CAS
COLLEGE OF ARTS + SCIENCES
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY
FALL 2016

Renovated Science Library Opens

Science students of years past will remember the cave-like feel of the old science library. Originally built in 1969, it was expanded in the 1990s to eventually span the basements of Onyx Bridge and Klamath, Willamette, and Cascade Halls. It was hard to find with only one above-ground entrance at the east end of Onyx Bridge, and there were few group study spaces. That's all changed as the $16.75 million two-story Allan Price Science Commons and Research Library opened to students in July. The grand opening took place October 6. Gifts and state bonds funded the much-needed remodel project. The largest gift, $8 million, came from generous UO benefactor Lorry I. Lokey, who requested that the building be named for Allan Price, the former UO vice president for advancement, who died unexpectedly in 2012 at age 56.

"The seating capacity for the PSC has approximately doubled, growing from 250 to 500 seats in the renovated and expanded space," says Mark Watson, Associate Dean for Research Services and Interim Head, Science Libraries. "It's more open, friendly, and well-lit. You don't think of it as a dungeon anymore."

Each science department has its own study room for office hours and tutoring. "Each room has locked cabinets to store models, maps, fossils, bones, etc," says Brian Westra, the Lorry I. Lokey Science Data Services Librarian. There is a visualization lab equipped with 24 46-inch panels that can all be used individually or as one large screen. "Both students and faculty can display up to 50 million pixels of data," says Westra. "For example, graduate students can bring in genomic data or other large data sets that are hard to visualize on a small screen." Research Guide Dean Walton notes that the visualization lab is the highest resolution of any wall or video screen in the state of Oregon. The second best is about 30 million pixels. "There's nothing else like it," he says. "This wall may potentially be opened to outside businesses for research that could benefit the university."

Another addition is the MakerSpace, which will have a 3D printer, laser cutter, a vinyl cutter, a soldering station, an industrial sewing machine, digital laser scanner, and a vinyl detail printer for signs and decals, as well as many other tools and electronics. "This will be open to anyone on campus, faculty, staff, and students, and will be particularly interesting to anyone developing their own sensor systems," says Walton. The library also plans to host outside groups like the sport/tech Hackathon, QuackCon.

*See **Renovated Science Library Opens**, page 3*

INSIDE

CHEM+ Chemistry

Initiatives to Improve Diversity in UO Sciences

CATHY WONG

JACLYN KELLON

KARA NELL

The big problems facing society today cross national boundaries and socio-economic barriers. Everyone, whether they are in Saharan Africa or Seattle, Washington, needs clean water, clean air, a clean source of energy, and ample food. Solving those diverse problems requires a diverse team of thinkers, people who can understand that one solution does not fit all cultures or environmental regions.

That's just one of the reasons that supporting diversity in science is important. The university's Division of Equity and Inclusion funds research packages that help foster diversity. **Cathy Wong**, who joined the faculty in August 2015, is funded by this program. Her research is pioneering a new way to study the properties of semiconductor materials as they undergo chemical changes. The results might lead to better solar cells and improved functionality of devices we use every day.

"A diverse collection of people leads to diverse ideas and new ways of looking at problems," Wong stated. "That's why DEI's work is so important. The startup package they helped fund was a big part of my decision to join the UO faculty. These resources helped me hit the ground running with my research, and in a few years I hope to leverage the results to get my own federal funding."

Three graduate students at the University of Oregon have taken steps to help the university and the greater community embrace diversity. **Kara Nell** was an officer with Women in Graduate Science (**pages.uoregon.edu/uowgs)** for the past four years, and sees that students are demanding changes.

"Many of these efforts are driven by students who make it clear that they want improved support in STEM for both gender and racial equality," she says. Nell joined WGS after her first year in grad school. "WGS was fantastic for me," she says. "I started as outreach coordinator for three years and did a lot of outreach with K-12, trying to garner interest in and improve access to STEM, particular for middle school girls from lower socio-economic situations." The UO supports greater opportunities for youth through several programs. In particular, SAIL, or Summer Academy to Inspire Learning, hosts free summer camps for students in 8th through 12th grade. Priority is given to students who qualify for free and reduced lunch programs. Nell began her schooling with the intention of being an environmental lawyer, but was drawn to science because of it's potential to help solve the world's problems.

"I strongly believe that we cannot solve those problems without having a diverse team working on them," says Nell.

Her graduate research focused on materials for water purification in **Darren Johnson**'s lab. She graduated earlier this summer and now is a postdoc in the Bay Area.

Jaclyn Kellon is a graduate researcher in the Hutchison Lab and president of CMiS, a Community for Minorities in STEM (**pages.uoregon.edu/cmis**, and **facebook.com/uocmis**) at the University of Oregon. She's also the UO chapter president of NOBCChE, the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (**nobcche.org**).

"The UO NOBCChE chapter was founded in 2011 and in 2013 it hosted the Western regional meeting," Kellon recalls. "After a year of inactivity, myself and a fellow chemist decided that we wanted to restart the chapter fall 2015, but because of the lack of numbers of black chemists at Oregon we decided to team up with SACNAS (Society for Advancement of Chicanos/Hispanics and Native Americans in Science; (**uosacnas.uoregon.edu**) to target more individuals of color in the UO science community." The NOBCChE/SACNAS collaboration held resume writing workshops, networking events, and informational meetings for undergrads on how to get involved in research. Nonetheless, Kellon realized that NOBCChE/SACNAS did not capture all underrepresented groups as people who did not identify as black, Latino/a or native were not attending meetings and did not feel welcome. "I decided that we should rebrand and create CMiS, to better encompass all ethnic and cultural minorities in STEM fields."

Since then the group has held a social justice panel and round table discussion aimed at giving voice to the lived experiences of faculty and students of color at the UO. "In grad school, whether you're a woman or a minority, but particularly if you're both, it can feel like there's no community to be a part of. That's one of the goals for diversity at the UO —to help everyone feel welcome and supported."

Jobs in STEM fields are some of the fastest growing. Right now, minorities make up about 14 percent of STEM PhDs. In the next 20 to 40 years, demographics will shift to include about 50 percent minorities. "If we want to continue filling the jobs that STEM

fields will require in the future, we need to award more PhDs to individuals of color," she says. "Economically it's necessary. Also, bringing in a diverse group of scholars is going to lead to different ways of thinking about the sciences. It shows a need to diversify in general."

