced the chapter into inactivity. One year ago, a dedicated executive committee—comprising President **Oğuz Kağan Coşkun**, Vice President **Desiree Mae Prado**, Secretary **Saurabh Pathak**, Treasurer **Zeynep Bagbudar**, Social Media Liaison **Yuanman Ma**, and Faculty Advisor Prof. **Robert Savinell**—reestablished the chapter and launched it on a journey to revitalize its presence and impact within the university's electrochemistry community.

The revived chapter quickly gained momentum, in a short time attracting over 25 members, including postdocs, graduate students, and undergraduates. With a renewed sense of purpose, plans were made to fulfill ECS's mission to advance theory and practice at the forefront of electrochemical and solid state science and technology and allied subjects—a mission that aligns perfectly with CWRU's commitment to research excellence and innovation. The chapter embarked on various initiatives to promote research, foster discussion, encourage critical assessment, and disseminate knowledge in the electrochemistry field. Seminars and workshops were organized to engage members and the broader community in meaningful discussions and collaborations.

Throughout the year, these educational opportunities provided chapter members with valuable insights into various aspects of electrochemistry. The inaugural electrochemistry gathering on

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The ECS Case Western Reserve University Student Chapter organized numerous activities during the academic term. a) CWRU's Prof. **Jesse Wainright** *discusses electrochemical impedance spectroscopy. b) Dr.* **Alex Peroff** *from Pine Research elucidates the functionality of potentiostats. c) Chapter executive committee members engage with Dr.* **Zhimin Zhong** *from NASA over lunch. d) Student chapter members host Prof.* **Hubert Gasteiger**, *Technische Universität München (back row, third from the left), and Prof.* **Gessie Brisard**, *Université de Sherbrooke (back row, fifth from the left), during the CRWU Eltech Lecture Series.*

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September 21, 2023 featured CWRU Professors **Rohan Akolkar** and Dr. **Nicholas Sinclair** reporting on reference electrodes and electrode kinetics. On November 20, 2023, Prof. **Jesse Wainright** (CWRU) delivered a comprehensive session on electrochemical impedance spectroscopy, offering participants a deeper understanding of this powerful analytical technique. Dr. **Zhimin Zhong** from NASA shared insights on electroplating and PEM fuel cells on January 25, 2024, shedding light on cutting-edge developments in these fields. On February 15, Dr. **Alex Peroff** from Pine Research elucidated the inner workings of potentiostats, providing attendees with a clearer understanding of this essential electrochemical instrument. On February 27, the chapter was honored to host two distinguished guests, Prof. **Hubert Gasteiger** from the Technische Universität München (who delivered two insightful Eltech Series Lectures during his visit to CWRU) and Prof. **Gessie Brisard** from Université de Sherbrooke. On March 22, Prof. **Daniel Scherson** (CWRU) engaged participants in an intriguing discussion on bioelectrochemistry, exploring the innovative concept of utilizing enzymatic fuel cells to harness the sugar in an insect's blood and power electronics to deliver commands to these cyborg insects.

Additional engaging and informative sessions include two Interface Sessions led by CRWU professors **Robert Warburton** and **Burcu Gurkan** on crucial aspects of interfacial simulation by fundamental approaches and developing interfacial models to describe the electrode-electrode interface in complex electrolytes, respectively. The semester culminated with a lecture by Prof. Rohan Akolkar on cyclic voltammetry simulations, offering members a practical insight into this essential electrochemical technique. These ongoing seminars and workshops continue to foster a vibrant community of electrochemistry enthusiasts, enriching its members' academic and professional experiences.

Looking ahead, the chapter aspires to be recognized as vibrant, engaged, and contributing to advancements that positively impact society and the electrochemical community. Our members were stimulated by attending and presenting their research results at the 245th ECS Meeting and look forward to PRiME in Hawaii. Our dedicated leadership, enthusiastic membership, and supportive faculty have electrified the revived chapter and will propel us into an impactful future.

