

Fall 2013 Newsletter

Department of Chemistry



By: Mark Floyd
Sources: Sabah Randahawa and Sastry Pantula

Oregon State University has named Sastry Pantula, a statistics professor at North Carolina State University who since 2010 has served as director of the National Science Foundation's Division of Mathematical Sciences, as Dean of OSU's College of Science. Pantula, who will begin his new duties on Aug. 30, succeeds interim dean Vince Remcho. A fellow of the American Statistical Association, he served as president of that organization in 2010. He also is a fellow of the American Association for the Advancement of Science. "Sastry Pantula has a distinguished career during which he consistently has demonstrated his ability to help develop outstanding opportunities for undergraduate and graduate students and collaborative research, as well as build strong and diverse faculty," said Sabah Randhawa, OSU Provost and Executive Vice President. "The College of Science, and Oregon State University, will benefit from his excellent organizational and leadership skills." Pantula has been on the North Carolina State faculty since 1982. He headed the statistics department there for eight years, and also directed the university's Institute of Statistics. During his tenure, he worked with his dean and the college foundation to create three \$1 million endowments for distinguished professors. Since 1999, working with colleagues and alumni, he also has secured more than \$7 million in funding from the National Science Foundation and other agencies and industries to promote graduate student training and mentorship. His own research focuses on time series analysis and econometric modeling, with a broad range of applications. He has worked with the National Science Foundation, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, and U.S. Bureau of Census on projects ranging from population estimates to detecting trends in global temperature. Pantula has bachelor's and master's degrees from the Indian Statistical Institute in Kolkata, India, and a Ph.D. in Statistics from Iowa State University.

Dipankar Koley joined the Department of Chemistry as a new Assistant Professor in September 2013. Dr. Koley obtained his PhD in chemistry from the University of Texas at Austin in 2011 and was a post-doctoral fellow at the University of Michigan until the summer of 2013. His research interest lies at the intersection of electrochemistry, biology and bioengineering. In OSU, Dr. Koley and his team will be working on developing new electrochemical techniques such as Scanning Electrochemical Microscopy (SECM) to understand the microbial metabolic exchange in biofilm at high spatial and temporal resolution.



Michelle Dolgos, Assistant Professor, joined the Department of Chemistry in September 2013. She completed her PhD at the Ohio State University in 2009 and was a post-doctoral researcher at the University of Liverpool from 2009-2012 and in the Center for Sustainable Materials at Oregon State from 2012-2013. Her research interests lie in the synthesis and characterization of new, improved materials for energy applications as well as for electronic applications, with a focus on using environmentally benign materials with low toxicity.



Dr. Sandra Loesgen is an Assistant Professor in the Department of Chemistry. Her research focuses on drug discovery through the identification and characterization of bioactive compounds produced by microbial sources. One of her current projects involves the development of new anti-virals using novel screening methods to isolate drug leads, and a suite of biophysical techniques to examine their mechanism of action.



Dr. Loesgen obtained her Ph.D in Organic Chemistry and Pharmacology at Göttingen University in Germany, where she examined the bioactive compounds produced by endophytic fungi. She subsequently received a DFG postdoctoral fellowship to identify and characterize novel compounds with anti-tumor activity from the metabolites of marine bacteria in the laboratory of Dr. Fenical at Scripps Institution of Oceanography. She joins us from the Laboratory of Bioorganic Chemistry at the NIH, where she received an intramural research award to examine the interaction of anti-viral compounds with their target proteins.

Chemistry

New Hires (continued)

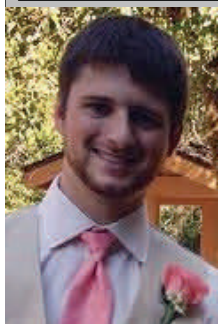
Chris Knutson was born and raised in rural Wisconsin where he attended the University of Wisconsin Eau Claire. At Eau Claire, Chris did matrix isolation spectroscopy of Van der Waals compounds under the guidance of Professor James Phillips. During this work, Chris grew his first crystals and got to do some x-ray work which sparked his interest in the chemistry of solids. With his new interest in solid-state chemistry, Chris decided to attend Oregon State University for graduate work under Professor Douglas Keszler. Under Keszler, Chris worked on diverse projects studying amorphous materials and their roles in novel electronic and optical devices. After graduating, Chris did a postdoctoral fellowship at University of Oregon with the Center for Sustainable Materials chemistry in which he concentrated on educational outreach and informal science education opportunities. Creating a scientifically informed citizenry is Chris's primary passion, but in his free time he enjoys bicycling, archery, cooking and primitive crafts.



Paula Weiss grew up in the New River Valley in Virginia. After high school she took a break before earning her Associate's degree from New River Community College. She then earned a B.S. in Chemistry from Radford University. After that she pursued graduate work at Virginia Polytechnic Institute and State University (Virginia Tech) with Prof. Diego Troya. Her work focused on the use of reparametrized semiempirical Hamiltonians in direct dynamics studies. The use of semiempirical Hamiltonians in direct dynamics studies diminishes the computational cost of trajectory calculations and negates the need for an analytical potential energy surface when performing reaction dynamics studies. The reparametrization of semiempirical Hamiltonians increases their agreement with experiment and high level ab initio theory.

Paula then moved cross-country in late 2007, never having been to the west coast before. She worked at Linn-Benton Community College for several years before joining Oregon State University in Fall 2010. She currently teaches 100-level General Chemistry courses. In her free time, she enjoys

visiting the Oregon coast and the Oregon Shakespeare Festival.



Kevin Alsip was born and raised in Corvallis and graduated from Oregon State University in 2009 with a BS in Anthropology. In 2011 he joined the Department as a Lab Assistant and recently accepted a new role as the Science Storekeeper. In addition to his position at OSU he owns and runs his own photo booth company on the weekend. When not working he enjoys spending time with his family, riding his bike and fishing. Go Beavs!

Nicolas Abayare was recently hired as a new Lab Assistant for Gilbert Addition. He is 22 years old and a 2013 Chemistry graduate from our very own department. In his free time he enjoys playing and watching basketball. He looks forward to seeing what opportunities working at Oregon State will bring him in the future.



Bret Hartsfield graduated from Oregon State with a BS in Chemistry in June 2013. He recently started as a lab Assistant in Gilbert Addition. He chose Oregon State to get some hands on lab experience and to take a break from school. Eventually he would like to return to school for his Master's in Inorganic or Organometallics. In his spare time he likes wakeboarding, snowboarding, hunting and anything in the outdoors.