She continues: "One of the biggest criticisms of the UO, and nearly every other school, is that there is a lot of efforts on recruiting individuals of color but very little effort on retaining them once they arrive. One thing I really struggled with, and I know other people of color also did, was once in Eugene I really felt like an outsider. I moved here from Baltimore and I had never felt like such an 'other' as I did when I got here. Either no one looks like me or people stare. Everyone's nice but there's a ton of micro-aggressions." She wants to see increased effort not only on recruitment but also on retention, by making the UO a place where people who do not necessarily fit in physically can still thrive and not want to leave.

This year Kellon won a $5000 Karfilis Leadership Award, established by the parents of Kate Karfilis, who graduated with her PhD in biology this summer. This award recognizes graduate students 'who have demonstrated strong dedication to the mission of the professional development of women in all disciplines of science to enable them to become successful contributors to their fields through exemplary leadership' (**pages.uoregon.edu/uowgs/awards.php#leadership**). "Before getting into grad school I didn't appreciate how real the problem of women being underrepresented in science is," Kate Karfilis says. "I thought at the time, it's 2012, we've made so much progress, there are so many undergrad women in my classes there can't really be that much of a problem." When she realized it was still a problem, she became motivated to make a change. "I believed that the best way to do that was to get involved with this group," she recalls. "I've seen this group grow to an active organization of 70+ members and it's been an incredible experience."

"People on campus or in the business community can help by talking about diversity. Just being aware of a lack of diversity is a step in the right direction," Kara Nell says. "Be aware that diversity is something that many people want to improve. The research says if you talk to the hiring committees and make the intentions to promote diversity at the university known, then you can wipe out a lot of that implicit bias that people tend to carry with them. By acknowledging that you probably have implicit bias, you can then say, 'Let's work through it'." ■

Renovated Science Library Opens

Continued from page 1

"We'll feature workshops on making seismometers to measure earthquakes, constructing bat detectors, and putting together Arduino circuit kits," says Watson.

"We expect the MakerSpace to be busy." Overall, 4,000 square feet of space was added upstairs at ground level, with a grand staircase descending into the library space. The new circulation and computer help desk is located where the stacks used to be. The wall between the library and the Klamath computer lab was removed. A coffee/snack bar, called Elements CaFe, is located upstairs in the Social Commons, overlooking the plaza. Westra says there are plans to hold public events related to science in that space.

To make room, the librarians had to reduce the print collection by half. What print books the library retained are kept underneath Cascade Hall, and the bound journals were moved into Fenton Hall. "We bought digital backfiles for almost everything that we removed from the collection in order to retain access," says Watson. "If it was in print and we were taking it out, we tried to make sure we got digital files of it."

The students and staff are in agreement that the renovation and expansion project represents a vast improvement. Large glass panels overlook the courtyard, which is now filled with native plants, tables and chairs. All staff and patrons have come to appreciate the natural light afforded by the new layout. Now, whether visitors enter from the ground floor or the courtyard, they are embraced by technology and an open, modern space. ■

Klamath Hall Renovation Planning Now Underway

While the chemistry and biochemistry classrooms and teaching labs along with interdisciplinary research facilities have been significantly improved in recent years, some parts of Klamath Hall have remained essentially the same since they were built in the mid-1960s.

That's about to change as the department has received funding to renovate the outdated third floor laboratories and lecture spaces in Klamath Hall. Mike Haley, the Richard M. & Patricia H. Noyes Professor of Chemistry, wrote the successful proposal to modernize the space. "Renovation of the synthetic labs was my biggest unfulfilled goal when I stepped down as Department Head in 2014. Not anymore—I am thrilled that this long-overdue upgrade is going to really happen!" says Haley.

In the lab of Ramesh Jasti, graduate student Jeff VanRaden works up a reaction in one of the antiquated fume hoods.

The $18.65 million project was approved in late September 2015 by the UO's Board of Trustees. Construction is expected to start in summer of 2018 and be complete by 2020. Plans call for renovating the third floor of the 50-year-old building and topping it with a new, partial fourth floor. Existing lab and office space will be rebuilt to modern, cutting-edge standards. "Right now we are in the planning stages to see just exactly what we can and cannot do within the budget. Hopefully by the beginning of 2017 we will have retained an architectural firm so that the really detailed planning can begin," says Haley.

Klamath Hall's current configuration has students working in cramped labs with back-to-back bench space. Lines of sight from workspaces to blackboards where professors and students discuss procedures are often obscured. Because students are working in close proximity with their backs to each other, safety is a concern.

Darren Johnson is one of the professors whose lab will be improved by the new plan. "Tackling the big, important problems facing society now requires large, diverse, high-functioning teams of researchers interacting on a regular basis," he says. "The Klamath remodel will convert the existing dated, traditional lab space to accommodate flexible, nimble research teams that can respond to emerging problems and accelerate impact from our department's basic science discoveries."

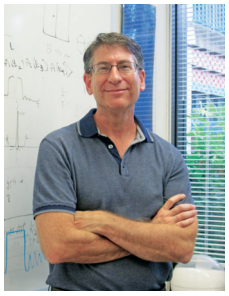
In recent years, the UO administration has set goals to build upon the strengths and successes of the current programs, and the Klamath remodel is a vital part of this plan. Associate Professor Ramesh Jasti, who joined the UO faculty in July 2014, believes that the third floor remodel is critical to the future success of the chemistry department. "Currently, we have one of the best programs in organic and inorganic materials chemistry in the country and it's getting stronger every year," he says. "But our laboratory facilities in Klamath Hall are woefully outdated. The third floor renovations will provide state-of-the-art laboratories to help us recruit the very brightest graduate students, as well as the most talented faculty."

As part of the plan, all of the existing wet and dry lab space and office space on the third floor will be gutted and rebuilt. Exhaust hoods and other equipment will be replaced, and the research labs will be configured in a modular design for maximum flexibility as needs change. The new fourth floor will house faculty and student offices, study spaces and conference rooms, and a new 80-student classroom to replace a similar but outdated classroom on the current third floor.

The total amount of renovated space is approximately 17,000 square feet and new space totals more than 6,000 square feet. "The Klamath remodel is needed to modernize the research space and provide a safe working environment for undergraduate and graduate researchers studying in labs that focus on synthetic chemistry," says Mike Pluth, another faculty member with space on the third floor. Since the mid-2000s, the department's undergraduate enrollment has increased more than 30 percent, while graduate student enrollment has risen about 20 percent in that same time period. ■

"These renovations will provide our students with a significantly better training environment to prepare them for their future careers," says Mike Pluth, a chemistry associate professor with space on the third floor.

Department Head's Perspective



ANDY MARCUS

It is a pleasure to introduce this newsletter, which reports the continuing upward trend of accomplishments the Department of Chemistry and Biochemistry has experienced in recent years.