Contributed by **Oğuz Kağan Coşkun**, **Desiree Mae Prado**, **Saurabh Pathak**, **Zeynep Bagbudar**, **Yuanman Ma**, *and* **Robert Savinell**.

ECS Central Electrochemical Research Institute Student Chapter

ECS recently chartered a student chapter at the Council of Scientific and Industrial Research-Central Electrochemical Research Institute (CSIR-CECRI). Dr. **S. A. Ilangovan**, the Former Deputy Director of the Vikram Sarabhai Space Centre (VSSC) inaugurated the chapter on February 28, 2024, unveiling the chapter's logo and website, and delivering the inaugural lecture, "Powering the Batteries: A Promising Approach." His illuminating lecture discussed current challenges in advancing battery technology, especially the technical difficulties of engineering batteries and supercapatteries for futuristic applications requiring high power and high energy. Participants' active interaction with the speaker reflected their curiosity and enthusiasm about electrochemistry. In his presidential address, Dr. **K. Ramesha**, Director, CSIR-CECRI, thanked ECS for this interesting initiative, which will serve as a launching pad for students' many inspiring and innovative ideas. The chapter's faculty advisor, Dr. **N. Lakshminarasimhan**, Senior Principal Scientist, CSIR-CECRI, informed the gathering about ECS's mission and the chapter's future plans. The event, which attracted about 150 participants, will serve as a catalyst for future endeavors, providing a platform for learning, collaboration, and growth within the electrochemical community.



Dr. **S. A. Ilangovan**, *Former Deputy Director, Vikram Sarabhai Space Centre, inaugurated the recently chartered ECS Central Electrochemical Research Institute Student Chapter.*



Students and professors gather for the inauguration of the ECS Central Electrochemical Research Institute Student Chapter.

ECS Indian Institute of Technology Madras Student Chapter

The ECS Indian Institute of Technology Madras Student Chapter organized a week-long, hands-on training session from January 12 to 17 featuring distinguished solid state chemist Prof. **Werner Paulus** of the Institut Charles Gerhardt, Université de Montpellier. This part of our lecture series was restricted to a limited number of participants and provided a comprehensive one-on-one learning experience on structure analysis and the application of solid state chemistry in electrochemistry.

To broaden the horizons of electrochemistry education beyond our local community, the chapter collaborated with the National Institute of Technology Tiruchirappalli (NITT) to host the "Electrochemical Characterization of Batteries" workshop on January 22–23. This event attracted more than 100 participants from the region. A hands-on session, followed by a quiz based on the hands-on topics, complemented lectures by esteemed faculty members from the Indian Institute of Technology Madras (IITM), Prof. **Kothandaraman R** and Prof. **Ramanathan S**, and from NITT, Prof. **R. Karvembu**, Prof. **L. Cindrella**, and Dr. **Sunandan Sarkar**.

The chapter and IITM Energy Consortium co-hosted a two-day symposium titled "Symposium and Hands-on on Batteries," honoring the remarkable contributions to electrochemistry of Prof.

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At their Atria University-Bengaluru "Battery Characterization Techniques" workshop, chapter members present a hands-on demonstration of assembling a DIY Redox battery kit and conducting galvanostatic charge-discharge.



The ECS Indian Institute of Technology Madras Student Chapter collaborated with the National Institute of Technology Tiruchirappalli (NITT) to host the "Electrochemical Characterization of Batteries" workshop.



