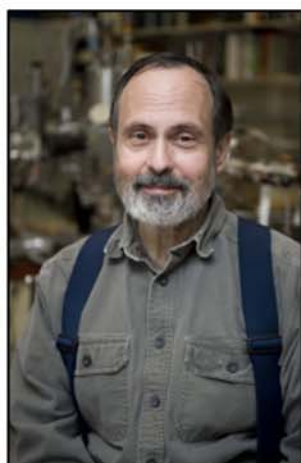


# CHEMISTRY NOTATIONS

A publication of the Chemistry Department at Washington State University  
2015

## A Message from the Chair:



Greetings ChemCougs! 2014-15 is drawing to a close on the calendar, but it is still going full blast in the department. We continue to add new faculty and to replace and add staff. Reading through the pages of this newsletter will introduce you to Dr. Paul Buckley (general chemistry), Dr. Krista Nishida (general chemistry), Dr. Amy Nielsen (general chemistry), Dr. Rock Mancini (organic chemistry), Lucas Bonner (main stockroom), Andrea Dodge (main office), and Stacie Olsen-Wilkes (grad recruiting). They are all excellent additions who will make this department better.

Unfortunately, we must also say goodbye. A particularly sad parting was the death of Jim Satterlee. He was an exceptional teacher and a fine scientist. He will be sorely missed. Less painful, but still difficult, is the fact that Carrie Giovannini has left her long-occupied graduate recruiting job to follow her dreams and become a nurse. While not strictly a chemistry staff member, a long-time friend in the Dean's office, Joanne Harkins, retired this year. And then we have those who are only kinda-sorta gone. Herb Hill and Rob Ronald have assumed 50% positions in a phased approach to retirement.

We have again been authorized to search for two faculty members in 2015 – An inorganic chemist (any flavor) at the assistant professor level, and an associate or full professor of nuclear chemistry. For the inorganic position, we are looking for a person who will complement current activities in the department and who will help us strengthen the inorganic division. For the nuclear chemistry search, we are scouring the country trying to find someone with an established reputation who wants to aggressively build

their career and our extremely strong program in radiochemistry. If you are aware of any excellent candidates that fit either description, please point them our way. Professor Ken Nash is chairing the nuclear chemistry search and Professor Scot Wherland is chairing the inorganic search.

As you look through the pages of this newsletter (thanks to Chelsea Gao for putting it all together!), you will see that the department has been very busy and very successful at all levels. Awards for undergraduates, graduates, faculty, and staff abound. The large number of new grants only scratches the surface because there are even more three and five-year continuing grants not listed. Our efforts to bring new technology into teaching are requiring extra effort from both the faculty and staff, and I really appreciate the work that Scot, Aurora, Greg, and Krista are doing to make this happen.