This year's news ranges from individual faculty and student awards, tributes to distinguished alumni, the introduction of new faculty lines, and the recent completion of and progress toward newly renovated research and learning spaces.

In October, the UO announced a remarkable and generous gift of $500 million from Penny and Phil Knight to build the new Knight Campus for Accelerating Scientific Impact (**around.uoregon.edu/accelerate**). This gift will likely have a transformative effect on the university as a whole, and will certainly affect the department in positive ways. More on this in the next newsletter.

As in previous years, here we acknowledge several members of our faculty for their professional achievements. In particular, I'd like to congratulate professors Shannon Boettcher, Michael Pluth, Mark Lonergan, and Darren Johnson for their well-earned recognition by the university for their research and scholarship. I also want to congratulate professors Darren Johnson and Michael Haley for their excellent entrepreneurial work developing their startup company, SupraSensor Technologies.

We now have a newly renovated science library, which is a beautiful and inviting space for students, faculty, and staff members to work and study. I am happy to report that planning for the renovation of synthetic laboratory space on the third floor of Klamath Hall continues to move forward. This project will bring state-of-the-art synthetic research laboratories and student workspaces to the department.

On a parting note, I would like to mention that this is a period of intense activity and challenges, as the university strives to elevate its international stature, while also responding to changing socioeconomic conditions. President Schill has articulated goals for the university, which prioritize research excellence (**president.uoregon.edu/open-mike-defining-excellence**) and a growing emphasis on the quality of academic opportunities we provide to our students. During the coming year, we will be running searches for three new research professor positions, two of which represent new faculty lines within the department. In addition, we have also introduced a new "trailing sequence" to our general chemistry lecture and laboratory course curriculum, which we believe will be of direct benefit to the continuing success of our undergraduates. These are just a few examples of the exceptional work that our faculty, staff, and students are engaged in.

Best wishes for a pleasant and productive year!

Andy Marcus
Department Head

Faculty Awards

SHANNON BOETTCHER

Shannon Boettcher Receives Faculty Excellence Award

Associate Professor Shannon Boettcher was one of 15 recipients of the 2016-17 Fund for Faculty Excellence Award, which recognizes outstanding UO faculty members. The monetary award lets these outstanding researchers know they are appreciated, and that they help to increase the university's academic quality and reputation. Each recipient receives a $20,000 salary supplement or $25,000 in research funding. The award was made possible by the generous support of Lorry I. Lokey.

MIKE PLUTH

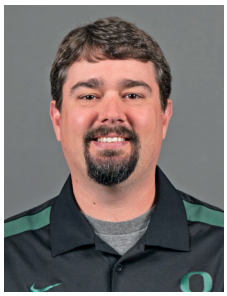
Mike Pluth Recognized as Dreyfus Teacher Scholar; Receives Early Investigator Award from UO VPRI

Associate Professor Michael Pluth was named a Camille Dreyfus Teacher-Scholar for 2016. Pluth says his receipt of the award, which recognizes both research and teaching, will make it easier to try high-risk, high-reward ideas that are not directly tied to federally funded research projects. Camille Dreyfus Teacher-Scholar awards are given to faculty members in the early years of their academic careers, based on their early scholarship and commitment to education. Each recipient receives an unrestricted research grant of $75,000. Pluth is the 11th UO faculty member to receive a Camille Dreyfus Teacher-Scholar award. Pluth, who was promoted to associate professor in September, also last spring received the 2016 Early Career Award from the UO Office of the Vice President of Research and Innovation. This award is granted to tenure-track assistant professors who have demonstrated significant scholarship and emergent recognition. Pluth's highly regarded and productive research program focuses on using chemical approaches to understand the multifaceted roles of hydrogen sulfide (H_2S) in biology.

MARK LONERGAN

Mark Lonergan Receives CAS Tykeson Teaching Award

In the midst of teaching class, Mark Lonergan was surprised by being honored with one of the inaugural College of Arts and Sciences Tykeson Teaching Awards, which recognized his commitment to teaching and ensuring student success. Recipients were honored in February at a public reception hosted by CAS Dean W. Andrew Marcus. The Tykeson awards are given to one faculty member in each of the three CAS divisions. Department Head Andrew H. Marcus nominated Lonergan, citing his effective instruction ad promotion of science literacy.



DARREN JOHNSON

Darren Johnson Receives Martin Luther King, Jr. Award

Darren Johnson was honored as one of six recipients of the 2016 Rev. Dr. Martin Luther King, Jr. Award at a January 2016 luncheon hosted by the Division of Equity and Inclusion. This award is given to those who "go beyond prescribed job duties to exemplify the values and principles of racial justice, equity, and inclusion." Each of the faculty who received the award were nominated by their peers due to having demonstrated qualities and causes the late civil rights leader supported. Johnson received the award in recognition of being the faculty sponsor for the UO's Women in Graduate Sciences program and for his work in the establishment of the UO chapter of the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers. (See page 2 of this newsletter for more about UO's diversity programs)

MIKE HALEY

Haley/Johnson Start-Up Recognized With Three Honors

Darren Johnson and Mike Haley's start-up company, SupraSensor Technologies (**suprasensor.com**), was featured in a National Science Foundation Science Nation video, released to coincide with National Agriculture Day on March 15. (Watch the video here: **http://www.nsf.gov/news/special_reports/science_nation/suprasensor.jsp**). Headed by former UO doctoral student Calden Carroll, SupraSenor has developed a molecular sensor that monitors nitrate levels of fertilizers used on agricultural fields. This story appeals on many levels because overuse of fertilizer is a widespread problem that has a direct impact on water quality. The company slowly grew through grants from its inception five years ago, and is now a commercial enterprise.

The research behind the SupraSensor story garnered the team a nomination as finalist in National Public Radio's 2016 Golden Mole Award for Accidental Brilliance in Science earlier in the year. Carroll was nominated for the award by someone the team did not know, suggesting just how far-reaching the implications for this research have become. Haley and Johnson also received one of seven Sustainability Awards at a dinner ceremony in May. The University of Oregon has long been known for being on the forefront of

sustainability, and in 2015 the UO Office of Sustainability launched its award program to recognize the individuals who lead the culture of sustainability. Watch the short video **(youtu.be/oDcVTtYbPzM)** explaining the nitrate sensor Haley and Johnson developed through SupraSensor Technologies.

