

AIChE® 35 UNDER 35

This Year's Young Trailblazers

The AIChE 35 Under 35 Award honors 35 chemical engineering professionals under the age of 35 who have made great contributions to the field, as well as to AIChE. These young individuals will pave the way for future generations, serving as role models and innovators. The recipients of the awards were selected for their achievements and contributions in one of seven different categories:

- bioengineering (6 winners)
- chemicals and materials (9 winners)
- education and outreach (2 winners)
- energy and environment (6 winners)
- innovation and entrepreneurship (3 winners)
- leadership (7 winners)
- safety (2 winners).

These award winners embody what it is to be an

accomplished chemical engineer. From graduate students, researchers, entrepreneurs, professors, and industry professionals, these individuals are career-driven, but also lead interesting lives outside of their work (Figure 1). This article introduces this year's young trailblazers and gives you a glimpse of their work, research, and personal interests.

All winners will be formally recognized and celebrated during an awards reception at the 2023 AIChE Annual Meeting in Orlando, FL (Nov. 5–10, 2023). In addition, each awardee will receive a cash prize of \$500, have their profiles highlighted throughout AIChE and the chemical engineering community, and receive complimentary AIChE membership for 2024. For more details about the award and to get to know some of the past winners, please visit www.aiche.org/35under35.



Bioengineering



Chemicals and Materials



Education and Outreach



Energy and Environment



Innovation and Entrepreneurship



Leadership



Safety



▲ Figure 1. From left to right: Christina Bailey-Hytholt, Michelle Calabrese (above), Alex Abramson (below), Mariah L. Arral, Sasha Ebrahimi (above), Chang Dou (below), and Michele L. Sarazen.



Omar Abdelrahman, 33
Assistant Professor
Univ. of Massachusetts Amherst



Abdelrahman's research expertise focuses on catalysis and reaction engineering. His lab develops and disseminates experimental designs using custom scientific equipment that he builds in-house to help lower the barrier to entry in catalysis research. Growing up in the Middle East influenced his decision to become a chemical engineer. Abdelrahman hopes that his research will help speed the energy transition of the chemical production sector toward a more sustainable future. If he wasn't a chemical engineer, he would have been a historian or economist.



Christina Bailey-Hytholt, 29
Assistant Professor
Worcester Polytechnic Institute



Bailey-Hytholt researches biomaterials and drug delivery, particularly for women's health and prenatal patients. For example, she developed placental models and lipid-based drug- and gene-delivery systems to help treat pregnancy-related complications. She is passionate about her research and plans to develop new *in vitro* models of the maternal-fetal interface, as well as new therapeutics for prenatal care in the future. Bailey-Hytholt enjoys kayaking, hiking, crocheting, and gardening during her free time. Her favorite place that she has gone kayaking is Kauai, HI.



Alex Abramson, 30
Assistant Professor
Georgia Institute of Technology



Abramson's research focuses on drug delivery and bioelectronic therapeutics. His team developed a capsule capable of delivering macromolecule drugs — such as insulin, monoclonal antibodies, and mRNA nanoparticles — with a comparable bioavailability and pharmacokinetic profile to a subcutaneous injection; this capsule has entered clinical trials. His goal is to develop a network of wearable sensors and implantable devices that can help maintain homeostasis by first engineering an artificial nervous system capable of communicating changes to the wearables. He has been recognized on *Forbes'* 30 Under 30 List, and he is an *MIT Technology Review* Innovator Under 35. He enjoys watching movies and has hiked in more than 20 national parks.



Michelle Calabrese, 33
Assistant Professor
Univ. of Minnesota



Calabrese's research group employs rheology, soft matter physics, and polymer and nanoparticle synthesis to address a range of fundamental and applied problems in polymer and soft materials engineering. During her undergraduate education, she switched majors from bioengineering to chemical engineering, as the latter allowed her to focus on addressing more wide-ranging problems, from therapeutic delivery to green energy. She hopes that her research group will be recognized both for their scientific contributions and their efforts to improve diversity, equity, and inclusion in science, technology, engineering, and mathematics (STEM). In her free time, Calabrese likes to listen to live music and enjoys playing soccer weekly.



Mariah L. Arral, 27
NIH National Research Service
Award Fellow and PhD Candidate
Carnegie Mellon Univ.