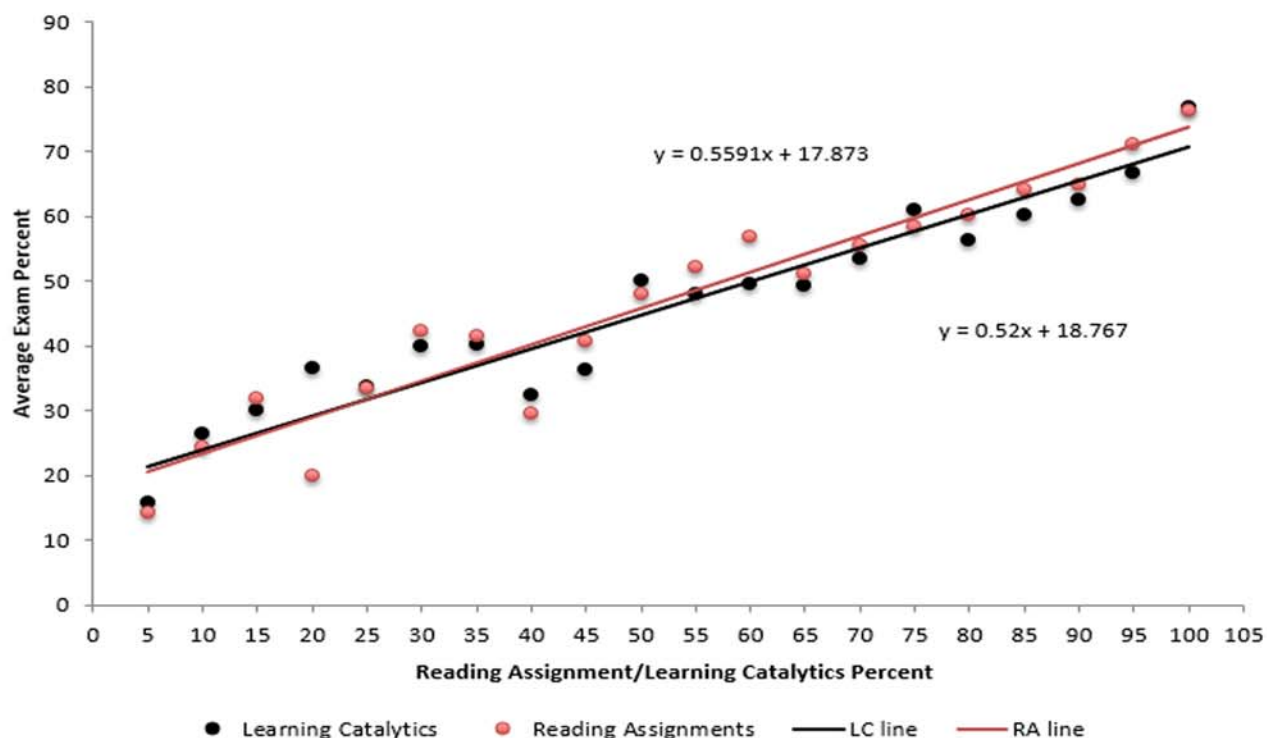
Last time, I mentioned the possibility of a Troy remodel. Well, it looks like it is really going to happen! Chemistry will get about 2.3 floors of the remodeled four-floor building. This will be a Chem 410 lab and research space for four synthetic chemistry research groups -- most likely two organic and two inorganic faculty members. My Ouija board is saying doors open in early 2017. The Old Fulmer and Fulmer Annex remodel have not progressed, and at this point, I am fairly doubtful they will happen soon. What we really need is a completely new building (Old Fulmer was completed in 1936, Fulmer Annex in the 60's, and our "new space" in 1990). Last year I told you it was impossible. This year, I am not so sure...

If you have anything you would like to share, we now have a Facebook presence. Please join our page at <https://www.facebook.com/ChemistryWSU?fref=ts>. Please feel free to post, or email me or Andrea Dodge ([andrea.dodge@wsu.edu](mailto:andrea.dodge@wsu.edu)) to share your news with other ChemCougs.

Best wishes,

KW Hipps, Distinguished Professor and Chair

# “Semi-Flipped” General Chemistry



Average Exam Percent vs. Total Reading Assignment Percent and Total Learning Catalytics Percent.  
- from undergraduate Adrienne Atzmilller's Chem 495 poster

This year, aided by funding from the Provost's Office, we tried a somewhat different approach to teaching our large General Chemistry classes, in particular Chem 105 in the Fall and Chem 106 in the Spring in the Pit. A principle goal of the approach is to incorporate more problem solving during the lecture time. In order to have time for this aspect, the students must come to class having read the material ahead of time. Our approach was only “partially flipped” as a “fully flipped” approach would have no lecture during the class time, with recorded lectures and reading assignments replacing live lectures.