Student Awards

5 NSF Graduate Fellowships and 1 Honorable Mention

The announcement of the 2016 National Science Foundation Graduate Research Fellowship winners yielded five UO chemistry graduate students among the recipients: Micah Donor, Aurora Ginzburg, Mari Saif, Meredith Sharps, and Andrea Steiger. One more grad student, Lisa Eytel, received an honorable mention. In addition, two UO Chemistry-Biochemistry alumni also received awards, and a third alum received an honorable mention. The NSF made their selections out of nearly 17,000 applications. Each Fellow receives a three-year annual stipend of $34,000, along with a $12,000 cost of education allowance for tuition and fees.

Nell selected for 25 Ducks

25 Ducks recognizes an important few of the more than 24,000 students who call the University of Oregon home. Peers, professors, and staff nominate individuals who demonstrate leadership, innovation, and passion. Kara Nell, who was president of Women in Graduate Science, was selected because of her work in science education outreach programs. See page 2 for more about how Nell helps to make the UO community more diverse.

KARA NELL

Greenaway Honored with Two Awards

Ann Greenaway, a PhD candidate in the Boettcher lab, was one of 90 doctoral students in the U.S. and Canada selected to receive a $15,000 Scholar Award from the P.E.O. Sisterhood (Philanthropic Educational Organization). In addition, Greenaway was chosen by the American Association of University Women for the prestigious 2016-17 AAUW American Fellowship. Her graduate work focuses on the development of low-cost alternative growth methods for efficient solar cell materials.

Jansons Receives Dixon Graduate Student innovation Award

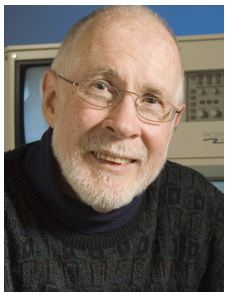
Adam Jansons, a PhD candidate in the Hutchison lab, received the Julie and Rocky Dixon Graduate Student Innovation Award. The Dixon award is designed to support doctoral students who are interested in pursuing innovative experience that will prepare them for careers outside of academia in areas including industry, business, and the non-profit and government sectors. Jansons' research focuses on the precision synthesis and characterization of binary, mixed, and core/shell metal oxide nanomaterials, which are critical materials for optical, energy production and storage, chemical sensing, and electronic applications.

ADAM JANSONS

Cooper, Crocket, Jansons Recognized As University Innovation Fellows

Graduate students Susan Cooper, Brandon Crockett, and Adam Jansons were named University Innovation Fellows by the National Center for Engineering Pathways to Innovation. They completed six weeks of online training followed by travel to the March meeting of the University Innovation Fellows in California. The students will join other students and mentors throughout the year to foster collaboration and innovation. Watch their video and read more about their project here: **http://bit.ly/24OP9dE**. ■

Alumni Achievement Award



ALAN WAGGONER

Alan S. Waggoner – Pioneer in the development and application of cyanine dyes in biochemistry and cell biology

"Professor Alan S. Waggoner, the Max and Gloria Connan Professor of Life Sciences at Carnegie Mellon University, received the department's 2016 Alumni Achievement Award. Alan received his BA in chemistry from the University of Colorado in 1965 and came to Eugene near the time that I started my UO career. He chose to work with an unknown assistant professor over established senior faculty. In 1969, Alan was my first graduate student to receive a PhD. His research advanced the then-new field of spin labeling and the dynamics of biological lipids in membranes. His thesis work resulted in a remarkable eight publications. Rather than the traditional article about an awardee, the Editor has allowed me to write these brief introductory comments and to let Prof. Waggoner tell his own story, below. Students and alumni, in his story you will find the requirements for a successful scientific career: intelligence and hard work of course, but more. Alan Waggoner has a natural curiosity, a desire and ability to collaborate with others, a sense of humor, flexibility as he seeks out new opportunities, and fearlessness in entering new fields. He also has a streak of humility; he does not mention that his papers have had a large impact and are frequently cited. What does shine through is that a successful career requires a willingness to tackle difficult scientific problems and to produce results that are useful to other researchers and to society.
— O. HAYES GRIFFITH, Professor Emeritus, Biophysical Chemistry & Molecular Biology

Phase 1. Getting started.

I came to UO as naïve graduate student but had a great advisor, Hayes Griffith, a man of patience, good science ideas, and knowhow for getting science done and published. I first realized that I might have something that might point to a career when one evening I noticed that the p-orbital of a nitroxide group attached to a lipid was co-linear with the lipid chain. This would enable distinctive spin resonance spectra depending on lipid orientation. This observation and the investigations that followed helped us understand the orientation distribution and dynamics of lipid chains in regions of biological membranes. Some scientists still do this work. Hayes further helped me on my next big step, a postdoc at Yale with Lubert Stryer. My wife, Karen, and I set out for the East Coast with our cats in our loaded-to-the-top VW bus. Lubert Stryer is one of the greatest teachers I have met. His stories give science and discovery an incredible beauty and humanity.

Phase 2. Beginnings of a professional research career.

While at Yale I met Larry Cohen, a neurobiologist who believed it might be possible to map electrical activity of many neurons simultaneously in brains with fluorescent dyes and imaging cameras instead of one neuron at a time with microelectrodes. As a team, I developed voltage sensitive fluorescent dyes and he tested them in squid axons. I began my academic research career at Amherst synthesizing dyes that would be sensitive to nerve membrane voltage changes. My undergraduate research students and I made many hundreds of dyes. We also did biophysics experiments to learn mechanisms for sensitivity, enabling the design of better voltage probes. With Larry, I got my first series of collaborative research grants. Things worked. Our reputations grew — lucky direction, good friend-collaborator, good opportunity, good science and good impact.

"Things worked. Our reputations grew — lucky direction, good friend-collaborator, good opportunity, good science and good impact."
— Alan S. Waggoner

Others have since built on our work and today there are ongoing "optogenetic" studies on brain neurons with the next generation of optical probes. At Amherst I also met Paul Horan, an expert in flow cytometry, a method to study and sort individual cells at high speeds. To do this, cells must be labeled with fluorescent dyes that identify the cells of interest. There were at that time only a few dyes available. Paul pushed me to make many different color dyes to label the new monoclonal antibodies that were becoming available to study cells. Leaders at Coulter Corp., who made flow cytometers and antibodies, said Paul was right, especially since the AIDS epidemic required fast multi-parameter blood cell analysis. I was convinced to move in this new direction, but a phone call changed where this work would be done.

Phase 3. Expansion of research into a leading center at Carnegie Mellon University.