Arral aims to lead her own research program as a tenure-track professor, focusing on drug delivery challenges for understudied groups such as the elderly and pregnant people. Her research focuses on developing new materials for lipid nanoparticles and understanding the relationship between materials, delivery, and immunogenicity. She also conducts engineering education research related to neurodiversity. Having experienced prejudice in the past due to her disability, she advocates for others with disabilities by educating the community. She strongly believes that disabilities do not hinder success and can instead improve teamwork and problem-solving skills, leading to better outcomes. Arral has traveled to 12 countries.



Christopher Cogswell, 33
Global Engineering and
Customer Consultant
Elsevier



As a subject matter expert on climate change, carbon capture and utilization, and sustainability, Cogswell consults with major government, academic, and corporate clients throughout the world on issues relating to the digital transformation of their workforce, creating sustainable and safe engineering practices, and developing solutions to meet their needs. He wants to continue growing his knowledge of the sustainability industry and make a positive impact on the way engineering problems are solved. Cogswell hosts a podcast called "The Mad Scientist Podcast," where he discusses the philosophy and history of science and pseudoscience. The podcast has over 1.5 million total downloads.



Matthew Crane, 34
Assistant Professor
Colorado School of Mines



Crane's research focuses on developing design rules and manufacturing methods for the application of optoelectronic nanomaterials in energy and computing. A goal of his is to realize different technologies that can be enabled by colloidal nanomaterials and bridge the gap between the synthesis of these materials and their application in new devices. He co-founded a start-up, BlueDot Photonics, which is innovating solar technologies and materials that will help mitigate climate change. Crane and his partner have two cats, one of which is named in honor of David Bowie. He also recorded an album with his band, Better off Ed, the week before defending his PhD thesis.



Helen E. Durand, 34
Associate Professor
Wayne State Univ.



Durand is most proud of the achievements of her students; in fact, her first PhD student recently graduated. Her research group focuses on utilizing control theory, physics, and math to mitigate cybersecurity hazards for industrial control systems. She loves to challenge herself to learn new things, both in and outside of work. For example, when she was an undergraduate student, she joined the color guard team and had to learn several choreographed dances, as well as the intricacies of marching routines. Outside of work, Durand is working on a screenplay and is proud of her progress moving it toward a complete draft.



Gözde S. Demirer, 31
Assistant Professor
California Institute of Technology



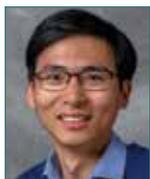
Demirer's lab focuses on the engineering of plants and the rhizosphere for food security, sustainability, and climate change resiliency using novel nanotechnology and synthetic biology approaches. She hopes that her team's research will contribute to the sustainable production of crops and food. Demirer was born and raised in Istanbul, Turkey. She was inspired to pursue chemical engineering by her mother, who worked in research and development (R&D) at a cosmetics company and was also a chemical engineer. Demirer enjoys dancing and listening to music.



Sasha Ebrahimi, 28
Principal Scientist and
Associate Fellow
GSK



At work, Ebrahimi researches molecular-level design rules for engineering protein-based medicines with appropriate developability profiles for clinical and commercial use. He hopes that his career will see the development of many new life-changing drugs. His scientific interests lie in engineering materials to solve fundamental challenges in medicine. He considers mentoring to be one of the most important aspects of being a scientist and hopes to continue mentoring those going into the field of healthcare and medicine. Ebrahimi loves to run and claims to be the biggest Shawn Mendes fan.



Chang Dou, 34
Senior Engineer
Lawrence Berkeley
National Laboratory



Working in the Advanced Biofuels and Bioproducts Process Development Unit, Dou leads process analytics R&D to bridge lab innovation and commercial success in advanced biomanufacturing. He aspires to further drive the convergence of sustainable technologies into viable commercial products, especially within the industrial biotechnology field. Dou loves the outdoors. In 2011, he traveled to Lhasa, Tibet, with a friend to hike and hitchhike more than 1,300 miles along the China G318 route (approximately the distance between New York and Miami).



▲ **Figure 2.** Outside of work, Courtney Flood is a wine enthusiast. For three months, she has blind-tasted over 15 wines daily while studying for her Wine & Spirit Education Trust (WSET) diploma.



Jeremy T. Feaster, 32
Principal Investigator and
Research Staff Scientist
Lawrence Livermore
National Laboratory



Feaster and his team create 3D-printed electrochemical reactors to transform air into fertilizer and convert CO₂ into fuels and chemicals. His research focuses on using advanced manufacturing and chemical engineering to build a sustainable world. He leads the Jeremy T. Feaster Foundation, a nonprofit organization that, over the past 11 years, has awarded over \$20,000 in scholarships to Black and underrepresented students around the nation. Feaster enjoys winemaking with his friend and has partnered with local vineyards and wineries to increase their production of several varietals. He has practiced mixed martial arts for more than 11 years.