In order to encourage the students to come to class prepared, we assigned a few homework problems (designed to be less than 30 minutes of work) to be done before each lecture. These were designated as Reading Assignments and along with the longer weekly Homework Assignments, were done through an online system that accompanies the textbook. With these systems the students get immediate feedback and grading of their work. The instructor could then check how well the students performed on these questions, and adapt their lecture accordingly. The lecture then summarized the material. We still found it useful to present the material in lecture, both for those students who learn better from an oral presentation and to provide emphasis on the more difficult aspects. Instead of doing examples as part of the lecture presentation, we then used another online system to do problem solving with the students.

To see the questions and submit answers the students con-

nected with their phones, laptops, or tablets through the Wi-Fi in the classroom to another online product. We could monitor their answers, coach them through the problem, and adapt the questions we asked to any difficulties they were having or move on quickly to more difficult problems. The weekly Homework Assignments then followed up with the more difficult problems, as the basics were covered in the Reading Assignments and the In-Class problems. All aspects, Reading, In-Class, and Homework problems, earned points for the students and the grading was done by the online systems.

The approach appears to have been a success. Attendance was more regular, students came to lecture already having thought about the days topics from the Reading Assignment, and they stayed engaged through the In-Class problem solving. The points they earned on these assignments correlated strongly with the exam grades, students who participated and earned points in the Reading and In-Class work, as well as the more traditional Homework, did better on the major exams that still represented half of the points available in the course.

Many people worked on this project. Dr. Krista Nishida, who earned her Ph.D. with Profs. Hippius and Mazur, started preparing for the Fall semester last summer when we developed a lecture-by-lecture schedule for the coverage and Reading Assignments. Although the Reading and Homework questions could be selected from a large collection of well-developed problems provided by the pub-

lisher, the problems delivered in class had to be written in the separate system used for that part of the course. She also helped with the student responses, as students were working with a variety of devices in the Pit, and each had its idiosyncrasies. The students would have been much less happy with the system if there were more technical problems, or if we could not help them overcome the issues that did arise. In the Fall Prof. Aurora Clark and I taught separate lectures, and in the Spring Prof. Brian Clowers and I were the lecturers, with continued help from Dr. Nishida and, of course, Nikki Clark in the General Chemistry office and Ryan Rice as lab supervisor.

*Written by Professor Scot Wherland*

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## Chemistry Welcomes New Staff Members!

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### Lucas Bonner – Stockroom Attendant

“My name is Lucas Bonner. I am a stockroom attendant 2 and work in the Fulmer basement storeroom. I am originally from Orofino, Idaho. Home of the Maniacs. I am married to the world’s most wonderful woman and we have two amazing children together. In my free time I enjoy snowboarding, hiking, fishing, concerts, and spending time with my family.”

### Andrea Dodge – Program Assistant

“I joined WSU and the Chemistry Department in February. As a Program Assistant my role varies from day to day, I spend a great deal of time compiling information about the departments past and present as a means to effectively communicate our accomplishments across the internet. I am the voice behind our Facebook page & website, and enjoy witnessing the excitement those from the department have towards its activities. I have a propensity for knowledge, while distracting at times, it has introduced me to many of my hobbies which are reading almost anything, shooting pool, creating things from nothing, and summarizing myself in list form.”

### Krista Nishida – Project Associate

“I’m a WSU Chemistry alumni who got my PhD with the Hipps-Mazur group in May 2011. I am currently working on both general chemistry course curriculum development and on curriculum development for our teaching assistants in order to improve our student success rate in the general chemistry courses. I’m an avid knitter, enjoy coffee and playing video games.”

### Stacie Olsen-Wilkes – Graduate Academic Coordinator

“In March, I became the Graduate Academic Coordinator. I am here to assist new and current chemistry graduate students from admissions to graduation, as well as, faculty and staff support. Before joining the Chemistry Department, I was in the WSU Registrar’s Office for nine years. My husband and I ventured from Wyoming

in 2005 and only this year have we bought a house in order to root ourselves in Pullman. I hope to spend at least another 10 years in Pullman and with WSU.”