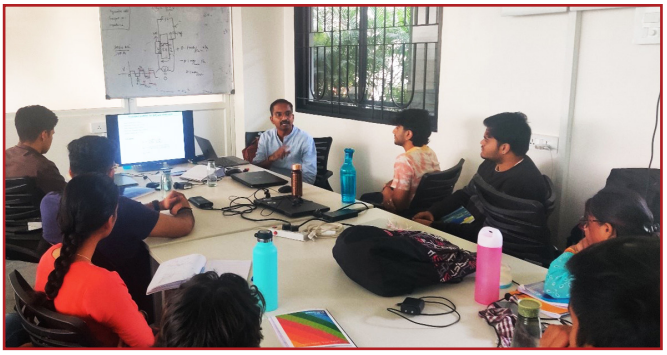
ECS Indian Institute of Technology Madras Student Chapter committee members co-organized a two-day "Symposium and Hands-on on Batteries" with the IITM Energy Consortium.

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A. K. Shukla of the Indian Institute of Science, Bengaluru. Prof. Shukla is a Fellow of The Electrochemistry Society and former editor of the *Journal of The Electrochemical Society*. The event was a blend of insightful talks by luminary professors Shukla, **Werner Weppner** (Christian-Albrechts-Universität zu Kiel), and **Venkataraman Thangadurai** (University of Calgary), and 10 invited speakers. A hands-on session took place on the second day. To encourage trying different redox systems and to ignite a passion for electrochemistry, all participants received redox battery kits and were taught how to assemble them independently. The event was sponsored in part by **Renault Nissan Technology & Business Centre India** and **IITM Pravartak**.

The chapter was invited to conduct a three-day "Battery Characterization Techniques" workshop at Atria University-Bengaluru. This workshop, the chapter's second initiative outside IITM in Chenai, provided an end-to-end understanding of electrode making and battery fabrication. From preparing the slurry to mastering cell performance evaluation techniques, participants were meticulously guided through each step of the process.

In July, the chapter ran a one-week summer school program at the Vellore Institute of Technology-Vellore. A special lecture by Prof. **Archita Patnaik** is scheduled for Teacher's Day on September 5, 2024.



IITM Prof. **Kothandaraman R** *explains the transport number calculation in polymer electrolytes to Atria University students.*

ECS Massachusetts Institute of Technology Student Chapter

The ECS Massachusetts Institute of Technology (MIT) Student Chapter is thrilled to announce the addition of new members to our executive committee. The chapter is led by **Katelyn Ripley** and **Trent Weiss**, Co-Chairs; **Yash Samantaray**, Treasurer; **Lia Bu**, Secretary; **Katherine Steinberg**, Secretary; and **Ethan Benderly-Kremen**, **Nicholas Matteucci**, **Anish Sukumar**, **Cindy Wong**, and **Siqi Wu**, Event Planners. Committee members are associated with a variety of departments across MIT, including Chemical Engineering, Materials Science and Engineering, and Mechanical Engineering.

The chapter successfully hosted various events, including student mixers, a joint summer barbeque with the ECS Harvard University Student Chapter, many speaker sessions, and industry/start-up panels with local industry representatives. The group hosted Dr. **Jerome Babauta** from Gamry Instruments in April for an event covering potentiostat operation, experimental troubleshooting, and a demonstration on assembling, troubleshooting, and operating an aqueous electrochemical cell. Other speakers included, from MIT, professors **Martin Bazant**, **Yogesh Surendranath**, and **Ju Li**; from Stanford University, Prof. **William Tarpeh**; and from Harvard, Prof. **Zachary Schiffer**.

In the coming academic year, the chapter looks forward to hosting more seminar speakers and electrochemistry experts sharing their most recent and upcoming work in the field of electrochemistry!



The ECS Massachusetts Institute of Technology Student Chapter hosted a speaker seminar featuring Prof. **Zachary Schiffer**, *Harvard University.*
Photo: Nicholas Matteucci

ECS Munich Student Chapter

ECS Munich Student Chapter members and 20 students visited Varta Microbattery GmbH this past spring. In a series of exciting talks, the company provided insights into its R&D activities and the industrialization of micro batteries. The visit concluded with a guided tour of the production line for high-power batteries in cylindrical and coin cell format, from the mixing of the slurry overcoating, calendering, electrode cutting, coil winding, and electrolyte filling up, to the formation of batteries.