Erin Mustard was hired in 2013 as the Undergraduate Coordinator for the Departments of Chemistry and Physics. Her home office is with Physics but she issues overrides and completes other tasks for Chemistry. She works with students, advisors and faculty to ensure students are able to get into the classes they need and stay on track for graduation. She also works with faculty members to make sure the schedule of classes is correct and answers a broad range of questions via phone and email.



Like us on Facebook
www.facebook.com/OSUChemistry



Circle us on Google+
<https://plus.google.com/113884590814060860716/posts>



Follow us on Twitter
[@OSU_Chemistry](https://twitter.com/OSU_Chemistry)



Read the Blog
Blogs.oregonstate.edu/erlenmeyer

Chemistry

Undergraduates of the Quarter



Arsalan Zolfagari – Undergraduate of the Quarter, Winter 2013

Arsalan was born in Portland and went to Aloha High School. He came to OSU because of the high quality of education available here for a “fraction of the cost of other places.” During freshman orientation, he was initially registered as a biology major. When Dr. Chris Pastorek walked into the College of Science orientation and announced “All chem majors come with me,” he felt a spontaneous desire to follow her and has never looked back. His favorite instructor is Emile Firpo due to his incredible generosity. His interest in organic chemistry was sparked during the CH 334/335/336 series and he considers doing research with organic chemistry professor Paul Blakemore his best experience at OSU. His favorite course was CH 435 Spectroscopy with Chris Beaudry. After graduation, he intended to go to grad school to obtain a PhD in Chemistry and hopes to be a university professor one day. OSU and the Chemistry Department are so lucky to have talented students like Arsalan.

Jason Nikkel — Undergraduate of the Quarter, Winter 2013

Jason was born in Corvallis, but moved to Philomath at age 5. His science high school teacher and OSU alumni (Molly O'Malley) got him excited about science – he took anatomy & physiology, chemistry and biology in high school from

her. He came to OSU because of the positive experience his brother had at OSU and its close proximity to home, which reduced the cost of going to college. While he started as a chemistry major with a pre-med option (as he loved anatomy and physiology in high school), his interests have transitioned to materials science and solid state chemistry during his time at OSU. He first worked with Dave Cann in the Materials Science program on high temperature piezoelectrics. In 2011, he presented a poster at the International Symposium for Applications of Ferroelectrics on Vancouver Island, Canada. In 2012, he participated in the NSF REU internship spearheaded by Chemistry Professor Doug Keszler and subsequently has transitioned into Keszler's lab to work on oxide growth of amorphous metal films. He has a hard time just picking one favorite course at OSU, but Experimental Chem 1 would be “up there” due to the course environment and the friends he made through the process. Glenn Evans and Mike Lerner would be his favorite instructors during his time at OSU. In addition to chemistry, Jason has been an active participant in the OSU Men's Choir. He plans to go to graduate school at NC State after graduation to obtain a PhD in Materials Science and Engineering – likely focused on long range and short range ordering of materials. We are proud of talented students like Jason that continue to raise the profile of our Department, College and OSU!

(continued on page 14)



Staci Simonich Has Year Full of Honors and Awards

Staci Simonich has been named Associate Editor of the new Environmental Science and Technology Letters Journal being published through the ACS. According to their website, the ECTL is an “international forum for brief communications on experimental or theoretical results of exceptional timeliness in all aspects of environmental science, and short reviews on emerging environmental science and technology topics.” In addition to the Associate Editor position, the ECTL also Awarded Staci with one of their three “Top Reviewer Awards.”

In late September, Staci was honored with the OSU Impact Award for Outstanding Scholarship. This award recognizes OSU faculty who have demonstrated outstanding scholarship in a specific project or activity resulting in substantial impact beyond the university setting.”

She was instrumental in the arrangement and planning of ISPAC 2013, the International Symposium on Polycyclic Aromatic Compounds that was held here at OSU, recognized for her research on cancer causing e-waste in Chinese populations and had 10 papers accepted for publication. Leah Chibwe, a graduate student in the Simonich re-

search group who was recently awarded the KC Donnelly Externship Award, says, “I really enjoy working in Staci's lab; it's the best fit for me and I believe that's primarily due to the environment Staci has created. As a mentor she is very encouraging. She understands what it's like to be a graduate student; and having a mentor like that: someone who is always on your side is something I really appreciate about her.” Shelby Paulson, and undergraduate also working with the group received the Undergraduate of the Quarter Award for Spring Term 2013, saying she “really valued the research experience.”

Congratulations to Staci for all she's accomplished this year and for the much deserved recognition!



Chemistry

Dear Alumni and Friends,

The 2012-2013 academic year for the Chemistry Department was a highly successful one. We graduated a record 40+ students with Bachelors degrees, 6 students with Master's degrees and 11 students with Doctorate's (page 5). Our students are commonly ranked as some of the top students throughout the University (Page 14) – including the 80+ names recognized during the 2012-2013 academic year on the OSU Honor Roll (Page 15). **Maduka Ogba** (Doctoral Student, Assistant Professor **Paul Ha-Yeon Cheong** advisor) was awarded the campus-wide honor of the 2013 Herbert Frolander Outstanding Graduate Teaching Assistant Award (Page 14). **Oleksii Motorykin** (Doctoral Student, Professor **Staci Simonich** advisor) was awarded the C. Ellen Gontar Award in the Environmental Chemistry Division of the American Chemical Society (Page 14). We recognized **Arsalan Zolfagari**, **Jason Nikkel** and **Shelby Paulson** as Undergraduates of the Quarter (Pages 3 and 14). The Department also delivered a record 54,705 credit hours of instruction over the 2012-2013 academic year.

The Department also hired 5 new faculty members (Pages 1-2). Assistant Professor **Dipankar Koley** comes to us from the University of Michigan where he was a postdoctoral fellow. His research interests are in developing new electrochemical techniques for studying biofilms. **Michelle Dolgos** was a postdoctoral fellow in the **Center for Sustainable Materials** at OSU prior to joining the faculty as an Assistant Professor. Her research interests are in the synthesis and characterization of new materials for energy applications. Assistant Professor **Sandra Loesgen** comes to us from the National Institutes of Health where she was a postdoctoral fellow at NIDDK. Her research interests are focused on drug discovery using microbial sources of bioactive compounds. Instructor and OSU PhD graduate **Chris Knutson** was a postdoctoral fellow in the **Center for Sustainable Materials** at the University of Oregon prior to joining the Department. Chris will be focused on teaching our General Chemistry of Engineers sequence. Instructor **Paul Weiss** initially came to our Department through a short term appointment; however, her strong performance as an educator coupled with the growing student population at OSU enabled her to transition to an annual Instructor appointment. Paula will continue to teach in the General Chemistry for non-science majors sequence and contribute to our highly successful e-campus program (Page 11).