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## Chemistry Welcomes New Faculty!

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### Amy E. Nielsen

“I will be arriving at Washington State University from Southern California after completing my stint as a visiting assistant professor of organic chemistry at Loyola Marymount University in Los Angeles. My research interests involve solid state photochemistry and applications in photodynamic therapy for cancer. In my free time, I enjoy spending time outside going hiking, running, and enjoying nature.”



### Paul T. Buckley

“I’ve been teaching chemistry at LCSC (Lewis-Clark State College) for the past eleven years, and am excited to take on new challenges in teaching General Chemistry at WSU. I’ve been living in Pullman for a while now, and certainly won’t miss the commute to Lewiston. On a personal note, some of my favorite activities include playing guitar and camping with my terrific thirteen year old daughter.”

### Rock J. Mancini

“I will be arriving at Washington State University from sunny Southern California after completing my postdoctoral experience at the University of California, Irvine. Research in my laboratory will focus on taking an organic polymer chemistry approach to the development of next generation immunotherapies and solar cells. In my free time, I enjoy rowing, marathons, and rock climbing.”



## GCS: The Next Generation



The “graduated cylinder” has been passed down from former Graduate Chemical Society President Greg Brabeck to the new officers of the 2015-2016 school year.

President: **Paige Lathem** (Heiden Group)

Vice-President: **Chris Veldhuizen** (Wall Group)

Treasurer: **Kelsey Morrison** (Clowers Group)

Secretary: **Rocio Rodriguez** (Heiden Group)

### Awards:

Teaching Assistant of the Year: **Sam Battey** (Peterson Group)

“Unlike most of us, he looks forward to office hours.”

Research Assistant of the Year: **Bo Peng** (Xian Group)

“He has co-authored 11 papers, with 4 as the first author.”

## Staff Recognition

**Michelle Leusink**, teaching assistant, was honored at the second annual Faculty and Staff Appreciation Day ceremony with the Outstanding Staff Member Award.

**Lori Bruce** was awarded for Outstanding AP Staff by the College of Arts and Sciences.

As principal assistant for the Department of Chemistry, Lori Bruce provides key administrative and organizational support for a diverse and growing research enterprise.



## Post Graduation Highlights



**Bryan Wiggins, 2013: Chair, K.W. Hipps**

Bryan has been named a University of Chicago Provosts Postdoctoral Scholar.

Bryan Wiggins earned his Ph.D. in Materials Science and Engineering from Washington State University in 2013. His dissertation, “Structural and Electronic Properties of Porphyrins and Phthalocyanines Self Assembled on Conductive Surfaces” focuses

on understanding the molecular and electronic properties of organic nanostructures and thin films by utilizing various material characterization methods. He employed advanced surface sensitive microscopy and spectroscopy techniques to carry out his investigations. The molecules of interest are potential candidates for active materials in optical, electronic, and energy devices. Bryan has conducted technical presentations at regional and international conferences and authored/co-authored several journal articles. He recently published a portion of his dissertation studies (J. Phys. Chem. C, 2014, 118, 4222-4230.).

Bryan was the recipient of numerous fellowships and awards during his graduate tenure including: National Science Foundation’s Graduate Research Fellowship Program, Alternate Sponsored Fellowship at Pacific Northwestern National Laboratory, Outstanding Graduate Seminar Award, Washington State University’s Center of Materials Research Scholarship and the Abelson Scholarship from the College of Arts and Science at Washington State University.

During his time at the University of Chicago, he will expand his research by exploring gas phase reactions at the surface interface on various substrates. He will assemble a one of kind instrument to combine his current expertise with a supersonic molecular beam apparatus to perform novel surface catalysis.

**Bryan Shaw, 1999: Chair, Jim Hurst**

Bryan Shaw has gained national attention for his work to develop a free smartphone app that can warn parents of a white glow in a child’s eye that may signal retinoblastoma. Bryan’s first son, Noah Shaw, lost an eye to the rare eye cancer as a baby.