In March, the chapter hosted a continuation of its lecture series. Invited speakers Prof. **Yang Shao-Horn** (Massachusetts Institute of Technology) and Prof. **Jeff Dahn** (Dalhousie University) gave exciting talks about their research in the fields of energy materials and batteries, then answered participating students' numerous questions. The event, which



The ECS Munich Student Chapter Lecture Series features Prof. **Yang Shao-Horn** (Massachusetts Institute of Technoloy, bottom) and Prof. **Jeff Dahn** (Dalhousie University, top).

attracted around 60 people, was open to all interested Technische Universität München students, including undergraduates, graduate and PhD students, postdocs, and professors.

Further 2024 chapter plans include visiting the BMW Group battery pilot line and hosting a conference to connect students and university chairs working in electrochemistry in the Munich area.



ECS Munich Student Chapter members visit Varta Microbattery GmbH.

ECS Texas Tech University Student Chapter

With the kickoff of the spring semester, the ECS Texas Tech University Student Chapter arranged an engaging inaugural meeting where we celebrated the start of a new term, shared ideas, and set goals and plans for the months ahead. Each member had the opportunity to voice their thoughts and contribute to our plan, ensuring the agenda was dynamic and diverse.

In the spirit of diversity and equity, the chapter also conducted its officer selection meeting. The chapter demonstrated its dedication to involving younger students and incorporating their viewpoints by electing an undergraduate member to represent undergrads. This new addition to the chapter will help connect the chapter to the Society's goals and newer generations.

Beyond its regular activities, the chapter emphasizes cultivating professional and academic relationships. Upholding this commitment, we successfully organized a trio of webinars, fostering a rich exchange of ideas and igniting lively discussions. In the first webinar, Prof. **Miguel A. Modestino** from New York University presented "Engineering Electrochemical Reactions for Sustainable Chemical Manufacturing," seamlessly tying academic theory to practicalities for sustainable solutions. Prof. **Karthish Manthiram** from the California Institute of Technology explored the vital topic of "Electrification and Decarbonization of Chemical Synthesis" in the second webinar. **Chris Starr** from Metrohm USA presented "The Interdisciplinary Future of Electrochemistry—The Experimental" in the third webinar. His talk provided a compelling look into the experimental and commercial potentials of electrochemistry.

Moving forward, the ECS Texas Tech University Student Chapter aims to deepen engagements with leading experts, do more webinar series, organize further seminar series, and establish connections with other ECS Student Chapters. In the coming academic year, the chapter looks forward to hosting more seminar speakers and electrochemistry experts sharing their most recent and upcoming work in the field of electrochemistry!



The ECS Texas Tech University Student Chapter is delighted to introduce their new undergraduate representative. Pictured (from left to right:) Vice President **Zenifar Haque**, *President* **Nathan Wilson**, *Secretary* **Jessica Ortega**, *Treasurer* **Dipu Saha**, *and newly recruited Undergrad Officer,* **Archer Montgomery**.



Chris Starr, **Karthish Manthiram**, *and* **Miguel Modestino** *present three engaging talks in the spring ECS Texas Tech Student Chapter webinar series.*

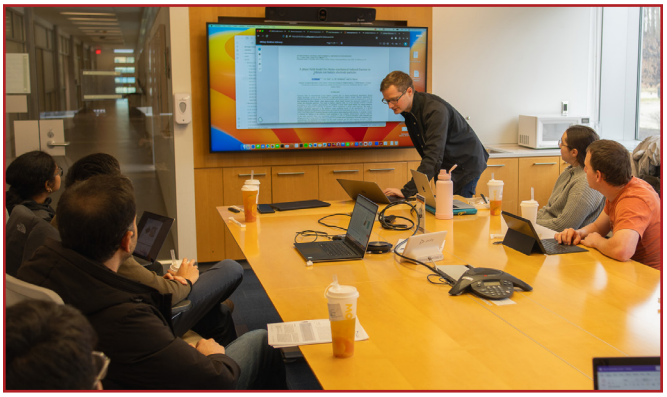
ECS University of Michigan Student Chapter

The ECS University of Michigan Student Chapter welcomes the newly appointed External Relations Chair **Christopher Woodley**, Publicity Chair **Davy Zeng**, Outreach Chair **Hongyi Lin**, and new Faculty Mentor Assistant Professor **Joshua Jack**! With the help of its new executive committee members, the chapter had an eventful start to the year.