Kim Thackray and **Marita Barth** had an exhibit for our e-campus program at the 2013 National Science Teachers' Association (NSTA) in San Antonio (Page 13). Our faculty members continue to do amazing things. Assistant Professor **Chong Fang** has made important, new advance in photonics (Page 6). Distinguished Professor **Doug Keszler's** is focused on developing more environmentally friendly flat-panel displays (Page 7). Professor **Staci Simonich** has been named Associate Editor of a new ACS journal and received the OSU Impact Award (Page 3). Professor **Vince Remcho** has been named the inaugural Patricia Valian Reser Faculty Scholar (Page 10). Professor **Walt Loveland** was awarded the prestigious 2014 Seaborg Award in Nuclear Chemistry from the American Chemical Society (Page 10). Emeritus Professor **Joe Nibler** was honored with the 2012 Senior Scientist Mentor Award (Page 13). Department faculty also hosted ACS NORM 2013, 2013 NASSCC and ISPAC 2013 conferences on campus this summer (pages 8, 9 and 3).

Our graduates are the most important endeavor of our Department. We want to hear from you. Please drop us a letter, send us an email or stop by and let us know how you are doing. We also encourage you to like us on Facebook, follow us on Twitter, circle us on Google + or read our blog called the Erlenmeyer flask (Page 2).

Sincerely,



Rich G. Carter



Chemistry

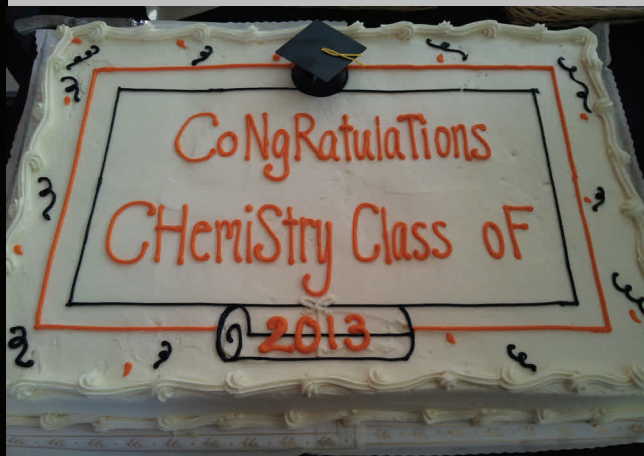
Commencement 2013



Abayare, Nicolas (BS) Pre-Med
Abbott, Amanda (BS) Chem Ed
Cadotte, Andy (BS) Chem Ed
Cowley, Elise (HBS) AdvChem
Duncan, Malachi (BS) Chem Eng
Duong, Mai (HBS) Chem Ed
Eckelman, Brian (BS) Chem Eng
Fargher, Mitchell (BS) Biochem
Fredrickson, K'Sondra (BS) Biochem
Griffin, Caitlin (BS) AdvBiochem
Gumaer, Dustan (BS) Biochem
Hartsfield, Bret (BS) Biochem
Hawes, Dee (BS) AdvBiochem
John, Michael (BS) Env Chem
King, Jennifer (BS) Pre-Med
Laird, Joshua (BS) Pre-Med
Liu, Maggie (BS) Biochem
Mangum, Brent (BS) Sci Ed
Martin, Nicole (BS) Pre-Med
Michel, Abigail (BS) Chem Eng

Mitschele, Amy (BS) Env Chem
Nikkel, Jason (BS) Mat Sci
Nuth, Erica (BS) Pre-Med
Paulson, Shelby (BS) Env Chem
Peterson, Clark (BS) Biochem
Pierson, Daniel (BS) Env Chem
Ping, William (BS) Env Chem
Pittman, Scott (BS) Chem Eng
Reaksecker, Jordan (BS) Biochem
Rogers, Bryan (BS) Pre-Med
Rose, Ben (BS) AdvChem
Schardt, Jenna (BS) Mat Sci
Scott, Richard (BS) Env Chem
Stephon, Nathan (BS) Mat Sci
Stolt, Matthew (BS) Adv Chem
Tan, Xinran (BS) Pre-Med
Vo-Vu, Tron (BS) Mat Sci
Williams, Denise (BS) Chem Ed
Zolfaghari, Arsalan (BS) Biochem
Altschul, Emmeline (MS)

Backe, Will (PhD)
Brown, Michael (PhD)
Brumsted, Corey (MS)
Burgess, George (MS)
Gatimu, Alvin (PhD)
Harthcock, Colin (PhD)
Jariyasopit, Narumol (PhD)
Jiang, Peng (PhD)
Jieratum, Vorranutch (PhD)
Mahapatra, Subham (PhD)
Manzano, Carlos (PhD)
Pierce, Matthew (MS)
Place, Benjamin (PhD)
Precek, Martin (MS)
Savin, Michael (MS)
Su, Dong, (MS)
Suttisintong, Khomson (PhD)



Chemistry

New photonic advances invigorate state-of-the-art molecular spectroscopy

By: Liang Wang, Liangdong Zhu and Chong Fang

As an interdisciplinary research group armed with a newly developed state-of-the-art ultrafast laser system, the Fang group at OSU Chemistry has been tackling problems well beyond the traditional boundaries for physical chemistry. Innovation is at the heart of the research group situated at the 2nd floor of Linus Pauling Science Center (LPSC), and although the footprint of the ultrafast laser room is rather compact at 400 sq ft, it is fully functional and continuously pumping out exciting results in the diligent hands of the postdoctoral fellow Dr. Weimin Liu and graduate students including Liangdong Zhu from Physics and Liang Wang from Chemistry.

During the past year, we have continued the exciting work on ultrafast optical phenomena in thin transparent media. It all started from a serendipitous discovery of bright laser sidebands when we focused two femtosecond amplified laser pulses onto a thin BBO crystal and tried to measure the incident pulse duration via second harmonic generation (SHG). We found more bright and colorful signals than expected, which stirred much interest followed by intense investigations. A range of nonlinear materials (e.g., glass, sapphire, calcium fluoride, quartz, even water) have since provided us many testing grounds to explore these sideband signals, across the wide spectral range from ultraviolet to near infrared. The innovative design of our versatile and flexible setup (see Fig. 1) affords the opportunity to make parametric changes and characterize the nascent sideband lasers both in the spectral and temporal domain using various diagnostic techniques. From countless hours of experimenting within a few months, we not only found SHG-induced cascaded four-wave mixing signals, but also identified bright and colorful broadband up-converted multicolor arrays (BUMAs) at various phase-matching conditions in quadratic media. These sideband lasers are gifted with multifold advantages: background free and filter free, good stability, spatial separation from fundamental beams, great temporal compressibility, and wavelength tunability. We reported this new phenomenon in *Optics Letters*, which paved the way to utilize these sideband lasers in our advanced spectroscopic setup where a stable broadband tunable pulse is in high demand to improve the conventional white light continuum as the probe beam. As a senior graduate student from Dept. of Physics, Liangdong Zhu grasped the opportunity to integrate this newly generated sideband laser into our existing femtosecond stimulated Raman spectroscopy (FSRS) setup, and found sharp spectral signals from an organic solvent mixture covering an unprecedented spectral range of ca. 100-4,000 cm^{-1} . This exciting work of incorporating the BUMA signal into the FSRS setup received rave reviews: "a strong paper that presents valuable new progress in femtosecond pulse generation that will be of broad interest to the readers... an important advance for the field... pushes and adapts the technology", and has been recently published in *Applied Physics Letters*.

