

Dear students, faculty, staff, alumni, friends and prospective students,

Welcome to the 2024-2025 academic year! As I begin my second year as Chair of the Department of Materials Science and Engineering (MSE), I remain both humbled and grateful for the support from all of you — and deeply proud of the incredible community we have built together.

While rankings don't define us, we take great pride in our recent achievement: being ranked No. 2 in the nation for both our [undergraduate](#) and [graduate](#) programs, the highest ranking in our department's history by the *US News & World Report*. Beyond our department, we are seeing exciting changes in leadership: Prof. Tsu-Jae King-Liu will soon transition from her role as Dean of Engineering to serve as the next President of the National Academy of Engineering, and our entire Cal community recently welcomed our new Chancellor, Richard Lyons. Additionally, this year's Nobel Prizes in physics and chemistry were awarded to pioneers in integrating artificial intelligence (AI) with traditional sciences — an advancement that will undoubtedly accelerate the application of AI and machine learning in materials research. (And, in a remarkable achievement, Berkeley alumni or former faculty members are represented among the winners of ALL four Nobel science prizes this year: physics, chemistry, physiology or medicine, and economic sciences!) What an exciting time to join Berkeley and the MSE department!

A lot has happened since our last newsletter. In August, we held our inaugural MSE Alumni Day. We have made great progress in building a strong alumni network and in fundraising to support our research and education mission. We're thrilled to welcome our newest faculty member, Dr. Jiyun Kang, and our new staff member, Ms. Julia Shefcik. Professor Thomas Devine retired after an amazing career of 40+ years of research and teaching in MSE. Prof. Lane Martin resigned to assume the position of Director of the Rice Advanced Materials Institute at Rice University. Over the past academic year, we celebrated the graduation of 49 undergraduates, 39 master's students, and 29 PhD students, while welcoming 50 new undergraduates, 39 master's students, and 24 PhD students. We now begin the 2024-2025 school year with a total of 301 students — 133 undergraduates and 168 graduate students. Our team consists of 24 faculty members, one lecturer, and six dedicated staff members.

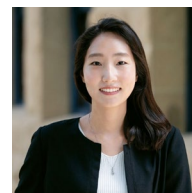
Housed in the Hearst Memorial Mining Building (HMMB) on campus and partly in the Lawrence Berkeley National Laboratory (LBNL), our department continues to push boundaries in materials research, supported by an impressive \$1+ million in research expenditures per faculty member each year, the highest in the College of Engineering. We are also developing a shared materials characterization facility, which will further enhance our research capabilities.

I look forward to another inspiring year working alongside all of you!

Prof. Junqiao Wu, Chair, wuj@berkeley.edu

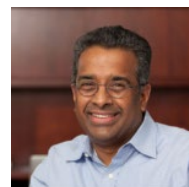
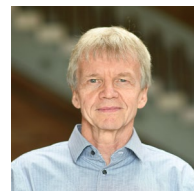
Department news

- The MSE department welcomed our **newest faculty member, Dr. Jiyun Kang**, to join us as an Assistant Professor! Dr. Kang uses AI and high-throughput characterization with a broad range of advanced analytical tools to develop advanced structural materials. Dr. Kang earned a Doctor of Science in Materials Science and Engineering from Massachusetts Institute of Technology (MIT) in 2022, and received postdoctoral training at Stanford University.
- In the newest *US News & World Report* college ranking, UC Berkeley **MSE is ranked No. 2** among undergraduate materials science and engineering programs in the US. This is an upgrade from last year's tied No. 2 ranking. Earlier this year, our graduate program was also ranked No.2 by *US News*. Combined, these are historically the highest-ever rankings for our department!
- Prof. Gang Chen of MIT delivered the **PPG Foundation Lecture** at MSE (September 2024). [Professor Chen](#)'s lecture was on "Photomolecular evaporation from hydrogels and pure water". The PPG Foundation Berkeley Lectureship for Materials Innovation and Service Excellence is



presented to distinguished professors from various institutions who exemplify extraordinary commitment to promoting diversity, overcoming personal and professional hardships, providing exemplary mentorship, and contributing significantly to science and society.