Courtney Flood, 29
Vice President - Marketing and
Business Development
LBB Specialties



Working as a commercial strategist, Flood is the youngest operating executive in the U.S. specialty chemical distribution industry. She started her career early, beginning college at the age of 14. She specializes in business-to-business distribution, organizational design, corporate partnerships/joint ventures, and sales and marketing team development. Flood has mentored local New York City chemical engineering students to pursue their first internships and careers. She is a hobby genealogist, researching and building family trees for others for over ten years. She is also studying for her Wine & Spirit Education Trust (WSET) diploma and has been blind-tasting over 15 wines daily in preparation (Figure 2). Flood is currently training for a triathlon.



Ankur Gupta, 33
Assistant Professor
Univ. of Colorado, Boulder



Gupta's research group studies interfacial phenomena, including electrochemical interfaces, colloidal motion, and microhydrodynamics for applications in energy storage, desalination, and lab-on-a-chip technologies. He and his group aspire to delve into the design of porous electrodes using electrolyte transport phenomena, with the goal of advancing energy storage technologies. Gupta is an avid chess fan and follows the game every day. He enjoys playing bullet chess and solving various chess puzzles in his free time. He has watched the series "The Office" numerous times and hopes to write a research paper that combines his academic pursuits with his love for the show.

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GSK

GSK congratulates
Sasha Ebrahimi
on being recognized with
AICHE's 35 under 35 award



At GSK, we unite **science, technology** and **talent** to get ahead of disease together. We are a company where **outstanding people** thrive and use their talents and passions to focus on working together, innovating together to deliver on our culture of being **ambitious** for our patients.



Deeksha Jain, 31
Senior Research Specialist
Dow



Jain is involved in the discovery, development, and scale-up of catalysts for Dow's ethylene oxide technology. She values mentorship and would like to give back to the chemical engineering community by mentoring early-career professionals. Her goal is to lead and drive impactful research in catalysis and related fields to create a net positive impact on society. She hopes her work will aid in solving challenges such as climate change and natural resource depletion. Jain enjoys spending time with family and friends, as well as traveling. Thus far, she has visited 26 U.S. states and hopes to visit the remaining ones in the next decade.



Aditi Khadilkar, 34
Process Technology
Development Manager
Intel Corp.



Khadilkar's teams focus on developments in lithography to find novel patterning solutions and equipment development. Her research interests span across energy, materials, semiconductors, and data and their integration. She hopes to initiate a research institute to drive toward integrated energy solutions using smart materials and devices. Khadilkar loves to read and always ends up getting a new book when visiting a bookstore or library. She also enjoys astrophysics, neuroscience, classical music, and hiking.



Jovan Kamcev, 33
Assistant Professor
Univ. of Michigan



Kamcev's research group focuses on developing structure/property relationships to guide the design of next-generation polymeric materials for water treatment, energy generation, and energy storage applications. Whenever he encounters challenges in research, he is excited to see unexpected results as it indicates that there is something new to be learned. He is looking forward to navigating the tenure process, graduating his first PhD student, and hopefully becoming a leader in the field of membrane science. Kamcev was the captain of his high school's basketball and volleyball teams. He knows the lyrics of nearly every song by the Beatles.



Sophie (Sun Hye) Kim, 30
Associate Research Scientist
Dow



As a data scientist, Kim has worked on various projects related to data visualization, forward and inverse formulation modeling, natural language processing, and user-interface development. Due to her interdisciplinary background in chemical engineering and computational science, she hopes to stay on top of recent technological developments and employ cutting-edge methods to address complex challenges in the material science and chemical industries. In her career, she hopes to serve as the bridge between traditional engineers and data scientists. If she weren't a chemical engineer, Kim would have been a travel blogger. She would have also liked to be a dog trainer since she enjoys spending time with dogs.



Pranav Karanjkar, 34
Associate Research Scientist
Dow



Karanjkar develops new processes to convert lignocellulosic biomass to value-added chemicals. He has investigated alternative catalysts and reactor designs that could provide a step change in process technology, as well as a competitive cost advantage. His career goal is to continue gaining experience in reaction engineering. He met his wife, who is also a chemical engineer, while pursuing research interests. In his free time, Karanjkar enjoys wildlife photography and traveling around the world with his wife (Figure 3). His current favorite fiction book is "Project Hail Mary" by Andy Weir.



▲ **Figure 3.** Pranav Karanjkar loves to travel around the world with his wife and take photos of the wildlife that are present.