Lans Taylor was setting up a program at Carnegie Mellon University and invited me to join him. The goal of the Fluorescence Center at CMU was to advance live cell microscopy by combining multicolor fluorescent probes developed by me with his new computerized imaging microscopes. With substantial NSF and NIH funding, our work was revolutionary. All commercial microscope systems sold today have many of the computer, automation, and

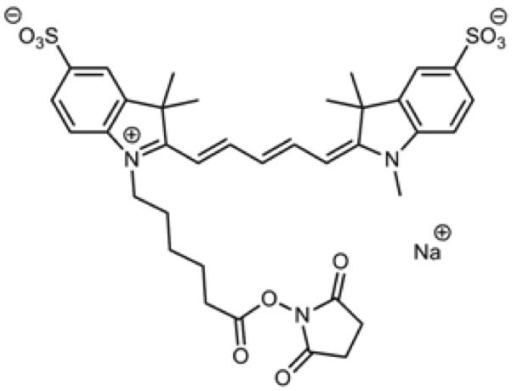
detection concepts we developed built into them. The fluorescent multicolor reagents I was responsible for developing at the Fluorescence Center also had large impact. The most notable were the CyDye labeling reagents.

Phase 4. The commercial world

CMU was one of the early universities to support multidisciplinary research and entrepreneurial activity of the faculty. Lans and I submitted patents on the imaging concepts and the fluorescent label development. Industry did not pick up on the technologies for licensing and the CMU president, Richard Cyert, suggested we form a Pittsburgh spinoff company to commercialize the ideas. Lans and I wrote a business plan and attracted excellent investors. We hired an operations team, and I was asked to take a leave from CMU to help out. What an experience! We struggled. A British company (Amersham) collaborating with a California instrument company (Molecular Dynamics) wanted to get into the DNA sequencing business. The best way to do this kind of sequencing was to label the DNA fragments with fluorescent dyes. They knew the CyDyes were the best bet and proposed to acquire this technology from the startup company, which had the license to the CyDye technology owned by CMU. Everyone agreed and Amersham asked me to join their company as Principal Scientist, or Head of Fluorescence. The four years at Amersham were great! Aside from living in London part of the time, I did not have to manage anyone. Pre-acquisition Amersham was a radioisotope company, so I trained in fluorescence detection technologies. I attended strategy meetings at fine resorts. I got to evaluate technologies and companies for licensing or acquisition. And, it turned out that the CyDye technology was most valuable for a completely different business than the sequencing originally planned. The application of fluorescent probes on microarray chips for quantifying the expression (turning on and off) of genes in normal and diseased biological samples became a big commercial success. Cy3 and Cy5 were the best labels. The revenues from these products have provided CMU with its largest royalty stream.

Phase 5. Director of Molecular Biosensor and Imaging Center (MBIC) at CMU

Amersham reorganized and was eventually acquired by GE Healthcare. By this time Lans Taylor had left CMU. They needed a director for the Fluorescence Center and asked me to come back. I did but I had to scramble. There was a large staff at the center



Reactive Cy5 dye that is used, for example, to label proteins and DNA probes.

and the NSF support dwindled. We sought funding from other sources, and joined colleagues at NASA Ames and the robotics department at CMU to build a rover to investigate life on Mars. The idea was for the rover to use artificial intelligence to find sites that might have life and then spray four different and differently colored fluorescent probes onto the rocks and soil and image the signals with a multicolor detection system. None of the probes fluoresced unless bound to its target. One of the dyes bound to DNA, another to lipid, another to protein, and the fourth to carbohydrate. We tested the rover system for three years on the driest desert in the world, the Atacama Desert in Chile. The rover covered hundreds of miles and acquired hundreds of images. If life was present—for example, if lichens were found near regions with costal nighttime fog—the imager was able to obtain images confirming their presence.

In 2005 we received a substantial nine-year grant from NIH to join a program called Technology Centers for Networks and Pathways. This was perfect for our center. Cells are regulated by thousands of proteins that can turn each other on or off by different mechanisms. To understand how interconnected protein systems work, scientists measure the location of the protein and its state of activation. Fluorescent probes, in principle, would be perfect for this task. Microscopes could read the location and activity of living cells with an image. We began the task of creating a new concept to design fluorescent probes, or biosensors, for this task. This large biosensor program at MBIC was very successful and many universities have picked up this technology for biomedical applications. A colleague and I have spun off aspects of this technology to form a small startup drug discovery company called Sharp Edge Labs. It is always hard to predict how successful these entrepreneurial efforts will be, but it has brought additional excitement to my life. I enjoy the teaching and Shape Edge Labs is intriguing. Life is good! ■

News Briefs

UO Hosts Life at the Nanoscale Mini-Symposium

Organized by students in the UO's Molecular Biology and Biophysics training grant program, the Life at the Nanoscale mini-symposium was held on campus in June 2016 and showcased recent discoveries about the inner workings of important biological macromolecules such as proteins, DNA, and RNA. Seven world-class scientists explained their techniques including X-ray crystallography and cryo-electron microscopy, nuclear magnetic resonance spectroscopy, and molecular tagging techniques to map the positions of biomolecules and watch biomolecules move and interact to coordinate their biochemical functions. The keynote speech was given by the UO's Brian Matthews, who uses X-ray crystallography to understand how proteins fold themselves into the correct shapes.

DEBORAH EXTON

Deborah Exton Appointed to ACS Division of ChemED Board of Trustees

Senior Instructor Deborah Exton, at Oregon since 1993, has been appointed to the Board of Trustees for the American Chemistry Society Division of Chemical Education. The appointment began January 1, 2016 and continues through December 31, 2017. The Board of Trustees, which is appointed by the ACS DivCHED Executive Committee, meets at every ACS national meeting and oversees all aspects of the ACS's Examinations Institute, formerly the Examinations Committee, which manages all assessment activities carried out through the program. The institute is currently working to build a digital archive of the history of ACS exams.

KEN PREHODA

Ken Prehoda's Origins Research Published in eLife Journal

One genetic mutation more than 600 million years ago is believed to have given rise to a new protein function that helped our single-celled ancestor transition into an organized multicellular organism. Ken Prehoda, professor of biochemistry and director of the Institute of Molecular Biology, published a paper in eLife, an open-access journal launched in 2012 with support of the Howard Hughes Medical Institute, the Max Planck Society, and the Wellcome Trust. The research helps develop a fuller picture of how mutations impact evolution, both in good and bad ways, as well as disease states. Prehoda's paper outlined how his study of choanoflagellates—sponge-like sea dwellers with a tail called a flagellum that allows them to move and gather food—revealed that new protein functions can evolve with a single mutation. This observed mutation dramatically altered a protein's function, allowing it to perform a completely different task. Prehoda's article, entitled "Evolution of an ancient protein function involved in organized multicellularity in animals," is available at **https://elifesciences.org/content/5/e10147**.