- On Aug. 24, 2024, the MSE Department hosted its [first Alumni Day](#) with a great turnout in HMMB and plans for bigger future events! About 30 local alumni with graduation years ranging from the 1970s to 2000s attended the event to share their reflections on being a MSE alum. MSE faculty and faculty emeritus also attended to share their research or send greetings.
- Published in *Science* in August, 2024, **Prof. Phillip Messersmith's** group developed new recyclable [adhesives](#) that can be easily adapted for medical, consumer and industrial applications. Their uses include superglue that could be a game-changer for fetal surgeries.
- **Prof. Kristin Persson**, Daniel M. Tellep Distinguished Professor in MSE, received the [Distinguished Scientist Fellow Award](#) from the Department of Energy (August 2024). She was honored for “pioneering advancements in data-driven materials design and discovery through first-principles based computations and analysis algorithms that yield materials with optimal properties for engineers and scientists worldwide to accelerate innovation, and for her management and outreach skills that promote the DOE missions.” Prof. Persson was also elected as a [foreign member of the Royal Swedish Academy of Sciences](#) in its 2024 Class for Chemistry. The Royal Swedish Academy of Sciences, founded 1739, was created as, and still is, an independent, non-governmental scientific society with a determination to promote natural science, strengthening their influence in society whilst also encouraging the exchange of ideas between various disciplines. As per terms of Alfred Nobel’s will the Nobel Prizes in Physics and Chemistry have been awarded by the Academy since 1901.
- In July 2024, **Prof. Thomas M. Devine** retired after over 40 years of outstanding research, teaching and service in the MSE department.
- The MSE department welcomed a new staff member, **Ms. Julia Shefcik**, to be our Graduate Student Services Advisor! Julia joined us from UC San Francisco, where she was the Assistant Director of Student Experience in the School of Pharmacy. She brings a wealth of experience in student services and programming.
- **Prof. Haimei Zheng** developed [a new technology](#) that provides electrifying insights into how catalysts work at the atomic level, published in *Nature* in June 2024. The group used powerful microscopes at LBNL's National Center for Electron Microscopy.
- **Prof. R. Ramesh** received an Honorary Fellowship from [Indian Academy of Sciences](#) in May 2024. Indian Academy of Sciences elects up to three distinguished scientists to the Honorary Fellowship each year and the total number is limited to sixty. Prof. Ramesh was also elected to the [National Academy of Sciences](#) (NAS) of the US! Election to the National Academy is one of the highest honors in the scientific field. Members of the NAS serve as advisers to the nation and to the federal government on science, engineering, and medicine. Prof. Ramesh became one of the very few scholars who earned membership in both NAS and NAE (the National Academy of Engineering).
- **Prof. Zak Al Balushi** won the [Academic Innovation Catalyst \(AIC\) award](#) in the Bakar Fellows Program in May 2024! His project is “Rare-Earth Catalysts for Low Temperature Production of Nitrogen Enriched Materials and Chemicals of High Value”.



- **Dr. James Gebhardt**, PhD alumnus of MSE, was elected to the **National Academy of Engineering (NAE)** in 2024! NAE membership is one of the engineering’s high honors According to the NAE website, qualifications include “identifiable contributions or accomplishments in...engineering research, practice, or education.” Dr. Gebhardt is retired from FLSmidth and is the Section Editor-in-Chief for Mineral & Metallurgical Processing for SME’s technical journal *Mining, Metallurgy & Exploration*. In 2024, [three faculty members and ten alumni](#) from the UC Berkeley College of Engineering were elected to NAE, accounting for more than 10% of this year’s new NAE members.



- MSE alum **Rachel Huang** was named in [Forbes 30 under 30](#), a yearly list of 30 notable people under 30 years old who are changing the world.

- As [reported](#) in *Nature* in October, 2023, the research groups of **Professor Ceder** and **Professor Persson** collaborated on the creation of an Autonomous Laboratory (A-Lab) for the synthesis of new inorganic materials. Using integration with the [Materials Project](#), text-mined synthesis knowledge from over 5 million research papers, and data from Google Deepmind, the A-Lab demonstrated autonomous synthesis of 41 novel compounds predicted by the Materials Project. This robotic laboratory, driven by AI and data from the Materials Project, is expected to significantly accelerate the development of novel materials for clean energy.



- **Prof. Gerbrand Ceder**, a leader in energy storage research, brings urgency to his life’s work in discovering essential materials for a battery-powered future by developing the [Autonomous Laboratory](#), or the A-Lab.

- In 2023, the Web of Science™ list of global [Highly Cited Researchers](#) includes MSE’s Profs. **Gerbrand Ceder**, **Kristin Persson**, **R. Ramesh**, **Robert Ritchie** and **Junqiao Wu**. Each researcher selected has authored multiple Highly Cited Papers™ which rank in the top 1% by citations for their field(s) and publication year in the Web of Science™ over the past decade. According to Clarivate, of the world’s population of scientists and social scientists, Highly Cited Researchers™ are 1 in 1,000.

