

Expanded Undergraduate Tutoring and Mentoring Projects Help Students Thrive

Near-Peer Undergraduate Student Learning Projects



Students work in small groups in the weekly learning sessions in McKenzie Hall.

Adam Glass, an instructor in the chemistry department, has been working closely with senior instructor Mike Koscho to expand a near-peer learning project aimed at helping hundreds of undergraduates better learn organic chemistry. Glass teaches in the non-majors organic chemistry sequence, where enrollments very often top 300 students. In the mid-2010s, Koscho implemented teaching assistant-led active learning activities once a week for the parallel organic course designed for chemistry majors, with enrollments of approximately 70 students. Koscho noted very good results from this addition to the majors course. At that time, the larger non-majors organic chemistry course was still very much a traditional lecture, Glass says. To supplement, “We had office hours, the SuperChem program led by Deborah Exton, and

peer learning assistants that held office hours.”

SuperChem, Glass notes, is a successful Peer-Learning Assistant (PLA) program for additional student support. The more recent learning experiences of “near-peers,” or students who have recently succeeded in a course, can help bridge communication styles, bring fresh problem-solving skills, and build community in a large science class. To get the most out of peer learning, Koscho and Glass began integrating PLAs more closely into the non-majors course with required, structured active-learning sessions. “We did that for the first time in fall 2023, and we’ve seen it be very successful,” Glass notes. “Student engagement went up. General exam scores and DFW rates (drop, fail, and withdrawal) improved. We no longer really observe the sort of bimodal distribution that was common for the larger course.”

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Tutoring and Mentoring Projects

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“It’s a really cool experience for someone who is interested in teaching to have some actual experience in curriculum development.”

PhD student Allison LaSalvia, Cook Lab



PLAs Ahn-Thi Pham and Gabe Oh-Keith lead a Friday tutoring session during spring 2024.

The new learning sessions take place in McKenzie Hall, which has “active learning” classrooms with enough tables to accommodate about 100 students working in small groups. Six to eight students sit at a table and discuss worksheets related to in-class topics, with undergraduate PLAs leading the sessions. The uniqueness of the program is to bring the techniques of small-group active learning to a larger-group session. “That hasn’t been done much at the UO in part because of the challenges of class size,” says Glass. “When we first started, we put more emphasis on training the PLAs to engage with the students because we wanted it to not be a discussion or lecture session—we want the students to work together on the worksheet and communicate with each other in a different experience than in a typical class. The goal is to supplement lectures with these deeper student-centered learning activities.” Glass says the hardest part was getting the students to actively participate, as some students are reluctant to speak in front of a group. However, with constant encouragement, opportunities for extra credit, and making it more of a fun, non-formal session, they got buy-in. By the end of the term, the PLAs had the students coming up to the board to present and discuss their answers. “By the third term of organic, I really saw a marked difference,” Glass observed.

GE Allison LaSalvia, a member of the Cook lab, understands the challenges faced by undergraduates at large institutions such as the UO and wants to improve their learning. She attended Knox College, a small liberal arts

college with around 1,000 students, where she enjoyed a lot of one-on-one time with instructors, before coming to the UO. “The biggest lecture I ever took during undergrad had 40 people.” LaSalvia worked closely with Glass, creating the worksheets and activities based on what he teaches in the class. She trained the PLAs on the material to lead the discussions. “I observe, go back and forth between the sessions, and answer any questions.” She says it has been interesting and rewarding to bring those experiences to this space. “Students today don’t like to come up to the board in front of the group because they are afraid that they might be wrong,” she says. Now that she’s doing her own PhD-level research, she understands that so much of research is based on trying things, being wrong, and then trying again. “Having the wrong answer is a really difficult thing for a lot of people,” she says. “Our hope and our desire for this program is to give people a way to get past that and to try to develop skill and passion for learning in a way that isn’t just tied to a grade.”

Based on its success, the department hopes to expand this program to additional chemistry courses. “There are many benefits beyond the classroom,” says Department Head Vickie DeRose. “It’s professional development for the PLAs, who are our chemistry and biochemistry majors. The informal, student-centered learning process builds community for the students. We need to do all that we can to help undergraduate students learn and enjoy science, and be able to carry that to the next level at the UO and beyond.” ■

Department Head's Perspective



Greetings from the Department of Chemistry and Biochemistry! This newsletter summarizes developments since our last full newsletter in late fall 2022. We hope that you enjoy the updates.

Do you remember your first general chemistry class? Our lead stories on enhancing student learning and mentoring reflect the importance of our education mission. Thousands of student credit hours are dedicated to educating undergraduate students in the general and organic chemistry courses. These foundational classes are gateways to the wonderful worlds opened by chemical knowledge. Our challenge is to continue to provide high-quality learning experiences in the face of changing undergraduate student landscapes—influences of COVID years on preparation, new technologies, and other factors all create new aspects for incoming students. The newsletter stories highlight a new Catalyst mentoring program designed to support incoming freshmen from diverse backgrounds, and a massive effort to introduce more near-peer instruction into our core courses. I'd like to note that these important efforts, particularly the near-peer learning assistants, are only possible through generous alumni donations. Thank you—this support

influences all of our chemistry undergraduates!