Looking back, he found the first instance in a photo of Noah at 12 days old. “That’s when I realized that parents need help,” Shaw said. If there were some software available alerting parents of white eye in a picture, it wouldn’t go overlooked.

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## Faculty Awards and Highlights

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**Cliff Berkman** was awarded the 2014 Meyer Distinguished Professorship by the College of Arts and Sciences.

**Cliff Berkman** has been selected to receive an award of \$45,000 from the FY2015 Commercialization Gap Fund.

**Cliff Berkman** discovered an imaging agent that homes in on prostate cancer and will begin being developed for human clinical trials thanks to a two-year \$2 million federal Small Business Innovation Research grant.

**Aurora Clark** received the Mid-career Achievement Award by the College of Arts and Sciences.

Aurora Clark has garnered an international reputation for her creative and interdisciplinary approach to solving complex chemical problems. She is pioneering the use of network analysis algorithms to quantify and understand intermolecular behavior; more than 100 researchers around the globe are using at least one of her three software programs to study phase chemistry and molecular dynamics. She is also a dedicated educator and recently collaborated with Scot Wherland to increase student engagement in high-enrollment general chemistry courses by developing interactive, real-time learning modules.

**Aurora Clark** has been named interim director of the Materials Science and Engineering program.

**Sue B. Clark** has been elected as a member of the Washington State Academy of Sciences.

**Brian Clowers** received the Early Career Achievement Award by the College of Arts and Sciences.



Working at the intersection of chemistry, mathematics, and technology, Brian Clowers is enhancing the understanding of complex chemical systems. He is a recognized expert in the field of ion mobility, with an exceptional scholarly record and three licensed patents based on his work. In his short time at WSU, he has assembled a promising research team focused on the effective detection of molecules at trace levels. His practical experience and a genuine enthusiasm for science contribute to his success in the classroom.

**Greg Crouch** has successfully administered Blackboard, an online learning management system for the University.

**Kerry Hipps** has awarded a \$522,000 grant from the M.J. Murdock Charitable Trust, to be shared with the Voiland

School of Chemical Engineering and Bioengineering to help purchase X-ray and UV photoelectron spectroscopy instruments found nowhere else in the Pacific Northwest.

**Kerry Hipps** was awarded the 2014-2017 Westinghouse Distinguished Professorship in Materials Science and Engineering by the College of Arts and Sciences.

**Jeffrey P. Jones** was awarded the Ralph G. Yount Distinguished Professorship in Chemistry.

**Jeremy Lessmann** received the Excellence in Support of Undergraduate Research award by the College of Arts and Sciences.

**Alex Li** was invited to give a talk at the 2015 Gordon Research Conference in Easton, MA.

**Ken Nash** was awarded the Sahlin Faculty Excellence Award for Research, Scholarship and Arts.

**Kirk Peterson** has been elected as a Fellow of the American Chemical Society.

**Louis Scudiero** was recognized for his contributions as a faculty mentor in the Team Mentoring Program within The Office of Multicultural Student Services.

**Scot Wherland** received the Mentoring award by the College of Arts and Sciences.



The driving force in general chemistry instruction for the past decade, Scot Wherland's open style and experience are valuable assets for the department, college, and the University. His ability to guide, inspire, and support his colleagues provides both continuity in the classroom and opportunity for growth across all ranks of faculty.

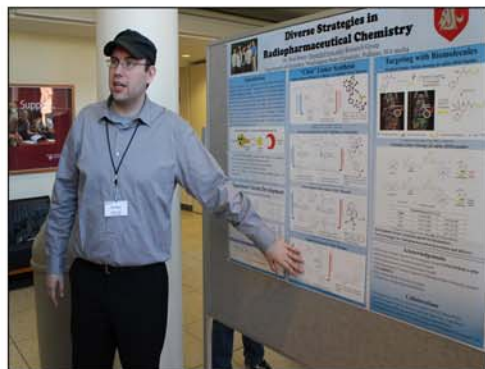
**Scot Wherland** was awarded the 2014-2015 Boeing Distinguished Professorship in Science/Math Education by the College of Arts and Sciences.