The chapter hosted four invited speakers. First was Dr. **Stephen J. Harris**, Scientific Engineering Associate at Lawrence Berkeley National Laboratory, who gave an informative talk on "Statistical and Machine Learning-Based Durability Testing Strategies for Energy" and provided further insight on industry vs. academic career paths. Principal Engineer at Mercedes-Benz Research & Development North America and Vice Chair of the ECS Detroit Section **Tobias Glossmann** presented "Advanced Batteries Technologies—Opportunities Revisited" on the future possibilities and challenges for battery usage in electric powertrains, from fast charging to battery manufacturing. Dr. **Owen (Zijie) Lu**, Research Engineer for Cell Technology at Ford Motor Company, delivered an exciting lecture on the future of sulfide-based solid state batteries titled "Challenges and Opportunities in Developing Sulfide-Based Solid-State Batteries for Electric Vehicle Application."



Research Engineer for Cell Technology at Ford Motor Company Dr. **Owen (Zijie) Lu** *presents "Challenges and Opportunities in Developing Sulfide-Based Solid-State Batteries for Electric Vehicle Application."*
Photo: Jinhong Min



The ECS University of Michigan Student Chapter Treasurer, **Jinhong Min**, *hosts a Journal Club meeting.*
Photo: Jinhong Min



Invited Speaker Dr. **Stephen J. Harris**, *Scientific Engineering Associate at Lawrence Berkeley National Laboratory, presents "Statistical and Machine Learning-Based Durability Testing Strategies for Energy."*
Photo: Joshua P. Hazelnis



Invited Speaker **Tobias Glossmann**, *Principal Engineer at Mercedes-Benz Research & Development North America and Vice Chair of the ECS Detroit Section, delivers a talk on "Advanced Batteries Technologies—Opportunities Revisited."*



ECS University of Michigan Student Chapter officers (from left to right): President **Daniel Liao**, *External Relations Chair* **Christopher Woodley**, *and Secretary* **Joshua P. Hazelnis** *prepare to dish out pizza for a chapter social event.*
Photo: Ryan Van Daele.

To reach a broader body of students and host larger events, the chapter has started collaborating with other student organizations across the University of Michigan (UofM). "Electric Mobility Transition Pathways: Comparing US and India Experience," a seminar co-hosted with the UofM Battery Club, featured Dr. **Rahul Walawalkar**, President and Managing Director of Customized Energy Solutions (India). Professors, post-doctoral students, and graduate students across a multitude of engineering and STEM disciplines attended the seminars. To continue providing our students with diverse experiences, the chapter will invite a range of local and international speakers from industry, national labs, and professors.

The chapter collaborated with the Mechanical Engineering Graduate Council (MEGC) to present a "Lunch and Learn" with industry and academic professionals Dr. **Jeff Lowe** from General Motors, **Shaurya Sarna** from Our Next Energy, Dr. **Javier Parrondo** from Nissan Motor Corporation, and UofM Assistant Professors **Joshua Jack** and **Yiyang Li**. Small group discussions were facilitated by providing each speaker with a table where attendees could enjoy a provided lunch while learning about the professional's individual career path.