We're also very pleased to highlight the new faculty who joined the department this past year. Matthias Agne, Romila Mascarenhas, and Teresa Rapp are establishing exciting new research programs in the department, expanding our research directions in materials, biochemistry, and chemical biology, respectively. Amber McConnell joins us as a career instructor, adding expertise to our critical instructional group. In our next newsletter we will highlight additional faculty joining us from the 2023–24 search activities. As we adjust to retirements and respond to new opportunities in the national research landscape, faculty hiring remains a priority.

This newsletter highlights multiple awards and research and leadership accomplishments of both faculty and students, and celebrates promotions of Scott Hansen and Chris Hendon to associate professor with tenure. Another highlight made in the newsletter is the inaugural McConnell Lectureship, made possible by the generous donation of Emeritus Professor Hayes Griffith.

After a couple of years in different venues, we enjoyed celebrating 2024 graduation again in the Willamette Atrium. Large-scale events such as the holiday party, graduate visitation weekend (with more than 50 prospective students!), and graduation are only possible with the amazing support of staff members. I'd like to call out the wonderful work of Christi Mabinuori, Leah O'Brien, and Helen Durany, as well as others who are constantly supporting Department of Chemistry and Biochemistry endeavors.

The year 2024 marks the 130th anniversary of the founding of the University of Oregon Department of Chemistry! The department has a rich history of excellence and many astonishing alumni. We remain extremely grateful to friends of the department who generously support our student scholarships, research, and learning resources. ■

“Our challenge is to continue to provide high-quality learning experiences in the face of changing undergraduate landscapes.”

*Department Head
Vickie DeRose*

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Welcome New Faculty

Amber McConnell

Instructor **Amber McConnell** says she had an affinity for chemistry ever since her first high school chemistry course. “I really liked the beauty of the science,” she says. “It seemed very applicable to real life, and I could see it in my everyday interactions with things like cosmetics and cooking.”

While she enjoyed research during her PhD studies, McConnell found that she enjoyed working one-on-one with students doing tutoring sessions and holding office hours even more. After taking a tenure-track teaching position and doing some research, McConnell felt the pull to teach even more strongly. “The part that I enjoyed the most was being in the classroom and diving into the pedagogy,” she says. She then took an instructor position at Eastern Washington University, focusing on teaching introductory chemistry. While there, she founded the Women in Science Club and directed a Women in STEM Symposium, which hosted local high school students and showcased research by undergraduate students and faculty.

Her new position as instructor at the UO is “perfect” for her, she says, because she gets to focus her teaching on introductory courses. “I get to see students right at the start, to potentially jumpstart their love for chemistry,” she says. Outside of teaching, McConnell is also excited about outreach projects, and she hopes to develop opportunities for community engagement. “Going to schools, tabling, demonstrations,” she says. McConnell hopes to forge connections between the university, the department, and the local schools through activities such as STEM activity nights or parent-teacher events. Welcome, Amber!

AMBER MCCONNELL



MATTIAS AGNE



Matthias Agne

Assistant Professor **Matthias Agne**, originally from the Philadelphia area, completed both his bachelor’s and master’s in material science at Drexel University. “I was an undergraduate researcher for four years there working on high-temperature ceramic materials such as aerospace composites and very mechanically motivated structural materials, which I really enjoyed,” he says. “I grew up working on cars and doing other mechanical things and that connection with the mechanical properties of materials is really what pulled me into materials research.”

For his PhD at Northwestern, Agne learned about semiconductor devices, where he worked on thermoelectric materials that convert heat into electricity using temperature differentials. Agne then moved to Germany for a three-year postdoc in a solid-state battery lab at the University of Muenster. There, he honed in on understanding how local structure, especially crystalline structure, was related to how ions move within these materials. His UO research group is now working on understanding how chemistry can be used to tune thermal and ionic transport of materials. “We’re building a hierarchical understanding of electrochemical devices like solid state batteries,” he says.

Having the Oregon Center for Electrochemistry here was a big motivator for Agne to answer the UO’s call for a new energy and environmental materials faculty member. “It was a very clear way to plug in to this field and build something here at the University of Oregon.” Although Agne had not been to the Pacific Northwest before his interview, the beauty as well as the supportive culture he found at the UO drew him in. Agne’s tenure-track position officially started in September 2023. Welcome, Matthias!

Romila Mascarenhas

Born and raised in India, Assistant Professor **Romila Mascarenhas** completed her bachelor's and master's degrees there. Mascarenhas completed her graduate studies at Loyola University in Chicago under the mentorship of Professor Dali Liu, earning a PhD in chemistry and biochemistry in 2017. "Towards the end of my graduate school career, I was certain that I would pursue an academic research career and that I would continue studying protein function and mechanisms at the molecular level" Mascarenhas says.

Mascarenhas then joined Professor Ruma Banerjee's laboratory at the University of Michigan as an American Heart Association postdoctoral fellow. "My postdoctoral research was primarily focused on addressing how vitamin B₁₂ is delivered to two target enzymes and elucidating the roles of the chaperone proteins in this process."

At the UO Mascarenhas is leading an interdisciplinary group that integrates structural biology, biophysical, and biochemical techniques to understand how B₁₂ acquisition shapes the composition and metabolism of gut bacteria. This work is currently supported by a Pathway to Independence K99/R00 award by the National Institutes of Health.