So what's next? Can we develop this new method of generating multicolored broadband tunable sideband lasers (Fig. 1) into a generalized technology that can be used by many other research groups in academic or industrial settings? Will the information content be useful in dissecting material properties such as low-frequency atomic motions, which constitute an integral part of our ultimate goal of taking molecular movies? Venturing further into the nonlinear regime of light conversion, the Fang group has recently published another paper in *Optics Letters* reporting cascaded third-harmonic generation in an amorphous medium-air interface. These nascent ultraviolet laser pulses are strongly enhanced at the interface and only emerge under the tightly focusing condition of the incident beams. Upon delaying the two incoming pulses to one another, we observe a rich array of quantum beats that infer the intricate molecular world wherein atoms "dance" on the femtosecond timescale that is intimately related to a typical bond vibration period (e.g., ~20 femtoseconds for the C=O stretching motion). Detailed investigation of these hidden nuclear motions that are potentially responsible for unique properties of each material is currently underway and one particularly captivating research subject is water. We are pleased that our efforts in this pristine territory have not only enriched the knowledge of optics and photonics, but also expanded the capability of the state-of-the-art FSRS technique to investigate a matrix of molecular vibrational motions on the ultrafast timescale, wherein chemical reactions start precisely and progress vividly in front of our very eyes.

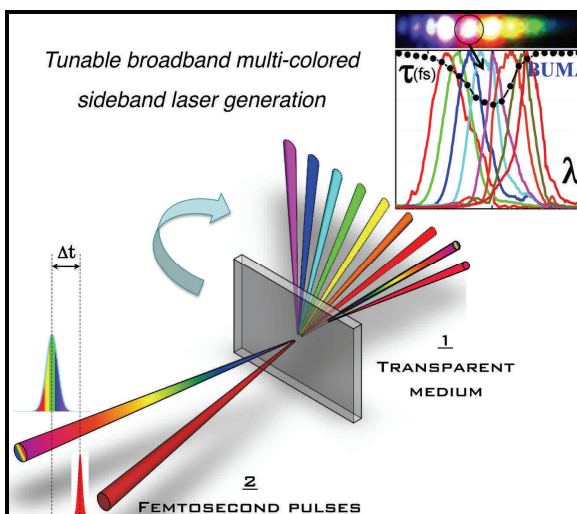


Figure 1: The versatile optical setup using one transparent medium and two incident femtosecond near-IR pulses to generate tunable broadband sideband lasers. The application potential of this new technique based on cascaded four-wave mixing in a thin medium is enormous.

Chemistry

Behind the Screens

OSU-OU Partnership Aims at Greening the Flat-panel display Industry

By: Nick Houtman, Terra Magazine
September 10, 2012

Popular Mechanics' took considerably more than 10 years to come true, but today's flat-panel screens have gone well beyond that early vision. Some of them are nearly as big as a living room wall. They bring us unimaginably sharp detail, from the spots on butterfly wings to the grimace on a linebacker's face. In 2011, the global flat-panel screen industry shipped more than \$120 billion worth of products, enough to cover nearly 16,000 football fields.

However, our love of flashy high-res has a dark side. Manufacturing the semiconductors behind these electronic systems produces waste, lots of it. "The electronics and solar industries build devices where the materials input is very high relative to what ends up in the product. There's tremendous amounts of waste and very high energy input," says Doug Keszler, Oregon State University chemist.

Keszler and a team of scientists and engineers at Oregon State and the University of Oregon are leading a national consortium bent on greening the flat-panel display industry. In their future, windows, mirrors, walls and counters could display messages and harvest solar energy. "We're trying to turn this industry into a truly zero-waste proposition while improving performance," says Keszler, a principal scientist in the [Center for Sustainable Materials Chemistry](#) (CSMC). "We'd like to do electronics the size of a wall. The question is: How do you do that efficiently without producing even more waste?"

The CSMC has already produced significant results: a metal-insulator-metal diode (a kind of electronic switch) that outperforms the fastest silicon-based semiconductors; water-based manufacturing techniques that reduce waste

and improve productivity; high-resolution fabrication processes that forge thinner electronic components. With research roots going back more than a decade at OSU and UO, the center has spun off two startup companies, generated more than a dozen U.S. patents and developed an educational partnership to inspire more Oregon high school students to attend college. It also helps graduates to create their own careers. In cooperation with the National Collegiate Inventors and Innovators Alliance, CSMC students join business leaders in the chemical and electronics industries to identify commercial opportunities stemming from research.

Two startups have already hired the center's graduates. Amorphyx (www.amorphyx.com) is commercializing a new electronics manufacturing process that limits the production of unwanted industrial byproducts. Moreover, it trims a six-part process to two steps, offering the possibility of tripling production capacity in an existing facility. In collaboration with another spinoff, Inpria (www.inpria.com), the center has broken a barrier in high-resolution circuitry, going below the 20-nanometer scale and enabling computer chips to accommodate more functions at higher speeds.

These achievements reflect gains reported by Oregon State engineer John Wager, physicist Janet Tate, graduate student Randy Hoffman and other researchers as early as 2003. They noted that transparent thin-film transistors made of zinc oxide could lead to new kinds of liquid-crystal displays, the dominant type of flat-panel screen. In 2006, HP licensed the technology and has been developing applications in collaboration with OSU.

At UO in 2003, researchers in Darren Johnson's chemistry lab dis-

covered a solution-based process for making nanoclusters, leading to the possibility that new semiconductors could be made without hazardous chemicals. Jason Gatlin, the UO graduate student who discovered the process, instigated a new UO-OSU collaboration when he shared his findings at a conference sponsored by the Oregon Nanoscience and Microtechnologies Institute.

To attract more young scientists to their journey, CSMC students will begin working with Hermiston High School teacher Lisa Frye and her chemistry classes this fall. They will provide support, advanced instruction and resources to inspire high-school students to consider careers in science.