The club hosts journal clubs and social events regularly to help inform interested electrochemists on current literature research topics and promote conversations among colleagues in a comfortable small-group setting. Chapter Treasurer **Jinhong Min**, External Relations Chair Christopher Woodley, and Secretary **Joshua P. Hazelnis** hosted three journal club social events, each filled with fruitful discussions, even better refreshments, and pizza! The chapter participated in Student Organization Fairs to connect with students beyond the Engineering and STEM disciplines. Thank you to the University of Michigan's Electric Vehicle Center, Chemistry, Mechanical Engineering, and Material Science Departments, and The Electrochemical Society for their generous support and funding of chapter events.

As the chapter approaches its one-year anniversary, we are excited to keep growing and hosting larger events around campus. For more information and additional details about activities and initiatives, please visit the chapter's website.



Dr. **Javier Parrondo** *(far left) from Nissan Motor Corporation is one of five industry and academic professionals featured in the ECS University of Michigan Student Chapter "Lunch and Learn" series presented in collaboration with the UofM Mechanical Engineering Graduate Council (MEGC).*
Photo: Davy Zeng

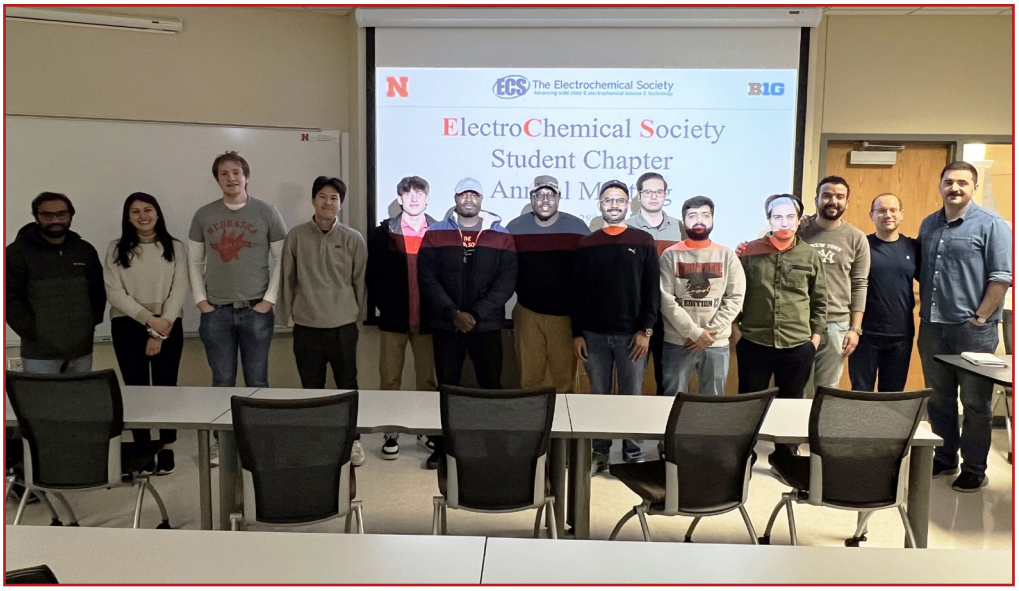


The chapter collaborates with the UofM Battery Club to present "Electric Mobility Transition Pathways: Comparing US and India Experience," a seminar by Dr. **Rahul Walawalkar**, *President and Managing Director of Customized Energy Solutions (India).*
Photo: Daniel Liao

ECS University of Nebraska—Lincoln Student Chapter

The ECS University of Nebraska–Lincoln Student Chapter held its annual executive officers' election on February 28, 2024, in Othmer Hall on the university's campus. Chapter President **Sahand Serajian** ran the meeting and was unanimously reelected for his second term. From among all the nominees, the chapter elected **Oghenetega Obewhere** as Vice President, **Sarang Ismail** as Treasurer, and **Micah Quirie** as Secretary.

With its new advisory board in place, the chapter is planning future meetings and events.



Meet the members of the ECS University of Nebraska–Lincoln Student Chapter!