**Nathalie Wall** has been approved for promotion to Associate Professor with tenure effective Aug 16, 2015.

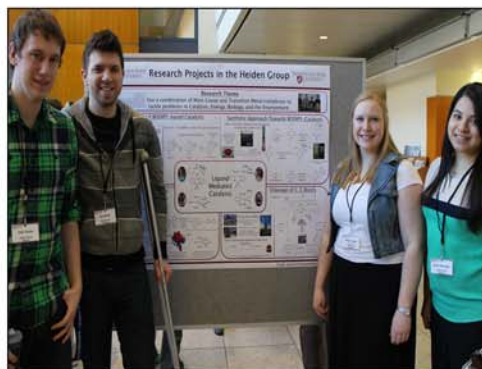
**Ming Xian's** research was showcased at the WSU Innovation Open House held by the WSU Foundation Annual Meeting of the Board of Trustees.

**Ming Xian** has been approved for promotion to Full Professor effective August 16, 2015.

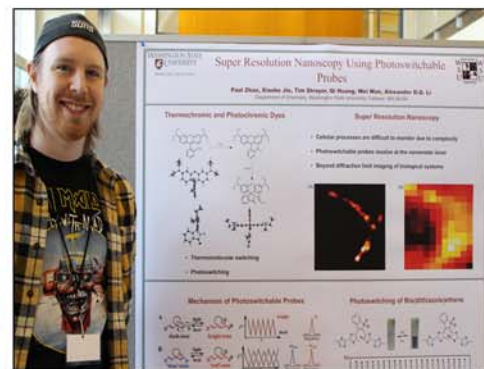
# Graduate Student Poster Session Prospective Graduate Student Weekend



Thomas Hayes (Benny Group)



Heiden Group: Nick Treich, Ben Rinne, Paige Latham, and Rocio Rodriguez



Tim Strayer (Li Group)



Nash Group: Devon Dodd, Nic Uhnak, Ben Tokheim, Ian Hobbs, Guy Dutech, and Jeff Berry



Peterson Group: Qing Lu, Sam Battey, and Rulin Feng



Wall Group: Chris Veldhuizen, Kevin Swearingen, Mitchell Friend, (prospective student), Joelle Reiser, Thibaut Martin, and Thomas Lemesle (post-doc)

## Chemistry Events 2nd Annual Carl M. Stevens Lecture, Puget Sound Women Chemists Retreat, Ralph Yount Distinguished Professorship, CAS 3-Minute Thesis Challenge



Jim Brozik, Stephen Sligar, and Jeff Jones



Kanika Choughule, Carlo Barnaba, and Stephanie Conn



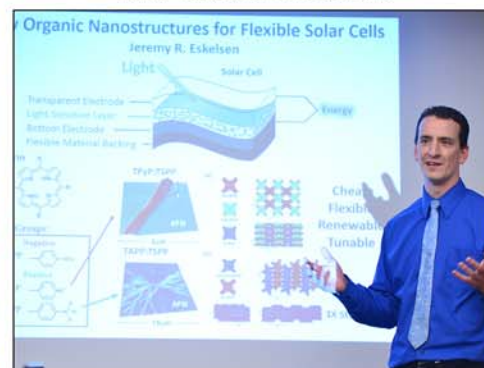
Larissa Gribat, Katherine Donahoe, and Ursula Fittschen



Jeff Jones receiving the Ralph G. Yount Distinguished Professorship in Chemistry



Larissa Gribat  
*Immobilizing Nuclear Waste*



Jeremy Eskelsen  
*New Organic Nanostructures for Flexible Optoelectronic Devices*

## Graduate MVP's



**Abrey Monreal** (Saludes Group) received the 2015 Ph.D. Student Achievement in the Sciences Award by the College of Arts and Sciences.