Yuzhang Li, 32
Assistant Professor
Univ. of California, Los Angeles



Li's research group focuses on inventing new tools and materials that can accelerate next-generation renewable energy solutions, such as leveraging cryogenic electron microscopy to address challenges in sustainability. One challenge he faced was starting his faculty career during the pandemic, which he overcame by focusing on the things he could control. This allowed him to stay present and accomplish the task at hand. Outside of work, Li enjoys staying active by playing basketball and weightlifting. The highlight of his basketball career was when he scored a basket on Jeremy Lin in high school. Li one day hopes to participate in the Los Angeles marathon.



Christopher Lowe, 34
Senior Staff Engineer
Takeda



Lowe is responsible for developing manufacturing processes for protein therapeutics at the lab scale and shepherding those processes through scale-up and transfer for clinical and commercial manufacturing. His primary expertise is in mammalian cell culture. Recently, he has also focused on expanding bioreactor automation capabilities in Takeda's process development labs. As an active member of the Young Professionals Committee, he helped launch AIChE's Beer Brewing Competition, which takes place at the Annual Meeting every year. Lowe enjoys brewing classic German lagers.



Shelby Mills, 31
Scientist
Glycosyn, LLC



As a scientist, Mills performs a core analytical role operating and maintaining two high-performance liquid chromatography (HPLC) instruments and determining all of the precursor and product titers in the experimental fermentation runs. She also contributes to strain engineering work. Her goal is to become a senior scientist and eventually pursue a management role, either in project management or leading a team of younger scientists. A personal goal of hers is to raise a loving family with her husband. Mills is regularly involved with her faith and church community. Her birthday is on February 29th — leap day.

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The Department of
 Chemical Engineering
 at UMass Amherst
 congratulates

Omar
Abdelrahman
 for receiving the

AIChE
35 under 35 award!



Nitish Mittal, 34
Staff Research Engineer
ExxonMobil



Mittal leads and supports process systems engineering and technoeconomic analysis of chemical reaction and separation processes. His work thus far has led to three patents. He comes from a family of engineers, with his father being a mechanical engineer and his older brother being an electrical engineer. Recognizing that mentorship has played an important role in his career development, he plans to pay it forward by mentoring students and young professionals. He is the Communications Chair for the AIChE South Texas Section. Mittal has traveled to four of the six habitable continents and plans to visit the remaining two soon.



Ashley Pennington, 33
Senior Chemical Engineer and
Resilience Specialist
Cybersecurity and Infrastructure
Security Agency (CISA)



As a resilience specialist, Pennington provides technical expertise on the chemical sector supply chain, security, and climate resilience. Her goal is to continue to make knowledge of science safety more available to the public, as well as to bring awareness of the importance of safety and resilience of the chemical industry to lawmakers, regulators, people working with chemicals, and others. Pennington is the oldest of seven children. In her free time, she enjoys volunteering at the Virginia Renaissance Festival. She also enjoys camping and backpacking in the woods.



Victoria Muir, 27
Presidential Postdoctoral
Research Fellow
Princeton Univ.



Muir's current research focuses on microbe-virus interactions in porous media. She is an incoming tenure-track assistant professor at the Univ. of Delaware for 2024. Her research lab will focus on designing soft materials for 3D bioprinting, injectable tissue repair, and microbiome research. Muir has been a Zumba instructor for more than eight years and has also taught barre and high-intensity interval training (HIIT). She is a big fan of all things Star Wars and named her dog after Ahsoka Tano.



Zhe Qiang, 31
Assistant Professor
Univ. of Southern Mississippi



Qiang's group currently researches materials and manufacturing of polymers and their derived functional materials, including pioneering the additive manufacturing of functional carbons using plastic waste materials. His goals focus on the sustainable development and decarbonization of the chemical industry through research. He hopes to educate the next generation of engineers and scientists, as well as promote a diverse workforce. Qiang enjoys listening to hip hop music. He also likes to travel and explore different parts of the U.S.



Joel Paulson, 33
Assistant Professor
Ohio State Univ.



Paulson's research interests are in data-driven optimization, physics-informed machine learning, and model predictive control. He won the National Science Foundation (NSF) CAREER Award in 2023, which allowed his research group to develop data-driven optimization algorithms for solving problems related to sustainable energy storage and management. He plans on developing open-source software for data-driven optimization and interpretable machine learning so that algorithms developed by his research group are accessible to many people. Paulson is a huge basketball fan and loves playing first-person shooter (FPS) video games. He was once a highly ranked online Halo 3 player.