ECS University of Texas at Austin Student Chapter

In the spring semester, the ECS University of Texas at Austin Student Chapter focused on building partnerships with other student chapters in Texas. In March, we visited our friends at Texas A&M University in College Station. The ECS Texas A&M University Student Chapter organized tours of the laboratories of Professors **Lane Baker**, **Abdoulaye Djire**, **Emily Pentzer**, and **Jodie Lutkenhaus**. We learned about exciting electrochemical research such as titanium nitride 2D materials for electrocatalysis, organic energy storage devices, and novel battery electrolytes. Afterward, we shared a nice lunch and discussed research questions and social activities with ECS Texas A&M Student Chapter members. We also toured the university campus and learned about its history. More information about the visit is on the chapter website.

The University of Texas at Austin (UT)'s long tradition of electrochemistry research began with the late Prof. **Allen Bard**. He founded the Center for Electrochemistry (CEC) at UT to promote excellence in electrochemistry research and foster collaboration. The chapter actively collaborates with CEC on events and seminars. A CEC Fellowship was awarded to chapter Vice Chair **Tushar Telmasre** for the spring 2024 cohort. On February 2, Telmasre delivered a talk on "Simulation Strategies for Measuring Impedance Response of Lithium-Ion Batteries" at the CEC seminar.

We continue hosting our Chalk Talks showcasing chapter members' research in their areas of expertise. We were lucky to host Dr. **Manan Pathak**, former member of Prof. **Venkat Subramanian**'s research group, as part of the series. Dr. Pathak cofounded BattGenie Inc., a company that provides efficient battery management solutions for lithium-ion batteries. His talk provided valuable insight into using graduate research to start a company.

We are excited to announce that research collaborations and publications have resulted from students interacting at our Chalk Talks! Chapter members **Raul A. Marquez** and **Jay T. Bender** published "Transition metal incorporation: electrochemical, structure, and chemical composition effects on nickel oxyhydroxide oxygen-evolution electrocatalysts" in *Energy and Environmental Science* after meeting at a Chalk Talk last year. Chalk Talk recordings can be viewed on our YouTube channel.



(From left to right:) ECS UT Austin Student Chapter Vice Chair **Tushar Telmasre** *introduces the chapter's Chalk Talk series speaker, Dr.* **Manan Pathak**, *Cofounder and CEO of BattGenie Inc.*

Throughout the rest of the year, we are committed to building a strong community of electrochemistry researchers at UT Austin and engaging with scientists in the ECS community beyond our campus!

Hook 'em Horns!

Contributed by **Jay T. Bender** *and* **Anthony C. Concepción**, *Chairs;* **Tushar Telmasre**, *Vice Chair;* **Jeremy Brinker**, *Treasurer; and* **Raul A. Marquez**, *Secretary.*



Dr. **Segun Wahab** *describes nanoscale electrochemical characterization equipment during ECS University of Texas at Austin Student Chapter members' visit to* **Lane Baker***'s lab.*



Houston Smith *explains synthetic chemistry and electrolyte development at the* **Emily Pentzer** *lab during ECS University of Texas at Austin Student Chapter members' visit to Texas A&M University.*



All smiles! UT Austin chapter members gather with Texas A&M student chapter members for a last selfie before heading back to Austin.



ECS UT Austin Student Chapter Vice Chair **Tushar Telmasre** *delivers a talk at a UT Austin Center for Electrochemistry seminar.*

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UPCOMING ECS MEETINGS



PRiME 2024
Joint International Meeting of ECS, ECSJ, and KECS
Honolulu, HI
October 6-11, 2024
Hawaii Convention Center & Hilton Hawaiian Village

247th ECS Meeting
Montréal, Canada
May 18-22, 2025
Palais des Congrès de Montréal

248th ECS Meeting
Chicago, IL
October 12-16, 2025
Hilton Chicago

249th ECS Meeting
Seattle, WA
May 24-28, 2026
Washington State Convention Center

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