"What we're after over the next 10 years," says Keszler, "is to put the (industrial) ecosystem together that allows you to print electronics on flexible glass. They will be high performance, durable, and include applications such as solar collectors."

We've come a long way from the futuristic idea of hanging TV screens like paintings on the walls of our homes.



Chemistry

ACS NORM 2013

NORM 13 (The Northwest Regional Meeting of the American Chemical Society) was hosted by OSU Chemistry July 21-24, 2013. The NORM 13 Chair, Richard Nafshun, reported that 431 attendees participated in 21 symposia, numerous workshops, poster sessions, awards banquets, Pauling Collection tours, receptions, and meetings on campus. The American Chemical Society Northwest Board deemed the meeting a success and voted unanimously to have NORM again at OSU in 2018!



Chemistry

2013 North American Solid State Chemistry Symposium

Photos: TJ Mustard



The North American Solid State Chemistry Conference (NASSCC) was hosted by OSU June 23-26th, 2013 and was co-organized by Professor Mas Subramanian and Professor Doug Keszler. The conference was a great success, with approximately 180 participants traveling from the US, Canada, United Kingdom, South Korea and Bosnia. NASSCC is held semi-annually, the intent being to alternate with the Gordon Research Conference on Solid State Chemistry but differs from the GRC in the strong emphasis placed on providing young scientists the opportunity for oral presentations. Solid State Chemistry plays a vital role in the design of functional materials which

fulfill ever-growing societal needs; of particular interest are the materials that relate energy and the environment. The program focused on pertinent topics spanning the field of modern Solid State Chemistry; advanced synthesis and structural characterization, functional materials design for energy conversion, magnetic and dielectric materials and many other topics. The tremendous successes that were discussed through the preparation of materials with unique electronic, optical, magnetic and catalytic properties are a clear testament to the strength and significance of Solid State Chemistry to Materials Science.



2013 NORTH AMERICAN SOLID STATE CHEMISTRY CONFERENCE (NASSCC)
OREGON STATE UNIVERSITY, CORVALLIS, OREGON
JUNE 23-26, 2013

Chemistry

Vince Remcho Named Patricia Valian Reser Faculty Scholar

The inaugural Patricia Valian Reser Faculty Scholar is Vince Remcho, a professor of chemistry and materials science at Oregon State since 1998. Remcho holds adjunct appointments in Biochemistry & Biophysics and Industrial & Manufacturing Engineering.

The Remcho research group focuses on the design, fabrication and optimization of microfluidic analytical instruments, a multidisciplinary field using practical applications to design systems in which small volumes of fluids are used — such as on DNA chips, lab-on-a-chip technologies, and micro-propulsion technologies. The work is highly interdisciplinary and collaborative, involving part-

nerships in the physical-, life-, and earth sciences and engineering. Prof. Remcho has been recognized for research excellence through an NSF CAREER Award and the 2010 Milton Harris Award, and for teaching excellence via a College of Arts and Sciences Outstanding Teaching Award.

Remcho served as associate dean for research and graduate studies in the College of Science 2009-13, and as interim dean in 2012 and 2013.

Remcho is a member of the Oregon Nanoscience and Microtechnologies Institute (ONAMI), is past chair of the Oregon Section of the American Chemical Society (ACS), and served as advisor to the ACS Student Affiliates, which provided free chemistry demonstrations in local schools. He's an innovator who has co-founded two successful start-up companies built in part on OSU technologies invented in his laboratory: *Trillium Fiberfuels*, a cellulosic

ethanol firm, and *GeneSpace*, a synthetic biology start-up.

He has authored ten book chapters and more than 60 technical papers in the last ten years, and has presented over 50 invited lectures at Universities in the US and abroad and at national and international scientific meetings in that same period. He received his B.S. (Biochemistry) and Ph.D. (Chemistry) from Virginia Tech.

In 2011 Patricia Valian Reser established an endowment to support a faculty member in OSU's chemistry department. One of the university's most dedicated volunteers and impactful philanthropists, Reser is co-chair of the OSU Foundation Campaign Steering Committee, helping to guide the \$1 billion Campaign for OSU. Reser graduated from OSU in 1960 with a bachelor's degree in elementary education; she later earned a master's in special education at Portland State. Together she and her husband grew Reser's Fine Foods — she now serves as the company's board chair.



Walt Loveland Awarded 2014 Seaborg for Nuclear Chemistry

Professor Walter Loveland of Oregon State University is the 2014 recipient of the ACS National Award in nuclear and radiochemistry, the Glenn T. Seaborg Award. This award is given **“In recognition of his pioneering work on the use of radioactive beams for producing neutron-rich nuclei and his investiga-**

tions of heavy residues in nuclear reactions.”

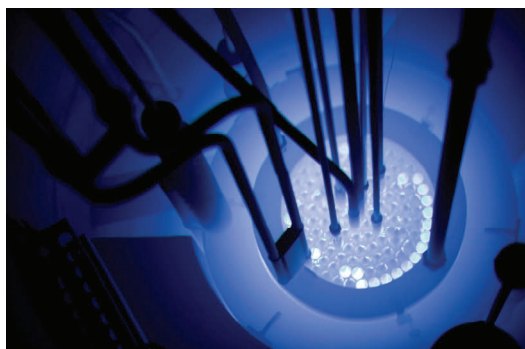
Walt received his SB in Chemistry in 1961 from MIT and his PhD in Nuclear Chemistry from the University of Washington in 1966. He's been on numerous Boards, including the ACS Division of Nuclear Chemistry and the NSCL Users Executive Committee. His

career awards range from an NSF Fellow to the FA Gilfillan Award for Research to APS Outstanding Referee. Walt is also a member of the ASE Mentor Hall of Fame.

Over his prestigious career, Walt had



supervised 9 PhD students, 15 Masters students, 26 Undergraduates and 14 High School students. He currently has over 190 publications on varying aspects of Nuclear Chemistry in print.



Chemistry

Excerpt from: Program Overview & Assessment Methodology for Online Instruction in Chemistry

By: Kim Thackray and Michael Lerner

Oregon State University offers a wide range of online chemistry courses. The courses are well subscribed, as of 2013 approximately 13% of our department's student credit hours were awarded in online courses, and both the online enrollment totals and the fraction of effort devoted to online instruction continue to increase. In this article, we describe the program history, provide detailed course offering descriptions, indicate student populations and our program-level assessment plan in the program. Program and course level assessment methodologies include collecting and evaluating both instructor and student feedback, adding learning analytics to course content for chapter and lab-level assessment data, and comparison of formal course outcomes.