Mascarenhas is excited to join the UO due to its collaborative environment and interdisciplinary relationships, as well as the strong focus on microbiome research at the Institute of Molecular Biology (IMB). "My expertise is in biochemistry and structural biology, but the university has many outstanding research groups with a microbiology focus," she says. "I realized that by starting my independent career here, I could form synergistic collaborations with other research labs." Welcome, Romila!

Teresa Rapp

The department welcomed Assistant Professor **Teresa Rapp** to the faculty in September 2023. A native Californian, Rapp loves the gray weather and rain of the Pacific Northwest, but also appreciates Eugene's sunnier disposition in the summertime.

Rapp began her educational career at Ventura College taking chemistry classes as a prerequisite for a biology degree, but after two years she decided to pursue a career in teaching chemistry to the next generation. She finished her BS in chemistry at Cal Poly San Luis Obispo, graduating cum laude in 2012. From there, Rapp moved to the University of Pennsylvania for her PhD studies, where she discovered her research passion: photocleavable ruthenium compounds and the brave new world of biomaterials and tissue engineering. This drew her to a postdoc in bioengineering at the University of Washington with Professor Cole DeForest, a rising star in the field of dynamic biomaterials. In Seattle Rapp demonstrated the potential of the application of ruthenium photochemistry in biomaterials synthesis and discovered her love for the PNW.

Rapp's lab works in the general areas of bioinorganic chemistry, chemical biology, and biomaterials, applying ruthenium photochemistry to a wide variety of challenges in biology and biochemistry. Outside the lab, Rapp enjoys baking for her group, camping and hiking on the Oregon Coast, and hosting colleagues at her home for afternoon tea and backyard campfires. In the nine months since starting her position, Rapp says that she has found joy in mentoring many undergraduate researchers, as well as PhD students and master's interns who make up the first generation of Rapp Lab trainees. Welcome, Teresa! ■



ROMILA MASCARENHAS



TERESA RAPP

Faculty Awards and Honors

JULIA WIDOM



Julia Widom Receives Grant for RNA Studies

Assistant Professor **Julia Widom** received a new five-year, \$1.8 million Maximizing Investigators' Research Award from the National Institutes of Health (NIH). Widom's lab studies RNA structure and dynamics. Widom is developing a new technique that uses single-molecule measurements to monitor the structure of RNA molecules as they transition between different structures and interact with proteins. It is a challenge to relate the sequences of RNAs to their dynamic properties. To maximize information from these experiments, Widom measures the properties of multiple different RNA molecules at once, and then sequences the individual RNAs to match their properties to their sequence. This technique will greatly accelerate understanding and design of RNAs with desired properties. Her work could have a significant future impact on mRNA vaccines such as those used by Pfizer and Moderna for COVID. The NIH grant is geared toward early-career researchers, to give them stability to increase the chances of important breakthroughs. Widom earned her PhD at the UO in 2013 with Professor Andy Marcus. From 2014 to 2018, she worked as a postdoc in the lab of Nils Walter at the University of Michigan. She returned to the UO as a faculty member in September 2018.

CHRIS HENDON



AMANDA COOK



MIKE PLUTH



SHANNON BOETTCHER



PAUL KEMPLER



Hendon and Cook Earn Early-career NSF Awards

Two chemistry faculty members, Associate Professor **Christopher Hendon** and Assistant Professor **Amanda Cook**, received awards from the National Science Foundation's Faculty Early Career Development Program (CAREER). This is a highly competitive national award that will fund their research for the next five years. Cook is developing new organometallic catalysts and furthering understanding of the mechanisms of chemical reactions, leading to a better understanding of how to make the catalysts

even more effective. Hendon's research in computational chemistry seeks to convert solar energy into an energy source to make and break bonds with CO₂ leading to renewable solar fuel while reducing environmentally problematic gases. Cook and Hendon were hired in 2018 and 2017, respectively, through the University of Oregon's Energy and Sustainable Materials Initiative.

Mike Pluth Awarded Rare NSF Special Creativity Award

Professor **Mike Pluth** was awarded a Special Creativity Award from the NSF for his project entitled Bio(in)organic Chemistry of Reactive Sulfur and Selenium Species. This award is initiated by program officers at NSF and is only offered to exceptionally creative and productive investigators. The award is provided as a supplement that extends a current grant, and is an opportunity to pursue adventurous, "high-risk" opportunities in the same general research area, but not necessarily covered by the original proposal.

Kempler and Boettcher Earn 2023 Campus Sustainability Awards

Shannon Boettcher and **Paul Kempler** both received a UO Campus Sustainability Award, which celebrates sustainability in research, teaching, campus operations, and more. The award, launched in 2015, is sponsored by the Office of the Vice President for Research and Innovation. The Office of Sustainability manages the awards program and hosts an annual ceremony to celebrate the winners. Winners also receive a video showcasing their contributions. Boettcher was the founding director of the Oregon Center for Electrochemistry and was at the UO from 2010 to 2023. He transitioned his lab to UC Berkeley and LBNL in early 2024. Kempler is transitioning to a tenure-track assistant professor position at the UO in fall 2024 and

is the associate director for the Oregon Center for Electrochemistry. Both use electrochemistry to increase battery efficiency and to drive industrial decarbonization.