- In a paper [published](#) in *Nature* in September 2023, a research team led by **Prof. Ting Xu** has developed a high-performance coating material that self-assembles from 2D nanosheets and could significantly extend the shelf life of electronics, energy storage devices, health & safety products, and more. The nanomaterial breakthrough is also recyclable and could enable a sustainable manufacturing approach that keeps single-use packaging and electronics out of landfills.



- **Prof. Rayne Zheng** and their team have [developed](#) an innovative design method that leverages artificial intelligence and additive manufacturing to ensure that optimum functionality and target behaviors are built into these specialized materials.

- **Prof. Mark Asta** won the **David Turnbull Lectureship** from the Materials Research Society (MRS) in October 2023! According to MRS, the prestigious [David Turnbull Lectureship](#) recognizes the career contribution of a scientist to fundamental understanding of the science of materials through experimental and/or theoretical research.



- **Dr. Matthew Sherburne** is the new CEO of BEARS, the [Berkeley Educational Alliance for Research in Singapore](#) (BEARS). Dr. Sherburne currently splits his time between educating our students in MSE and extending Berkeley Engineering’s impact globally. Dr. Sherburne also serves as the Director of International Partnerships of the Dado & Maria Banatao Center for Global Learning and Outreach (known as the GLOBE center).



- In October, 2023, **Prof. Robert Ritchie** was elected as a Foreign Fellow of the [Academy of Athens](#). The Academy is Greece's national academy and the highest research establishment in the country for the advancement of the Sciences, Humanities and Fine Arts. The Academy of Athens was established in 1926, with its founding principle tracing back to the historical Academy of Plato (387 BC!), and operates under the supervision of the Greek Ministry of Education.
- **Professor Ceder** and MSE student Bowen Deng's paper made the cover of [Nature Machine Intelligence](#) in September, 2023. In this paper, the authors develop CHGNet, which is a universal machine-learned potential to model materials much faster than with typical first-principles methods. The need to quickly discover new materials and to understand their underlying physics in the presence of complex electron interactions calls for advanced simulation tools.
- MSE student Yifan Jiang, alum Karen C. Bustillo and **Prof. Thomas M. Devine** [published](#) a paper on *Corrosion and Materials Degradation* to elucidate how zinc ions lower the corrosion of Alloy 600 in pressured water reactors.
- **Prof. Gerbrand Ceder** co-leads a [new consortium](#) in LBNL to make batteries for electric vehicles more sustainable. The consortium, led by the nation's best battery scientists, will accelerate the commercialization of a new family of battery cathode materials called DRX or "disordered rock salt."
- The Bakar Fellows program selected **Prof. Phillip Messersmith's** project for the [Sparks Award](#) in September, 2023. Prof. Messersmith hopes to improve hydro dissection by using hydrogels. These lightweight materials are biocompatible and biodegradable, easily injectable and mechanically strong enough to displace tissues.
- Singapore's Deputy Prime Minister, Mr. Heng Swee Keat, [visited Prof. Gerbrand Ceder's](#) lab, an automated, accelerated lab controlled by AI software, at the Lawrence Berkeley National Laboratory.



Student Awards and Recognitions

Hertz Fellowship: Calton Kong

Blumentkranz Summer Fellowship: Hwidong Jeon, Abdullah Anwar H. Alhamadat, and Bryant Le Nguyen

Corrosion Award: Colin Suits, Jason Pracher

Departmental Citation Award: Calton Kong

Didier de Fontaine Student Award in Theory and Computation: Nathan Szymanski, Guy Moore

Elaine Shen Award: Robert Yang, Jennifer Toy, Calton Kong, Yuritza Neri, Brandon Lou

Gareth Thomas Award: Pravin Kavle

Jane Lewis Fellowship: Mackinzie Farnell, Rohith Srinivaas Mohanakrishnan, Sherrie Quan, Shilong Wang

Jing Gui Award: Sydney Hemenway, Xiaochen Yang, Cheng Zhu, Sanchay Gadia, Xu Hang, Yuhang Cai

MSE Graduate Student Equity and Inclusion Fund: Mark Ma

Outstanding GSI award: Perapat Pete Gatenil, Min Chen

Vedensky Award: Shilong Wang, Wenqing Wang

ECS Battery Division Graduate Student Award: KyuJung Jun

NSF Graduate Research Fellowship: Alexandre Richard-Henry Bordas, Daniel Yijun Guo, Galio Guo, Calton Kong, Melissa Elizabeth Stok

GEM Fellowship: Daphne Michelle Lucana



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