As demand for online classes grows, more institutions will begin offering them, and advisors will be faced with the challenge of evaluating the quality of classes their advisees want to take. Criteria include:

- Classes offered by a well-respected public research university
- A strong history of successful teaching and learning
- Students have the support of an Ecampus department, which assists them with registration, proctoring, and other student needs
- A vigorous and expanding assessment pro-

gram to ensure that course outcomes are met and all delivery modes perform to our standards

Full text of this article can be found in Scholars Archive at the following address: <http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/42573/LernerMichaelChemistryProgramOverviewAssessment.pdf?sequence=1> Please contact Kim Thackray or Michael Lerner with any questions you may have.

Ecampus • OSU Degrees Online

Kim Thackray (kim.thackray@oregonstate.edu) is the Online Program Coordinator for the OSU Chemistry department. In this role, she works with students, faculty and OSU Ecampus to support current classes, facilitate development of new classes and ensure the ongoing quality of the student experience with Oregon State University.

Michael Lerner (Michael.lerner@oregonstate.edu) is a Professor of Chemistry at Oregon State University and director of the department's online educational program. His main research interest lies in developing new solid state materials with application in batteries and supercapacitors.

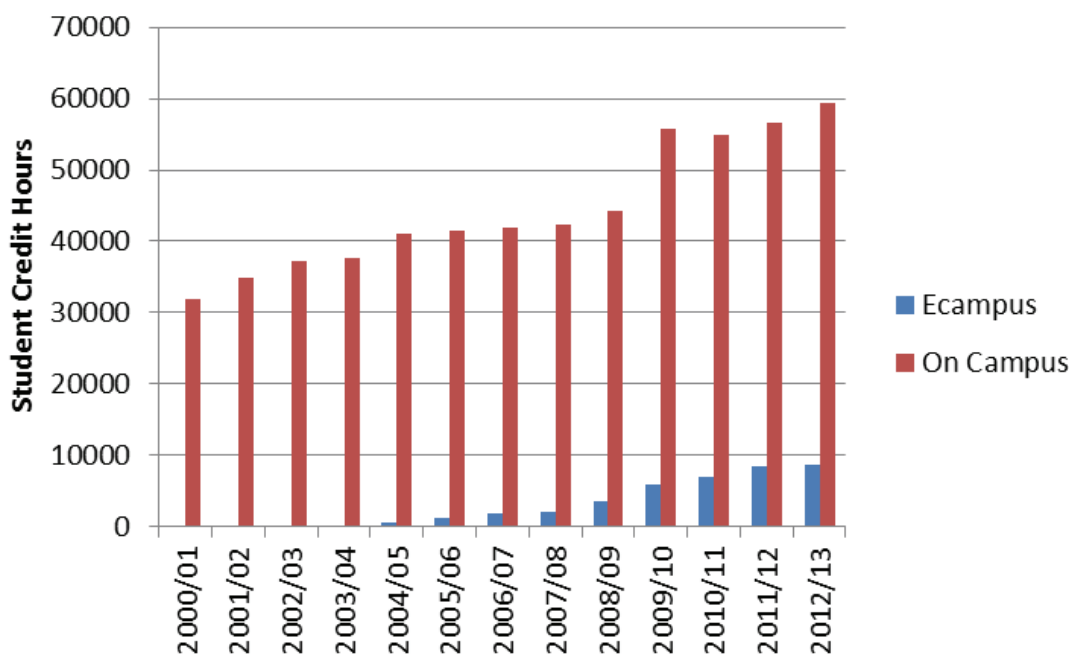


Figure 1. Student credit hours (SCH) in online and on campus chemistry at OSU for academic years since 2000/01.

Chemistry

Physical Chemistry Symposium at NORM 2013:

Novelty is Key

Chong Fang, Assistant Professor of Chemistry, OSU

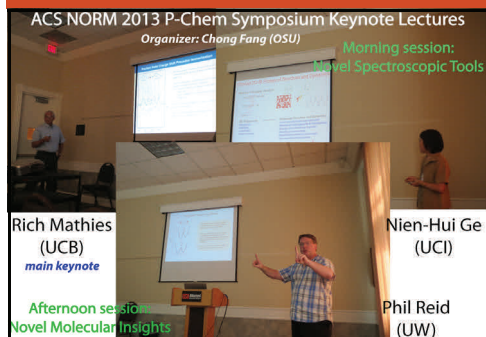


Fig. 1. Three invited keynote speakers delivered intriguing talks to a large NORM '13 audience. They brought the cutting-edge research advances to the meeting and showcased the capabilities of modern physical chemistry to tackle pressing scientific and engineering problems. The effective approach is both curiosity-driven and application-oriented.

Being the symposium organizer, I am glad that the three keynote speakers (Profs. Richard Mathies, Nien-Hui Ge, and Philip Reid of UW, see Fig. 1) as well as the other 12 speakers delivered stimulating talks to engage a large audience using the ACS NORM and OSU platform, to appreciate the beauty and impact of modern P-Chem education

The 68th Northwest Regional Meeting of the American Chemical Society (ACS), NORM '13, was held on the OSU campus from July 21–24, 2013.

The Physical Chemistry Symposium at the ACS NORM '13 was successfully held in the Trysting Tree Room at CH2M Hill Alumni Center on July 22nd. The morning session of "Novel Spectroscopic Tools" featured an array of technological-advance-oriented talks from invited speakers and renowned spectroscopists such as Richard Mathies from UC Berkeley, and Nien-Hui Ge from UC Irvine. Postdocs and senior graduate students from OSU Chemistry and other prestigious institutions in the Pacific Northwest and neighboring California, e.g., UO, UW, PSU, and Stanford/SLAC National Accelerator Laboratory have given presentations covering the broad electromagnetic spectrum from infrared, visible, ultraviolet, all the way to the X-ray regime. After the lunch break, the afternoon session of "Novel Molecular Insights" featured a variety of presentations on using innovative spectroscopic tools, aided by advanced computations, to investigate the fascinating molecular world and reveal underlying mechanisms on various timescales. The recurring theme was functional materials with an inquiry-based mechanism-driven physical chemistry approach.

and research in the Pacific Northwest and far beyond (Fig. 2). We also had an ultrafast spectroscopy laser lab visit in the late afternoon, and my group members enjoyed talking with some of the symposium speakers about research and academic career (Fig. 3). Prof. Chuck Williamson from Willamette University commented, "The attendance was stronger than past NORM events, and I appreciated the good conversations that took place after each presentation and in the intermissions!" These positive feedbacks I received during and after the meeting have assured me that organizing such a symposium can be fun and rewarding at the same time. I might want to do it again in the near future!