Chris Hendon Promoted to Associate Professor

Chris Hendon, a computational materials chemist and an international expert on the science of coffee, also known as “Dr. Coffee,” was promoted to associate professor with tenure in fall 2023. As part of the University of Oregon’s Energy and Sustainable Materials Initiative, Hendon studies material properties that emerge from chemical imperfections, work that is helping to develop new energy storage technologies. Separately, Hendon’s studies on coffee focus on isolating critical variables in producing reproducibly tasty coffee, while minimizing waste (see page 10). Students can enjoy his “coffee lab” in the cafe area of Willamette Hall.

Guenza Lab Research on Cover of *The Journal of Physical Chemistry B*

The cover of the December 2023 issue of *The Journal of Physical Chemistry B* featured research done by the lab of **Marina Guenza**. Guenza is a fellow of the American Association for the Advancement of Science and of the American Physical Society who has been at the UO since 1998. Her research focuses on developing theories for the coarse-grained structure, thermodynamics, and dynamics of synthetic polymer systems and biological macromolecules. View the article at pubs.acs.org/toc/jpcb/fk/128/5.

New Materials Science Institute Director takes the reins

Professor **Ramesh Jasti** became the new director of the Materials Science Institute (MSI) beginning July 2024. Jasti has been an



MSI member since joining the UO faculty in 2014. He takes over the position from Darren Johnson, who was MSI director from 2018–24. Jasti says he “is excited to further expand our already strong program here, which intersects with chemistry, physics, bioengineering, and biology.”

Scott Hansen Promoted to Associate Professor

Scott Hansen, a biochemist and member of the Institute of Molecular Biology, has been promoted to associate professor with tenure effective fall 2024. Hansen’s research is aimed at defining the molecular details of membrane signaling events. His program uses an interdisciplinary approach including biochemistry, quantitative cell biology, material science, and theory. A current research direction is focused on the mechanisms controlling spatial patterning of PIP lipids in eukaryotic cell polarity. Hansen also cofounded the unique ArtSci Oregon group that promotes UO research using aesthetics to engage the community in science. Hansen has been at the UO since 2017. ■

Chris Hendon, aka “Dr. Coffee,” hard at work in the coffee lab.



MARINA GUENZA

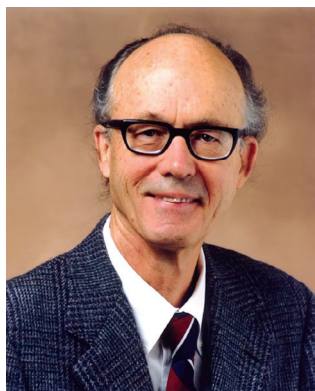


RAMESH JASTI



SCOTT HANSEN

News Briefs



Harden McConnell

Photo courtesy
The Welch Foundation

Inaugural McConnell Lectureship

The McConnell Lectureship was made possible by an endowed fund set up by **O. Hayes Griffith**, emeritus professor of biophysical chemistry and molecular biology, to honor his PhD advisor, Harden McConnell, who was first at Caltech when Griffith was a grad student. They moved together to Stanford. Griffith retired in 2004 after 39 years at the UO. “McConnell is a famous, iconic figure in physical chemistry,” notes Professor **Andy Marcus**, who, as the physical chemistry division spokesperson, has the honor to coordinate the lectures. Harden McConnell died at his home in Atherton, California, on October 8, 2014, at the age of 87. He left a website (<https://web.archive.org/web/20150416145718/http://www.hardenmcconnell.org/>) describing his life and work in the form of a scientific memoir.

The first McConnell Lecture, given by Professor Ken Dill of Stony Brook University, was held in fall 2023 after a delayed launch caused by the COVID years. “Harden McConnell was famous for developing many concepts in biophysics and in what we call experimental approaches for biophysics,” explains Marcus, “and Ken Dill is a very famous theoretical biophysics professor who did his postdoctoral with Nobel laureate Paul Flory, who figured out much of what we know about polymer science.”

Dill spoke to an in-person audience with a large attendance of graduate students, along with many people attending by Zoom, including Hayes Griffith and Harden McConnell’s widow, Sophia McConnell. Future lectures will be held as funding allows. ■

In the Words of O. Hayes Griffith, Emeritus Professor

March 29, 2024

Why establish the Harden and Sophia McConnell Lectureship Funds at the University of Oregon? I was part of the McConnell group as a graduate student at Caltech from 1960 to 1964, and then again as a National Academy of Sciences National Research Council postdoc with McConnell and others at Stanford in 1965. (I joined the faculty at the UO in January 1966 as an assistant professor in chemistry). McConnell and I had a sometimes stormy but always productive relationship in science, and it grew into a close personal relationship over the years.

Soon after Harden McConnell died in 2014 at age 87, my wife, Karen Griffith-Hedberg, and I decided to start a lectureship fund in his honor. We had already established a Harden and Sophia McConnell Endowed Chair fund and a separate Harden and Sophia McConnell Endowed Graduate Student Fellowship

fund in 2000. These will need time to grow at the UO Foundation by reinvesting earnings for decades, we estimate until 2050 for the graduate student fund and 2070 for the faculty support. However, we wanted something that would start much sooner rather than later to keep the collective memory of McConnell and his accomplishments alive—specifically, to bring speakers to campus who stimulate research at the UO and demonstrate that rigorous physical chemistry methods can be helpful in all areas of chemistry, including molecular biology, immunology, and medicine.