JULIE HAACK

UO's Innovation Hub Opens in Downtown Eugene

UO President Michael Schill, Eugene Mayor Kitty Piercy, and about 120 invited guests attended the ribbon cutting of the UO's new Innovation Hub (**http://innovate.uoregon.edu/942-olive-street**) in May. The 12,800-square-foot industrial space officially opened to allow innovation and partnership among science and entrepreneurs. Tenants of the building so far include the Tyler Invention Greenhouse, which aims to connect the UO's expertise in green chemistry with entrepreneurs and product designers to bring to market sustainable products that are safer for the environment and for human health. The university's Product Design Program and the Product Design Launch Lab feature a design studio, computer-assisted design lab and a polymer lab in the western portion of the building. The Eugene branch of the Regional Accelerator and Innovation Network (RAIN) also has office space there. RAIN seeks to create companies and jobs in the southern Willamette Valley. RAIN's 24-hour facility will be accessible to students, faculty, RAIN staff, and RAIN accelerator companies with key cards. The 1908 building underwent a $3 million renovation funded by the UO and the state legislature through RAIN. The Tyler Invention Greenhouse was founded with a $500,000 gift from the Alice C. Tyler Perpetual Trust.

JIM HUTCHISON

20th GC&E Conference Held in Portland

The 20th annual Green Chemistry & Engineering conference took place in June in Portland, Oregon. Two UO faculty who have a long-time interest in green chemistry, Professor Jim Hutchison and Senior Instructor Julie Haack, helped organize several aspects of the program. Hutchison was the conference co-chair and Haack helped design and coordinate the student workshop on finding a greener solution to the use of color in consumer products. Each design team included four students from chemistry and engineering, one "Design Catalyst" from the University of Oregon Product Design Program (undergraduate), and one "Color Expert" from the chemistry community. ■

Alumni News from All Over

2010s

Soroush Amali BS '10 graduated with a degree in human physiology and a minor in chemistry. Amali moved to Portland and began school at Oregon Health & Science University School of Dentistry and is currently in the fourth and final year of the program. "Pursuing an advanced degree amongst candidates of medicine, pharmacy, and nursing has been an incredible experience," Amali says. "My chemistry experience has been invaluable in supporting my understanding of pharmacology, microbiology, and especially in the science of polymer chemistry associated with dental materials."

Renee Arias BS '12 graduated with double majors in biochemistry and human physiology, with a biology minor. She worked in the Institute of Neuroscience with Phil Washbourne from 2007 to 2012, performing experiments on mice and zebrafish to investigate synaptic development and its effects on complex behavior. While at UO she received a Dean's List scholarship as well as an Undergraduate Research Fellowship. Arias was a member of the Chemistry Club, the Women in Graduate Sciences group, and the Society for College Scholars. Upon graduation she received the Excellence in Biochemistry Award.

Currently, she is a second-year graduate student at California Institute of Technology in Pasadena, California, in Professor Douglas Rees' group studying the coordination of substrates to the active site and the overall mechanism of nitrogen fixation by the enzyme nitrogenase using techniques like X-ray crystallography and electron microscopy.

Jennifer Brown, MS '11, graduated with a chemistry degree from the photovoltaic and semiconductor device processing section of the Graduate Internship Program. She is a physical chemical scientist with experience with thermoelectrics, alternative energies, superconductors, and microelectronics. "As an engineer I use CVD and PVD to deposit thin films, and plasma etches to create topography for mosfets/diodes/etc," she writes. "I'm responsible for a lot of metrology. I've also worked with polyimide coatings. I enjoy creating these devices that control electrons." On a personal note, she writes, her second daughter was born in September 2014.

Muhammad Khalifa BS '14 graduated and then continued working in the labs of Michael Haley and Andy Berglund, where he published a first-author paper in *Tetrahedron Letters*. He writes that acceptance of the manuscript was a nice capstone for his undergrad experience. Khalifa is in his second year of the Pharmaceutical Sciences PhD program at UW Madison, where he recently won an NSF Graduate Research Fellowship. He says he would love to hear from any Ducks in the area.

Mason Murphy BS '13 received the Heyer/LaMore Leadership Award while at UO studying biochemistry. That award honors two University of Oregon students who died following an accident on an icy stretch of Oregon highway. The award empowers the UO's Outdoor Pursuits Program to recognize students demonstrating outdoor leadership merits and contributions toward the educational mission of the OPP. After college, Murphy writes, he built and remodeled a building and put a tap house in it called 40 Taps (**fortytaps.com**). He trained the staff, and is now working as a scientist for the Confederated Tribes of the Umatilla Indians.

2000s

Kristen Aramthanapon BS '03 graduated with a biochemistry degree with honors. While at UO, she received the Organic Chemistry Achievement Award for work with John Keana (2001-03). From 2003 to 2004 she was Chemistry Technician at Hewlett Packard (in Corvallis, Oregon) on project Lightscribe. From 2004 to 2007 she was Research Associate with Prof. Steven Zimmerman at UIUC, where she received her MS. From 2007 to 2011 she was Lead Chemistry Developer at Wolfram Research and Wolfram Alpha in Champaign, Illinois. Since then, she has been Chief Technology Officer at Sylvatex Inc. in San Francisco, California. From 2007 to 2009 she was a chemistry instructor at Parkland College, Champaign, Illinois. From 2013 to the present she has been an adjunct faculty member at Berkeley Extension, Berkeley, California, and from 2014 to the present she has been a research affiliate at Lawrence Berkeley National Lab, Berkeley, California.

Chelsea (Hamilton) Brundage BS '02 graduated with a BS in biochemistry with an Honors College minor. She then attended Georgetown University School of Medicine where she took an Army Scholarship and has been an Army doctor ever since. She graduated with her medical degree in 2007. Brundage, now married, originally started residency in neurology, though after two years realized her heart was in rehabilitation and in caring for amputees. After withdrawing from neurology she deployed with the 82nd Airborne to Afghanistan in support of Operation Enduring Freedom, then returned to Walter Reed National Military Medical Center to train in physical medicine and rehabilitation (PM&R), which she graduated from in 2013. She then was assigned to Fort Bragg in North Carolina, working as the clinic chief of PM&R from 2013 to 2014, later being reassigned to Fort Belvoir Community Hospital in Virginia, where she is the current assistant clinic chief and current electrodiagnostics chief. Brundage says she misses running in Oregon and is training to obtain an Olympic Marathon Trials qualifying time.

Aleena Garner BS '07 studied biochemistry and psychology before transferring to the University of California, San Diego, to earn her PhD in neuroscience with Mark Mayford. "My thesis work involved investigating memory formation and resulted in a publication in the journal Science entitled, "Generation of a Synthetic Memory Trace" (**http://www.ncbi.nlm.nih.gov/pubmed/22442487**)," Garner writes. "I also received the Chancellors Dissertation Medal in 2013 from UCSD, for outstanding PhD research."