Fig. 2. Snapshot of the Q&A session after one of the talks in the P-Chem symposium. Prof. Richard Mathies was asking a question. Prof. Chuck Williamson could be seen at the front row. The audience was actively participating in the discussion on the preceding talks.



Fig. 3. Two keynote speakers at the P-Chem symposium visited our ultrafast spectroscopy lab (Rm. 263) situated at the 2nd floor of LPSC. All the Fang group members were glad to interact with these leading spectroscopists in the field. (L-R) Weimin Liu, Chong Fang, Breland Oscar, Yanli Wang, Richard Mathies (UC Berkeley), Liangdong Zhu, Longteng Tang, and Nien-Hui Ge (UC Irvine). The speakers were impressed!



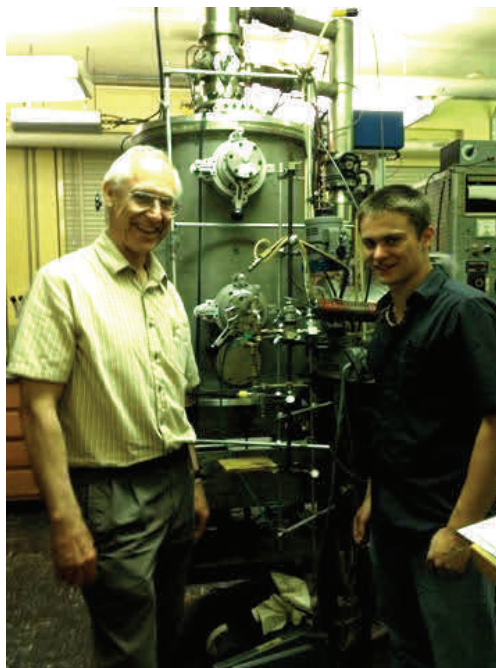
Chemistry

Joe Nibler Awarded 2012 Senior Scientist Mentor Award

High-Resolution Infrared and Coherent Raman Studies of Novel Molecules— This project will allow student participation in the synthesis and spectroscopic analysis of radialene-3, radialene-4, and prismane, all organic molecules with high ring strain and interesting bonding. The goal is to obtain vibrational-rotational spectra at state-of-the-art resolution (0.015 cm^{-1}) and to analyze complex spectral patterns to obtain accurate molecular parameters. As part of the research, students will obtain laboratory experience with organic synthesis in making these compounds and will carry out spectroscopic and electron diffraction experiments to determine their physical properties. The results will serve as useful new tests of predictions from theoretical *ab initio* quantum calculations at the anharmonic level.

With previous Dreyfus Foundation support, a number of undergraduates in Dr. Nibler's lab have managed to synthesize and study several novel small organic ring compounds of structural and spectroscopic interest.

Each molecule is simple and highly symmetric, yet relatively unstudied since none is commercially available and all are non-trivial to synthesize. Perhaps the most interesting of these is propellane, in which the unusual central bond remains the subject of much discussion and theoretical calculation. With undergraduate participation, we have now published three papers on the spectroscopy of this molecule, with one other paper accepted and another in preparation. From determination to the B_0 and the C_0 rotational constants, the length of the unusual axial CC bond in propellane has been determined to be $1.586277(3)\text{ \AA}$. Other publications include two papers on the closely related molecule, bicyclopentane and one on spiropentane, with at least one more paper to come.



Chemistry Ecampus exhibits at NSTA Conference

The Chemistry department believes that there is a population of potential students for the CH 12xe online series that we are not currently reaching—that of highly motivated high school students. The Chemistry Department Advisory Board also emphasized the potential for this market during their annual visit.

In an attempt to reach these students, Chemistry Ecampus exhibited this April at the National Science Teachers' Association (NSTA) National Conference in San Antonio, TX. Dr. Marita Barth (Instructor) and Kim Thackray (Chemistry Ecampus Coordinator)



staffed the OSU booth. They talked with high school teachers from all over the nation, making sure the teachers understood how our online Chemistry classes could help their high-level students reach their

educational goals. Students who would benefit from taking our General Chemistry classes might be:

- at high schools without chemistry classes or with limited chemistry offerings.
- at high schools without AP (Advanced Placement) or IB (International Baccalaureate) chemistry classes.
- at high schools that offer AP/IB classes, but students want/need flexibility, prefer the online mode, or want a college course in addition (summer prior to college).

Teachers were especially interested in learning that their students would pay in-state tuition for our online classes, no matter where they live. Dr. Barth and Ms. Thackray talked with over 400 attendees of the conference, creating awareness of OSU's online chemistry program and obtaining contact information from those most interested. Ms. Thackray will continue to monitor student registrations to determine the effectiveness of this outreach.

Chemistry

Maduka Ogba wins 2013 Herbert Frolander Outstanding Graduate Teaching Assistant Award.

Nicholas Larkey, Melissa McIntosh, Maduka Ogba, Subrata Shaw and Yuanyuan Wu all received the 2013 N.L. Tartar Summer Research Project Support Award.

Spencer Barrett, Clement Bomnier, Weekit Sirisaksoontorn, Peng Zhao and Naga Veerasamy all received the Milton Harris Summer Fellowship.

Jaeseok Heo received the Hedberg, Dandeneau, Chemistry and Johnson Fellowship.

Hanyang Zhang received the Ingram Award for Outstanding 1st Year Graduate Student.

Yunteng He and Fangyuan Han both received the Ingram Fellowship for Outstanding Graduate Students.

Yunteng He received the Benedict Award for Outstanding 2nd Year Graduate Student.

TJ Mustard and Whitney Schmidt received the Shoemaker Award for Outstanding Advanced Graduate Students.

Michael Hughes, Chadd Armstrong, and Derek Franco received the Peter B Culter Memorial Scholarship.

Dakota Backus, Tainqi Zhang and Gillian Downey received the Carroll DeKock Scholarship.

Nathan Martchenko received the Milton Harris Scholarship.

Josh Holmes and Corinne Brucks received the Linda May Oleson Scholarship for Excellence in Chemistry.

Kristine Nguyen and Jamy Lee received the Colleen Spurgeon Scholarship.

Samuel Kowash and Young Ha Rhee both received the CRC Award for Outstanding First Year Chemistry Student.

Jamy Lee received the PLU Award for Outstanding Second Year Chemistry Student.

Jacquelyn Helm received the Analytical Chemistry Award for top Junior student.

Matthew Stolt received the Inorganic Chemistry Award for top Senior student.

Jason Nikkel received the American Institute of Chemists Award.

Arsalan Zolfaghari received the Hypercube Award.

Elise Cowley received the Merck Award.

Oleksii Motorykin awarded the C. Ellen Gonter Award in the Environmental Chemistry Division.