The McConnell lecture series also honors Sophia, whose love and cheerful support were essential to Harden’s success. Sophia and her daughter Jane have connections to Oregon. Jane was an English major at Stanford who then came to Oregon and took chemistry and biology classes,

launching her career in science. Sophia is alive and mentally sharp today at age 99. We are grateful to Sophia for contributing to these endowments.

Jane and I both watched, via Zoom, the first UO McConnell lecture, given by Ken Dill. It was exciting! My generation stressed making stable chemical compounds for society, many lingering after their useful life and polluting our environment. Ken Dill highlighted the need for less stable reactions that could result in a Darwinian process whereby molecules (e.g., polypeptides) would be generated and rapidly disassembled and reassembled in different ways to yield “survival of the fittest” intermediates needed to produce life in a test tube for the first time. Exciting ideas that change the way we think! Harden McConnell would have been delighted with this first lecture in the series. ■

Commencement 2024

Spring Graduation Held June 16, 2024

The 2024 chemistry and biochemistry commencement ceremony was held on June 16 in the Paul Olum Atrium of Willamette Hall. The ceremony honored 41 undergraduate degrees, 13 with university or department honors and several with additional department awards. Also celebrated were 21 PhD students, and a total of 70 master's students from five programs (including electrochemistry and advanced materials and characterization, as well as Knight Campus Internship programs in biotechnology, polymers, or semiconductors). Around 70 percent of chemistry and biochemistry undergraduates participate in research laboratories during their time at the UO. Congratulations to our graduates! ■



Thomas and Lindsey Marriott Undergraduate Research Support Fund

Tom Marriott, a 1974 PhD graduate of the Department of Chemistry, continues to be interested in supporting the department and its students. Tom, who received his PhD from the lab of Hayes Griffith, had a long career in the pharmaceutical industry and is a member of the College of Arts and Sciences advisory board. Tom and his wife, Lindsey Marriott (who was enrolled as an MS summer student at the UO in physical education before the couple moved away) have created an undergraduate research endowment and also a Charitable Remainder Unitrust which will fund a graduate student endowment. The newly endowed Thomas and Lindsey Marriott Undergraduate Research Support Fund will replace the currently expendable fund bearing the same name, which provides research support to undergraduate students enrolled as majors in the Department of Chemistry and Biochemistry and/or the Department of Biology at the University of Oregon. Students may use the funds for living expenses, conferences/meetings, travel, materials, supplies, equipment, and other miscellaneous expenses associated with undergraduate research. ■



Funds that Support the Department

Chemistry Achievement Endowment Fund General support fund to help address the highest needs of the department.

Chemistry Graduate Student Scholarship Support Fund Scholarships for graduate students that may be used for any educational expenses.

Gary and Patricia Hedden Instructional Fund Support for undergraduate peer learning assistants in organic chemistry.

News Briefs



Christopher Hendon, contemplating ways to eliminate flavor-robbing microclumps.

PAUL KEMPLER



RAAMESH JASTI



Hendon Leads Effort to Extract the Essence of Espresso

Associate Professor **Christopher Hendon** is leading a four-year project on espresso extraction launched by the Coffee Science Foundation, with support from Nuovo Simonelli, an Italian coffee machine manufacturer. Over the four years of this research, Hendon and his partners at Oregon State University and the UK's University of Portsmouth will develop a new method to measure the composition of coffee extracts. Hendon recently published research in the December 6, 2023, issue of the journal *Matter*, asserting that adding water to coffee beans eliminates flavor-robbing microclumps. His work has led to several avenues to reduce coffee waste, leading to a potential industrial saving of \$1.1 billion per year.

Kempler Receives DOE Funding for New Method to Produce Steel

Paul Kempler, an assistant professor and the associate director for the Oregon Center for Electrochemistry, uses electrochemistry to study a variety of processes involving energy and decarbonization. His team recently developed a way to make iron metal for steel production without burning fossil fuels. Kempler received \$730,000 in new funding from the US Department of Energy to further advance the green process. The method uses cheap and abundant saltwater and iron oxide to produce pure iron metal. At scale, the process could eliminate the carbon-emitting gas furnaces that are currently used in industrial steel manufacturing. Kempler and his team published their findings in the February 2024 issue of the journal *Joule*. The global demand for steel (e.g., 2 billion metric tons in 2022) makes processing iron ore one of the most industrial intensive methods to use fossil fuels. Kempler says that decarbonizing the step of converting iron ore to pure iron would reduce greenhouse gas emissions as much as converting every gas vehicle on the roads to electric. Kempler's research is focused on finding cost-effective and efficient methods that are robust enough to compete with traditional methods on an industrial scale. The lab has filed a patent for its new process, and the team is collaborating with the National Energy Technology Laboratory to confirm that the iron generated from the reactions can indeed be used in steel. In collaboration with Associate Professor Erica Fischer at Oregon State University and the electrochemical company De Nora, Kempler's team hopes to improve the electrodes and make the electrochemical process work with lower-quality iron ores that are abundant and easy to source.