Co-author of four papers in his first two years of graduate training, Abrey Monreal is pursuing the design, synthesis, and characterization of sialic acid-derived peptides, and holds a provisional patent on the compositions and uses of SialoPen for intracellular delivery of anticancer agents. He received a Gordon Research fellowship to present his findings at the international Seminar on Chemistry and Biology of Peptides in California, and recently published a paper in *Chemical Communications*.



**Morteza Adinehnia** (Hipps Group) became an ambassador for science when a former WSU scientist brought his family in for a tour of Fulmer Hall.

“Thank you very much for your kindness in sharing your time and your enthusiasm with me, my wife Marilyn, and our two grandsons Alex and Sam, the scientists of the future! We had a great time at WSU and our visit with you and the wonderful tour of Fulmer Hall you conducted with labs and classrooms and the stockroom was the best part of our visit. We asked the boys last night their favorite part of the WSU visit and both said it was the “chemistry building” (by way of perspective, we also took them to Martin Stadium, Ferdinands, and to see the grizzlies).” – Calvin Delegard



**Brian Hauck** (Hill Group) won 1st place in the College of Arts and Sciences 3-Minute Thesis Challenge and competed in the university-wide finals.

“My research involves decreasing the false alarm rates of field deployed systems that use ion mobility spectrometry (IMS) for national defense purposes. I’m doing this by building my own accurate IMS instrument that has increased the accuracy of measurement by an order of magnitude and then building a reference database of compounds of interest. Any award, whether it’s the Fowler scholarship or from the competitions, is always helpful in using it to travel to conferences to present my research and gain more networking in my field. So I’m very thankful to the chemistry department, the GPSA, and the College of Arts and Sciences.”

## Undergraduate MVP

Brianna Berg’s success headlines the WSU.edu homepage!



We proudly present our Chemistry Club president, Brianna “Bree” Berg. Actively involved in the chemistry department’s undergraduate league, Berg works closely with her lab supervisor, assistant professor Jonel Saludes, and Chemistry Club advisor and instructor, Michael Finnegan.

She describes the Chemistry Club activities involving students of all ages.

“We put on science demonstrations for them that are very visually engaging, with lots of big bangs, lots of pretty colors, to pique the students’ interests at a young age so they are reminded that chemistry can be fun,” she says.

Last year Berg was one of 10 students nationwide selected by

the American Association for Cancer Research to receive the Thomas F. Bardos Science Research Education Award, an honor recognizing the potential of exceptional next-generation scientists. Saludes initially suggested that she apply for the award.

“When he presented this to me, it seemed like such an unattainable goal that I could possibly win an award like that,” she says.

Winning the Bardos provided Berg the opportunity to travel to the AARC’s annual meeting in San Diego last April. This year she’ll travel to Philadelphia to share her progress.

“All of these people have immeasurably added to my success. They’ve provided valuable insight because of their experience. And my career goals have been driven a lot by the influence of these people. I do not think I’d be as successful without them.”