Dylan Fast received a 2013-14 Provost's Distinguished Graduate Fellowship.

Weekit Sirisaksoontorn awarded 2013-14 Oregon Lottery Graduate Scholarship.

Leah Chibwe received a KC Donnelly Externship Award from NIH.

Neal Sleszynski promoted to Senior Instructor. Congratulations Neal!

Marshall Young awarded a 2013 Summer URISC for research in Prof. Chris Beaudry's Lab.

Wei Kong and Joe Beckman receive inaugural Ideas to Impact Award from COS.

Jeff Gautschi and Pat Ball receive TRF grant to install advanced digital tech at OSU-Cascades Campus.

May Nyman awarded 3 year DOE Basic Energy Sciences (Materials Division) Program entitled "Fundamental ion-association and acid-bas behavior of aqueous species: Unprecedented perspective from anomalous solubility."

Provost **Sabah Randhawa** has named Professor **Vincent Remcho** the inaugural Patricia Valian Reser Faculty Scholar in recognition of his considerable achievements at OSU.

Victoria Tran received the DeLoach Work Scholarship.

2013 Milton Harris Graduate Teaching Awards were presented to **Rosa Grajczyk, Quamar Salih, and Yanli Wang** at the Fall Picnic on October 4th.

Christine Pastorek received the 2013 Milton Harris Faculty Teaching Award.

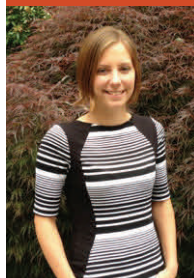
2013 Staff Service Awards were presented to **Mark Warner, and Kim Thackray.**

Mas Subramanian was awarded the FA Gilfillan Memorial Award for Distinguished Scholarship in Science.

Daniel Myles received the Fred Horne Award for Excellence in Teaching Science.



Undergraduate of the Quarter (continued...)



Shelby Paulson - Undergraduate of the Quarter, Spring 2013

Shelby Paulson grew up in Coos Bay, OR – graduating from Marshfield High School where she was a three-sport athlete (cross-country/track, basketball and swimming). Her senior year, she was awarded an Air Force ROTC Scholarship, which covered much of her cost to go to college. Military service is a tradition in her family as both her parents were in the Army. She selected OSU for college because her mom got her Masters degree from here and because "she didn't want to go to that school in Eugene." Her favorite courses were the Integrated lab sequence because it was "lots of fun and hands on." She also really enjoyed Staci Simonich's CH 692 Environmental Transformation of Organic Compounds course and Jennifer Field's Toxicology course. She has worked in Staci's lab for over a year now and has really valued the experience. She has also been active in the Student Alumni Association

during her time at OSU. After graduation, she will start her six-year service as an Air Battle Management Officer in the Air Force. We are fortunate to have talented students like Shelby in our Department, and we are grateful for her service to our country!

Chemistry

2012-13 Honor Roll

Fall 2012

Amanda Abbott
Corinne Brucks
Kali Burkhardt
Tora Cobb
Shannon Davis
Andrea Domen
Mai Duong
David Encke
Mitchell Farghar
Derek Franco
Elizabeth Gass
Laura Hale
Jacquellyn Helm
Timothy Hemphill
John Hergert
Joshua Holmes
Michael Hughes
Thomas Ketsdever
Jennifer King
Kevin Kovalchik
Jamy Lee
Stephanie Lilly
Ezri Martinez
Sarah Melancon
Kristine Nguyen
Jason Nikkel
Jackson Olson Dougan
Shelby Paulson
Jordan Rains
Ryan Rains
Bryan Rogers
Jenna Schardt
Connor Smith
Nathan Stencil
Nathan Stephon
Matthew Stolt
Halley Todd
Joshua Windheim
Arsalan Zolfaghari

Winter 2013

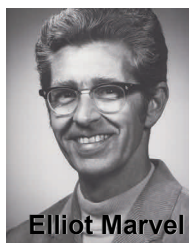
Dakota Backus
Kayla Bell
Scott Belozor
Luke Brenneman
Kristen Brewster
Corinne Brucks
Kali Burkhardt
Tora Cobb
Mark Delgado
Andrea Domen
Gillian Downey
Mai Duong
Brandice Durfee
David Encke
Derek Franco
Mackenzie Frey
Elizabeth Gass
Laura Hale
Benjamin Hamel
Jared Harzan
Jacquellyn Helm
Timothy Hemphill
John Hergert
Joshua Holmes
Jennifer King
Kevin Kovalchik
Jamy Lee
Sara Melancon
Kristine Nguyen
Philip Nguyen
Kyle Packan
Shelby Paulson
Ryan Rains
Elyssa Ridinger
Nathan Stephon
Ryan Stiegler
Matthew Stolt
Halley Todd
Anthony Vieira
Josh Windheim
Tianqi Zhang

Spring 2013

Nicolas Abayare
Chadd Armstrong
Dakota Backus
Kayla Bell
Scott Belozor
Monica Best
Corinne Brucks
Tora Cobb
Mark Delgado
Andrea Domen
Gillian Downey
Stephen Duda
Brandice Durfee
Derek Franco
Timothy Hemphill
John Hergert
Joshua Holmes
Michael Hughes
Adam Huntly
Ashley Kastner
Jacob Kaufman
Trevor Kawamoto
Kevin Kovalchik
Joshua Laird
Jamy Lee
Stefan Lucchini
Sarah Melancon
Arica Nassar
Dang Nguyen
Kristine Jguyen
Philip Nguyen
Kyoo Park
Lars Paulson
William Ping
Philip Prater
Jordan Rains
Ryan Rains
Nathan Stephon
Ryan Stiegler
Halley Todd
Tianqi Zhang
Arsalan Zolfaghari

Alumni Visitors

James Platt and his wife visited OSU Chemistry on June 26. James is a 1970 graduate of Professor Elliott Marvel's lab. He went on to a successful career in the pesticide industry with Chevron in California. He is now retired but is still active in outreach within his community through the organization Action Network and as a long term substitute in the local schools. We always enjoy when our alumni stop by!



Elliott Marvel





Department of Chemistry
Oregon State University
153 Gilbert Hall
Corvallis, OR 97331



INCLUDE OSU IN YOUR WILL OR TRUST

It's **easy** to make a difference for future generations by including the OSU Foundation in your will or trust. Oregon State set you on the path to success. **Why not give back?**

Contact us for a free Guide to Wills or for more information on including the OSU Foundation in your planning documents.

Julie Irmer • OSU Foundation, Office of Gift Planning
800-336-8217 • Gift.Planning@oregonstate.edu
campaignforosu.org/giftplanning