Jasti Lab Develops Interlocked Nanomaterials

The lab of **Ramesh Jasti**, a professor of chemistry at UO since 2014, has created new carbon-based molecules with interlocking rings. The properties of these molecules can be "tuned" by changing their size and chemical makeup. This adjustable quality makes them potentially useful for an array of applications, such as specialized sensors and new kinds of flexible electronics or dynamic biomedical materials. James May, a former graduate student in Jasti's lab and the first author on the paper, revealed their findings in a paper published January 2023 in the journal *Nature Chemistry*. The method of creating this material allows carbon nanotube-like structures to be interlocked together, which allows for many different variations on the structure. The team created a circular structure of three interlocked rings, as well as a rod-like structure with multiple rings that can slide up and down. The novel chemistry involves forcing a chemical reaction to occur inside one ring to make a second ring interlocked inside the first one.

I3 Awards Fund Immune System Evolution, Literacy, Chronic Stress Research

The UO's Incubating Interdisciplinary Initiatives (I3) awards provide up to \$50,000 to seed new interdisciplinary research. In 2023, one of three awards went to biochemistry Associate Professor **Mike Harms**, along with Associate Professor **Matthew Barber** and Assistant Professor **Melanie Spero**, both with the UO's Department of Biology. Their project, "Origin and Evolution of Immune Protein Functions," investigates the origin and diversification of lactoferrin, a mammalian immune protein with a range of defensive and anti-inflammatory properties. The team's long-term goal is to fundamentally advance understanding of immune system evolution, as well as inform the design of new therapeutic proteins. Harms has been an associate professor in the Department of Chemistry and Biochemistry since 2013.

UO SACNAS Chapter Sends Over 70 Scientists to Meeting in Portland

In October 2023, SACNAS (uosacnas.uoregon.edu), the Society for Advancement of Chicanos/Hispanics and Native Americans in Science, celebrated its 50th anniversary at a STEM conference in Portland. Local UO SACNAS chapter president and executive board member **Harrison Reid**, a PhD student with Professor Ramesh Jasti, worked with chapter faculty advisor Jim Prell and other colleagues to support a huge contingent of more than 70 undergraduate, graduate, and other representatives from the UO to attend the 2023 meeting. The largest event of its kind in the US, the annual National Diversity in STEM conference, or NDiSTEM, supports underrepresented groups in science, technology, engineering, and math. SACNAS has more than 10,000 members and 144 student and professional chapters in the US. The October gathering was the first national meeting held in Oregon since the UO started a SACNAS chapter in 2014. Some UO student attendees presented research posters. Others networked with students and faculty from universities across the country and explored job opportunities with scientists from corporations and research institutions. The intent of both SACNAS and NDiSTEM is to celebrate the diversity of the sciences and encourage budding scientists.

Alum Turns a Doctorate Into Dance to Win "Dance Your PhD" Contest

Chemistry PhD student **Checkers Marshall** used the medium of dance to explain their research and win the 2023 Dance Your PhD competition, which challenges graduate students to create videos explaining research through creative movement. Marshall's video on their doctoral subject—metal organic frameworks (MOFs)—beat out 27 other submissions from around the world. Working in the lab of Assistant Professor Carl Brozek, Marshall helped develop ways to make MOF nanoparticles, which could eventually be useful for applications such as pulling carbon out of the atmosphere or removing lead from drinking water. Marshall has been practicing flow arts—a movement-based art that includes juggling, staff spinning, and fire dancing—since high school. Marshall received their UO doctoral degree in December 2022 and now works for Svante, a company in Vancouver, British Columbia, that makes metal organic framework nanomaterials for carbon capture. ■



MARK HARMS



HARRISON REID



CHECKERS MARSHALL

Keep In Touch

We often do not know about the distinguished careers of our alumni until they share information with the department to publish in the newsletter's Alumni News From All Over section. Over time, as faculty leave or retire, we lose awareness of previous generations of alumni. You can help us by telling us about your career or of former students that you know. Email us at chem@uoregon.edu.
Thank you!

Alumni News From All Over

2020s

Matthew Stevens BS biochemistry '20 says that after graduating, he married “an amazing woman,” Haley, and they both stayed in Eugene with their cat, Sophia. After a short stint at Thermo Fisher as a lab technician, Stevens says he realized the scientist career track wasn't for him, so he pivoted to a career in tech and is now employed as a data engineer at S&S Truck Parts. “Remote work for the win!” he says. In the future he and Haley plan to buy a house in Hawaii.

2010s

Nichole Rogovoy BS '18 (Honors College), graduated from medical school in 2023 from Oregon Health and Science University and matched into residency at Dartmouth as an internal medicine physician. Rogovoy is on her way to becoming a cardiologist, happily living in New Hampshire, and working on research in atrial fibrillation.

2000s

Aleena Garner BS Biochemistry '07 is assistant professor in the Department of Neurobiology at Harvard Medical School. She recently returned to Eugene to give a seminar to the UO Women in Graduate Sciences group.

Brian Truong BA Biochemistry '07 (Honors College) is now an anesthesiologist with Oregon Anesthesiology Group (OAG) at Legacy Health in Portland and Vancouver. In his spare time, he plays pickleball and tennis, tries new restaurants, travels the world, and spends time with his family and friends, including his Maltese pup named Matcha.