After graduate school Garner worked at the Allen Institute for Brain Science as a scientist specializing in genetics and optics to build and use imaging systems and microscopes to image neural activity in awake behaving mice. A publication resulting from this work is entitled, "Transgenic Mice for Intersectional Targeting of Neural Sensors and Effectors with High Specificity and Performance" (**http://www.cell.com/neuron/supplemental/S0896-6273%2815%2900137-3**).

"I am currently backpacking through Africa for about 11 months," she writes. "I am of

African descent (via the U.S. slave trade, and am therefore not certain of my exact heritage). I am traveling with a friend who studied international economics and policy in college, and our plan is to write a book to provide a perspective for Western readers as to what Africa is and who the people are who live here."

In March, Garner began a post-doctoral research position at the Friedrich Miescher Institute for Biomedical Research in Basel, Switzerland, to continue her research on sensory perception and memory formation.

Jeremie Miller BS '04 earned his chemistry degree while doing undergraduate research in the lab of Mike Haley. He earned his PhD in 2009 at the University of Utah in the lab of Matt Sigman, probing the relationship between ligand structure and selectivity in enantioselective reactions. He then earned an MBA in finance from Katz Business College, University of Pittsburgh. His post-doctoral research studying the development of a one-step procedure for the synthesis of aniline and aniline-derivatives from benzene was conducted with Michael Limbach at Catalysis Research Laboratory in Heidelberg, Germany, supported by BASF. Miller remains a BASF employee, having climbed the ranks from research scientist (2010 to 2011) to second-level senior research scientist (2011 to 2012) to R&D supervisor (2012 to the present). He is currently leading a team of five members in established research and development projects as well as new business development.

Sara Molinari BS '07 graduated with a major in biology and a minor in chemistry. She writes that during her time at UO, her interest in chemistry flourished. She pursued a pharmacy career after one of her organic chemistry lab instructors encouraged her to consider that field. She attended Portland State University, then the Oregon State University/OHSU College of Pharmacy from 2009 to 2013. She obtained her PharmD degree and became a licensed pharmacist in 2013. Molinari worked as a staff pharmacist for Rite Aid Pharmacy in Portland and since 2013 as a Staff Pharmacist at the Oregon State Hospital in Salem. "Psychiatric pharmacy has always been a fascinating and challenging area of study for me, so I am very happy to have been afforded the opportunity to practice here, with a population of patients who are often stigmatized and underserved," she says. Molinari currently lives in southwest Portland with her boyfriend, Dan. She is enjoying exploring Portland and the greater Northwest and tells us she loves hiking, cooking, reading, dining out, and spending time with family and friends.

Ivana Nusantara BS '05 graduated with a major in chemistry and minor in business administration. She then returned to her home country, Indonesia, and took a job in the R&D division of a manufacturer of soaps, toothpaste, detergents, and home cleaning agents. In 2006, she went to Shanghai, China, to learn Mandarin, then realized her passion is entrepreneurship. She owns and manages two pilates and yoga studios in her hometown, Jakarta, and plans to open a franchised pre-school in Jakarta. "My education and college experience at the University of Oregon has undeniably contributed to my eagerness to explore and experiment with all opportunities in my life," she says.

Brian Truong BA '07 worked with Andy Berglund to earn his degree in biochemistry with departmental honors. He then attended Oregon Health & Science University and graduated with his MD in 2014. Truong is currently an anesthesiology resident at the University of Washington and will complete his training in 2018.

Yevgeniya Turov BS '07 worked in the research lab of David Tyler and graduated with a major in chemistry and minors in mathematics and honors college. She moved to research linear trimetallic compounds with different axial ligands, using techniques such as X-ray crystallography, NMR, EPR, UV-Vis, and CV at the University of Wisconsin, Madison. Turov graduated with her PhD in inorganic chemistry in August 2012. She then moved to La Crosse, Wisconsin, where she is an Associate Lecturer at University of Wisconsin. She was nominated by students and won the Provost's Teaching Excellence Award for her general chemistry teaching. In 2011, she married her husband, Jason, and they have a 2-year-old daughter, Elise.

Ben Wiggins BS '03 graduated with a degree in biochemistry through the Robert D. Clark Honors College. He completed an MS in molecular biology and a PhD in the learning sciences. He runs the teaching side of the biology department at the University of Washington, where he is also a lecturer in molecular biology and civilizational biology. His NSF-funded research is focused on cultural learning in large classroom environments. [Editor's note: incorrect information for Wiggins was included in last year's newsletter.]

Sara (Staggs) Wisser, MS '05, earned her degree while studying supramolecular chemistry and bioorganic studies. In 2004, Wisser founded the group University of Oregon Women in General Science, (**http://pages.uoregon.edu/uowgs**), which encourages women and girls to explore science and supports members and non-members at the graduate level. The Sara Staggs Undergraduate Transition Award for the UOWGS is named in her honor. She received a Graduate Fellowship through the National Science Foundation GK-12 Program University of Oregon from 2004 to 2005, and was president of Life Technologies International Women's Influential Network (IWIN) Field Chapter from 2011 to 2014. She was also on Life Technologies Sales Advisory Council from 2010 to 2013 and was the Top Genetic Analysis Sales Representative for Life Technologies in 2013. In 2014, she joined Chairman's Club at Thermo Fisher Scientific.

1990s

Matt Clifton BS '99 majored in biochemistry and has gained expertise in structural biology, biophysics, and drug discovery. He manages fragment-based drug design programs including NMR, SPR, DSF, DSC, Mass Spec, and other biophysical techniques. He earned his PhD in biochemistry and molecular biology from Purdue University in 2005 and performed postdoctoral research at the Fred Hutchinson Cancer Research Center. He is currently manager of structural biology at Beryllium and has deposited more than 200 structures in the Protein Data Bank on a range of drug targets ranging from infectious disease to cancer. He is the author of 26 scientific papers, has been married since 2013, and currently lives in Boston, Massachusetts.

Jesse Dambacher BS '99 majored in chemistry while at UO. After graduating, Dambacher earned a PhD in chemistry from UC San Diego, then did a one-year postdoc in medicinal chemistry at The Sanford-Burnham Medical Research Institute in La Jolla, California, and then a two-year medicinal chemistry postdoc at The Scripps Research Institute. Dambacher changed industries and in 2010 took a research scientist role at Valvoline in Lexington, Kentucky, and is currently an R&D Director in charge of additive synthesis and renewable lubricant formulation. Dambacher recently finished a company-sponsored MBA at the University of Kentucky. Outside of work, he is married to Mariceli with three children. He enjoys ultimate frisbee, running, fishing, brewing beer, and watching Oregon football and basketball games.