▲ **Figure 4.** Joaquin Resasco leads an active lifestyle. As shown above, he enjoys climbing mountains and hopes to climb all peaks taller than 14,000 ft in the U.S.



Sreekanth Rajagopalan, 33
Associate Research Scientist
Dow



Rajagopalan develops end-to-end advanced analytics solutions for manufacturing operations, supply chain management, and commercial functions. His work focuses on process systems engineering and operations research, a mix of math and computational science, which he enjoys. He wants to make decision science and related toolkits equitable and approachable, as well as apply his background in systems thinking for social good. Rajagopalan loves listening to Carnatic music (a type of Indian classical music). He is currently learning how to fly a glider/sailplane and hopes to do it solo.



Joaquin Resasco, 33
Assistant Professor
Univ. of Texas at Austin



Resasco was inspired to pursue chemical engineering because his father was a professor in the field, specifically in the field of catalysis. He followed in his father's footsteps, and today, Resasco's research group focuses on understanding and designing next-generation catalysts that can enable sustainable technologies. He is proud of having had a positive impact on his students, whether it be through teaching or mentoring. Resasco hopes to climb all peaks taller than 14,000 ft in the U.S. (Figure 4). His two most prized possessions are his wok and his snowboard.



Julie Rorrer, 30
Assistant Professor
Univ. of Washington



Rorrer's research group develops catalytic processes to convert plastic waste and sustainably derived materials, such as bio-derived molecules, into higher-value chemicals and renewable fuels. She led the creation of the coloring book series ColorMePhD, which explains research papers to a broad audience using coloring pages. Since its launch in 2018, over 30,000 free coloring books have been downloaded around the world. Rorrer has played the violin since she was four years old. She also loves science fiction books and television, and she sometimes writes her own science fiction short stories.

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Michele L. Sarazen, 34
Assistant Professor
Princeton Univ.



Sarazen hopes to advance catalytic active site engineering for efficient energy manufacturing transformations. Her work involves making cognizant design decisions concerning sustainable catalyst synthesis. Sarazen's research group couples synthetic, kinetic, and theoretical investigations of porous crystalline materials as catalysts and adsorbents for sustainable fuel and chemical production with an emphasis on reaction and deactivation mechanisms. She enjoys traveling and experiencing new cultures through their food and history. If she wasn't a chemical engineer, Sarazen would have pursued a degree in history.



Michelle Teplensky, 30
Assistant Professor
Boston Univ.



Teplensky's research focuses on engineering immunology through nanomaterial control over biomolecular architecture. Through this control, her research group can impact cancer treatment and protect against infectious diseases, which require an interdisciplinary approach to advance current strategies. She hopes that the students trained in her lab enter their careers feeling inspired. Teplensky loves to shop at Stew Leonard's, and she has become an avid fan of Boston Univ.'s hockey team. Her family has a tradition of buying and completing a puzzle on every vacation.



Kayla G. Sprenger, 33
Assistant Professor
Univ. of Colorado Boulder



Sprenger's lab focuses on multi-scale computational approaches to design immunotherapeutics against a wide variety of infectious and neurological diseases. She hopes to publish and establish her lab's research in the areas of computational immunology and machine learning-driven vaccine design. She is proud of her lab's diverse and inclusive environment, the majority of which are female engineers, including one first-generation college student. During her spare time, Sprenger enjoys walking, hiking, and biking with her partner and son (Figure 5). She has played soccer since she was five and loves to play the violin and sing.



Haotian Wang, 33
Associate Professor
Rice Univ.



Wang became a chemical engineer to pursue his dream of building a clean factory that is based on classical electrochemistry. Thus, it is fitting that his research group focuses on developing novel nanomaterials for energy and environmental applications, including energy storage, chemical/fuel generation, and water treatment. His goal is to be able to contribute to lowering the chemical process industry's global carbon footprint. Wang enjoys playing mahjong and has spent a lot of time playing the game.

CEP



William Tarpeh, 33
Assistant Professor
Stanford Univ.



Tarpeh's research group develops and evaluates selective separations of wastewater at several synergistic scales: molecular mechanisms of chemical transport and transformation; novel unit processes that increase resource efficiency; and systems-level assessments that identify optimization opportunities. One of his goals is to realize the vision of reimagining wastewater as a source for valuable products. As a child, Tarpeh first aspired to be a paleontologist. If he wasn't a chemical engineer, he would have studied history.



▲ **Figure 5.** Kayla Sprenger enjoys spending time with her son, whether that means playing with him in a ball pit, walking, hiking, or biking.