Ben Wiggins BS Biochemistry '03 (Honors College) is now a full professor of biology at Shoreline Community College.

1990s

Melissa Holtz PhD '95 provided technical support for flow cytometry research, instruments, and reagents at Thermo Fisher Scientific in Eugene after doing leukemia research at the City of Hope for 10 years. Holtz is now retired and enjoying life.

1980s

David Schiraldi PhD '82 retired in 2020 from the faculty of Case Western Reserve University. He now holds the position of Peter A. Asseff Professor Emeritus, and still works in support of students as needed. The rest of his time is filled with hiking, fine wines, and family.

Steven Vik PhD '80 says he greatly appreciates the education he received at the University of Oregon. After his PhD, he went on to two postdoc positions at Scripps and Stanford. In between, he spent a year at the Academy of Sciences in Beijing, having studied Mandarin Chinese for one year at the UO. In 1987 Vik started a faculty position at Southern Methodist University in Dallas, Texas. “I soon befriended a retired chemistry professor who immediately asked if I knew Tom Koenig, who had been a football player at SMU, and later became a faculty member at Oregon,” Vik notes. Vik maintained an active research lab at SMU, studying the structure, function, and assembly of two *E. coli* enzymes: ATP synthase and Complex I, both involved in oxidative phosphorylation. Vik also designed the biochemistry major at SMU and served as advisor for nearly 30 years. “That was by far my favorite service activity,” he says. “I retired after 35 years in 2022, and moved to Taos, New Mexico, with my wife. In Taos we can now view the mountains from our eastern windows. The only other time I had such a view was from the second floor labs of Science II in Eugene!”

Richard Ludescher PhD '84 reports that he recently retired after 34 years in the Department of Food Science at Rutgers University as a full professor, teaching and doing research into the physical chemistry of food. During his tenure in the department, he served as undergraduate and then graduate program director for many years. He also had the “pleasure and honor” of serving as Dean of Academic Programs for the School of Environmental and Biological Sciences at Rutgers for seven years, from 2011 to 2018. “I had the pleasure of mentoring nearly three dozen MS and PhD students, published over 100 peer-reviewed publications, and volunteered as advisor to both the undergraduate and the graduate food science student clubs for several decades,” Ludescher says. After retiring in July 2022 he has remained active by auditing art history courses at Rutgers, gardening, traveling with his wife, and “reading voraciously” on the history of science, art, and culture. Ludescher received more than a dozen teaching and education awards at the department, college/school, university, national, and international levels while at Rutgers. He graduated in 1984 after doing his PhD work under the supervision of Bruce Hudson. As a side note, Ludescher welcomes the UO to the Big 10!

1970s

Aminu Mohammed Dorayi PhD '73 is now 84 years old, with a wife, eight children, and nine grandchildren. He says he is quite healthy and enjoys reading and guiding his children, grandchildren, and others. He enjoys thinking about his past, including studying under Professor Donald Swineheart at UO, and published his autobiography titled *Chronicles of An Adventurous Chemist* [Editor's Note: He provided a copy to the department following its publication in 2019]. Aminu is serving the Ahmadu Bello University, his alma mater, as a board of trustees member of the Distance Learning Center for a term of four years. This

involves a quarterly meeting with the university president, the registrar, the bursar, and some top deans and directors to review and guide the academic programs of the center.

Wesley Hoenshell BA '74 attended medical school in Portland, Oregon. He is married with four children and lives in Redlands, California. Hoenshell retired three years ago from a family medicine and acupuncture practice.

Bradford Wright BA '79 (Honors College) retired from 3M Company and is now spending his time volunteering and composing music.

1960s

William D. Brewer BA Chemistry '65 (Honors College), has published two books, both scientific biographies (shorturl.at/IMOV7). One is on the Brazilian physicist Jayme Tiomno (2020, with Alfredo Tolmasquim), the second on the mathematical genius Kurt Gödel (2022, German edition 2024). Brewer is currently working on transcribing and translating Albert Einstein's papers for Caltech's Einstein Papers Project (einstein.caltech.edu). Get in touch with Brewer at userpage.physik.fu-berlin.de/~wbrewer/index.html.

Gordon W. Gribble PhD '67 recently published his third volume of *Naturally Occurring Organohalogen Compounds* (Springer; Vol 121, 2023), which documents an additional 3,200 examples since the first two compilations in this trilogy, bringing the total of such natural products to nearly 8,000 compounds that contain either chlorine, bromine, or both. Other compounds, though not as many, contain iodine or fluorine.

Wayne Stalick BA '64 was honored in December 2023 at a special luncheon with a certificate of recognition for 60 years of service to the American Chemical Society. ■



In Memoriam: John E. Baldwin (1937–2024)

John E. Baldwin passed away in May 2024. Baldwin was a UO faculty member in the chemistry department from 1968–1984, including serving five years as Dean of the UO College of Arts and Sciences. He moved to Syracuse University in 1984. Professor Baldwin was a physical organic chemist and pioneer in the use of density functional theory and other emerging quantum calculations to gain insights into chemical bonding and reaction mechanisms. He was the recipient of the 2010 James Flack Norris Award. More about Professor Baldwin's distinguished career: cas.uoregon.edu/remembering-longtime-faculty-member-and-former-dean-john-e-baldwin and huffandlakjer.com/obituary/john-baldwin.