Daniel Koos, PhD '91, studied the non-linear optical response of metal electrodes with Prof. Geri Richmond. He entered the semiconductor industry as a process technologist and has worked for several companies in a variety of locations. He is currently working in Idaho but plans to return to Portland.

Kang Foon Lee BS '93 graduated with a chemistry major and minor in environmental studies. Lee is currently working in Portland, Oregon as a senior analytical chemist in a small-molecule organic chemicals manufacturer and is the QC manager of the analytical department.

Susan Moss BS '95 graduated summa cum laude in chemistry. She worked doing environmental and metallurgical chemistry until 2000, then attended law school and worked as a commercial litigator for nine years. She sat for the patent bar exam and is now working as a patent attorney at Lee & Hayes PLLC in Spokane, Washington, in a practice involving mostly software patents. She is living in her hometown of Coeur d'Alene, Idaho, about 30 minutes away, and has two daughters, ages 7 and 5.

Quanyuan Shang, PhD '90, earned a degree in physical chemistry with Bruce Hudson. Shang's research was on electronic structure of linear polyenes. Shang worked as a process engineer in applied materials for 17 years developing thin film processing technology for TFT-LCD display manufacturing and received a R&D100 award in 1998. He started a company developing advanced manufacturing technology for the solar industry. His wife, Shumay Shang, PhD '91, was also a classmate. She works as product marketing manager for Mentor Graphics, a Portland, Oregon, company specializing semiconductor design software. They have three children and live in Silicon Valley.

1980s

Paul Jagodzinski, a post-doc with Warner Peticolas from 1979-1981, continues as Dean of the College of Engineering, Forestry, and Natural Sciences at Northern Arizona University. He also serves on the American Chemical Society Board of Directors.

Gregory Milligan BS '83 graduated with a chemistry degree. As a senior, he did research in organic synthesis with the late Lloyd Dolby, and later worked at his company, Organic Consultants Inc. After graduation, Milligan worked for 1 1/2 years as a bench chemist in the herbicide discovery unit at Monsanto in St. Louis, Missouri, where he felt lucky to be in the very small research group headed by John Franz, inventor of glyphosate (Roundup). "To say that money was no object for our group is an understatement," he says. "I got a taste of life as a BS bench chemist and while I didn't dislike it, I soon knew that I wanted to go back to grad school to earn my PhD." He returned to the University of Washington in 1985 and graduated with a PhD in 1990.

That year he and his wife, Sara, moved to Topeka, Kansas, where she entered a medical residency program, and Milligan did a postdoc in the laboratories of Jeff Aubé at the University of Kansas in Lawrence. "My years with Jeff were the most productive and intellectually stimulating of my professional life. We were lucky enough to discover the intramolecular version of the Schmidt reaction of ketones with alkyl azides," he writes. After three years with Aubé, he then taught organic chemistry for two years at Washburn University of Topeka as a visiting professor.

In 1995 the couple moved to Olympia, Washington, where Sara started her career as a psychiatrist and Milligan stayed home with their young children. In 2002 their youngest started kindergarten and he writes that he was hired as a tenure-track faculty member at Saint Martin's University in Olympia. He is now Chair of the Department of Natural Sciences. "I owe a lot to the University of Oregon," he writes. "The faculty were forthcoming and approachable (Virgil Boekelheide taught one of my organic recitation sections!). My classmates were fine people, and I couldn't have made it through without them."

Rebecca Price, MS '84, earned her MD. She has retired from her general surgery practice and spends her time volunteering with Master Gardeners, the Alzheimer's Association, and the Northern Arizona Forestry Department.

1970s

Norman L. Eberhardt, PhD '72, graduated following research under Raymond Wolfe. His field of expertise was molecular endocrinology, specifically, molecular pathogenesis of thyroid cancer. In 2013, Eberhardt was Emeritus Professor of Medicine, Mayo Clinic, Rochester, Minnesota. From 1997 to 2013 he was Professor of Medicine at the Mayo Clinic. From 1994 to 2013 he was Associate Professor, Department of Biochemistry and Molecular Biology, also at the Mayo Clinic. From 1989 to 1997 he was Senior Associate Consultant and Associate Professor at the departments of medicine and biochemistry and molecular biology at the Mayo Clinic. Before that, from 1987 to 1989, Eberhardt was associate adjunct professor of biochemistry in medicine in the metabolic research unit at the University of California, San Francisco. From 1980 to 1987 he was assistant adjunct professor of biochemistry at UC San Francisco. From 1976 to 1980 he was research associate in the endocrine research division at UC San Francisco. Prior to that, Eberhardt was associate of Howard Hughes Medical Institute from 1977 to 1980. From 1974 to 1975, he was a research biochemist in the department of physiology and anatomy at the University of California, Berkeley. Immediately after graduating, from 1973 to 1974, Eberhardt was postdoctoral fellow at the department of biochemistry at the University of Utah Medical Center in Salt Lake City.

1960s

Claibourne Smith, PhD'64, received his PhD in organic chemistry, then became an executive of DuPont. He retired as vice president of technology in 1998, followed by an appointment in 1988 by then-governor of Delaware, Michael Castle, to serve as a trustee of Delaware State University. In January 2016 he attended his last regular meeting as a member of the DSU Board of Trustees, ending his 28 years of DSU service by being presented the honor of trustee emeritus. ■

Honor Roll Chemistry Gifts, July 1, 2015–June 30, 2016

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You can now donate directly to the Department of Chemistry and Biochemistry via a secure link on the web:
bit.ly/2dPgYfw

In Memoriam

Ray Wolf

UO Chemistry and Biochemistry **Professor Emeritus Raymond Wolfe** passed away on December 24, 2015. Wolfe joined the University of Oregon Chemistry faculty in 1956, where he taught and conducted research for 34 years before retiring in 1990. A lifelong advocate of open dialogue and community activism, in his retirement Wolfe hosted his own weekly television program titled "In the Public Interest" on local Public Access TV. He was remembered as

"a father, a teacher, a scientist, and a social activist who worked throughout his life to make the world a better place."

He will be missed!

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Chemistry and Biochemistry News
A publication of the University of Oregon Department of Chemistry and Biochemistry, distributed to alumni, faculty and staff members, postdoctoral fellows, students, and friends of the department.

Editor
Vanessa Salvia

Faculty Advisor
Michael Haley

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