Student Awards

NSF Graduate Research Fellowships

The National Science Foundation Graduate Research Fellowship (NSF-GRF) is a highly competitive award that supports outstanding students pursuing STEM-field research-based graduate degrees. In the 2023 competition **Gaby Bailey**, a chemistry PhD student in the Jasti lab, was awarded this honor and **Allison LaSalvia**, a PhD student in the Cook lab, was named NSF-GRF awardee in 2024. Recipients of the NSF-GRF receive an annual stipend of \$34,000 for three years as well as access to opportunities for professional development. In addition, the fellowship

provides the UO with a \$12,000 cost of education allowance for tuition and fees. PhD students **Katelyn Alley** (DeRose lab) and **Monique Demuth** (Rapp lab) were awarded honorable mentions in the 2023 and 2024 competitions, respectively.

Duewell and Chisholm Receive Keana Fellowship

Graduate students **Benjamin Duewell** and **Lauren Chisholm** were named as the department's 2023–24 John Keana Fellows. The Keana Fellowship, established in 2017 from a generous donation made in honor of Professor Emeritus John Keana, provides annual fellowship awards to graduate

chemistry and biochemistry students at the University of Oregon. Duewell received his BS from the University of California-Irvine. He came to the UO for a PhD with an interest in biosensors and joined the laboratory of Scott Hansen in 2020. Duewell is coauthor on four manuscripts from his PhD work on the biochemistry and biophysics of membrane lipid signaling. Chisholm received an undergraduate degree from University of Wisconsin-Madison. She worked in biotechnology and for the USDA before joining the UO, where she is pursuing a PhD in the laboratory of Mike Harms. Her research is on the evolution and biochemistry of proteins involved in inflammation.

Six Undergraduate Scholarships awarded in 2023

The Chemistry and Biochemistry Department is lucky to have several undergraduate scholarships available through the generosity of alumni donors. The following scholarships were awarded in 2023.

Nadia Barnard

Anita and Friedhelm Baitis Scholarship

Nadia performed research in the laboratory of Shannon Boettcher, and after graduation is joining the electrochemistry master's program to continue research on renewable energy.

Mayurika Bhaskar

Percy Julian Scholarship

Mayurika, a Clark Honors College student, performed research in the Knight Campus Ambati laboratory with plans to pursue medical school after graduation.

Ethan Busi

Faith Van Nice Scholarship

Ethan, a Clark Honors College student, performs undergraduate research in the Hansen laboratory, and plans to pursue medical school after graduation.

Nick Frainey

Anita and Friedhelm Baitis Scholarship

Nick did his research in the Wong laboratory and is joining the PhD program in physical chemistry at UC-Irvine. At the 2024 graduation, Nick was also awarded the American Institute of Chemists Foundation award, the highest honor given to UO chemistry and biochemistry undergraduates.

Michaela Cheechov

P-Chem Summer Research Fellowship

Michaela is a physics major and pursued research in the Guenza laboratory, using molecular dynamics computer simulations to simulate protein dynamics.

Logan Russo

Kuntz-Swinehart Memorial Scholarship

Logan has been performing research in the Wong laboratory since his freshman year, investigating the physical chemistry of perovskites. ■

More about the 2023 awardees and these valuable scholarships can be found at blogs.uoregon.edu/chemdeptblog/category/scholarships

Honor Roll

Chemistry Gifts, July 1, 2022, to December 31, 2023

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New Catalyst Enrichment and Retention Programs

The new Catalyst Summer Bridge enrichment and retention opportunity for chemistry undergraduate students stems from the UO Summer Bridge program (summerbridge.uoregon.edu). This program brings first-year students to the university early to become acquainted with the campus through welcoming events. The Summer Bridge program has had opportunities for different areas of interest, including physics and business. Last summer Ramesh Jasti, a professor of organic chemistry at the UO since 2014, was approached about creating a program for incoming freshmen interested in chemistry. “We developed this program, which is totally funded by the state of Oregon,” says Jasti. “We brought in about 40 undergraduate students 11 days before classes started and provided them with tutorial sessions to help them.”

The Catalyst program students used one of the department’s teaching labs to perform experiments. “They worked



Catalyst students learned about resources on campus, made connections with other students, and explored how chemistry connects with many fields of interest.

together in groups of two or three people and ran through three areas of interest for chemistry—sustainability and energy, human health, and materials,” says Jasti. “I wanted to show them that chemistry is a good major if you’re interested in energy sciences or the environment, and that chemistry connects to so many other fields, and so many potential careers.”

The students got to meet faculty and go to a Ducks football game, plus additional activities such as movies and bowling. “We want them to know each other, so when they come to

college, they feel like they have some connection to each other,” Jasti says. The Catalyst program came together rapidly with the help of nine graduate students who worked with the incoming undergraduates. Jasti hopes that as these participants move through their next few years of college, they will do better thanks to having this early connection to the university community.

“These kinds of programs have the potential to attract a more diverse group into the chemistry department, and that’s our goal,” says Jasti. ■