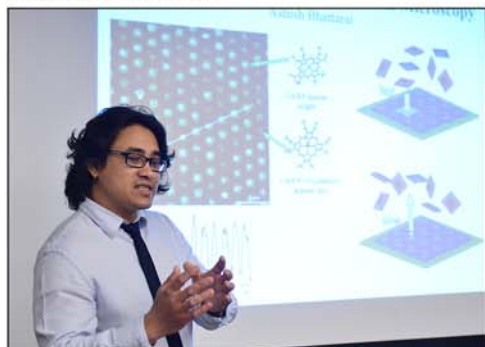
**Dr. Michael G. Finnegan**

# Graduate Student Scholarships and Awards

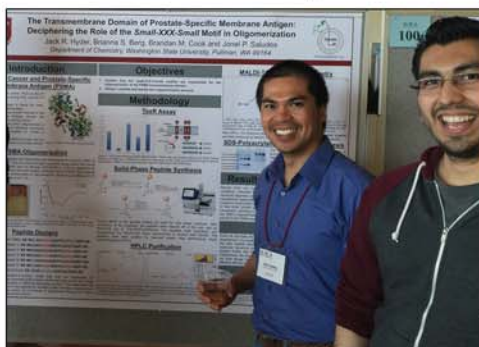
**Ashish Bhattarai** (Hipps/Mazur Group), **Bryan Borders** (Hipps/Mazur Group), and **Greg Brabeck** (Reilly Group) won the Richard R. and Constance M. Albrecht Scholarship in the amount of \$1,500 each.

**Shalina Bottorff** (Benny Group) was awarded the Boeing Graduate Fellowship in Environmental Studies in the amount of \$3,000 by the College of Arts and Sciences.

**Greg Brabeck** (Reilly Group) has won the Best Student Paper Award for his publication in the International Journal of Mass Spectrometry. Greg will receive a \$500 travel grant to attend the ASMS Symposium in St. Louis where he will receive a certificate at the award ceremony and \$1,500 from Thermo Fischer.



Ashish Bhattarai



Jonel Saludes and Erik Contreras



Mirissa Smith, Shalina Bottorff, and Tom Hayes

**Brian Hauck** (Hill Group) won 1st place in the Engineering and Physical Science category of the Wiley Research Exposition.

**Thomas Hayes** (Benny Group) won the TJ Chow Fellowship in the amount of \$1,000.

**Ryan Joseph** (Garner Group) won the Gardner Stacey Fellowship in the amount of \$1,000.

"The project I am working on in the Garner lab is the development of chemical methods for synthesizing Glycopeptides. This award was a wonderful surprise and was used to support my presentation of our work at the 284th national ACS meeting in San Francisco!"

**ChulHee Kang** was awarded a Schenk travel grant which provided for his entire group of students to travel to Corvallis to attend the Northwest Crystallography Workshop at Oregon State University.

Sam Jun, Kevin Lewis, and ChulHee Kang



**Ben Kasten** (Fall 2014 Graduate - Benny Group), won the Matteson Fellowship in the amount of \$500.

**Morgan Kelley** (S. Clark Group) and **Adam Burn** (Nash Group) won the Matteson Fellowship in

the amount of \$1,000 each.

**Erik Contreras** (Saludes Group) was awarded first place and \$250 at the NIH Symposium Graduate Student Competition.

**Brandan Cook** (Saludes Group) was awarded a Schenk travel grant in memory of Jim who encouraged and invited Brandan to join our graduate program in 2011.

"The purpose of my attendance at the ASEMV conference at Asilomar, Pacific Grove, CA was to present my work on exosome purification using rationally designed peptides that possess high affinity for lipid membranes. Presenting at this conference allowed me to gain exposure in a public forum as well as gain valuable insights from colleagues in my field of research from around the world."

the amount of \$1,000 each.

"My research involves studying actinyl cation-cation complexes in mixed-solvent media, which is relevant to used nuclear fuel reprocessing applications. The award has helped further motivate me to work diligently as a chemist." – Adam Burn

**Abrey Monreal** (Saludes Group) was awarded the American Peptide Society Travel Award.

**Desiree Mendes** (Berkman/Black Group) won the EL Wagner Fellowship in the amount of \$1,000.

"My research entails building small molecule agents for detection and fusion proteins for targeted therapy of metastatic and aggressive cancer types. This award helped me by alleviating part of the mandatory fees required for graduate students to pay each semester."

**Lindsey Neill** (Wall Group) won the Ruck Graduate Fellowship in the amount of \$1,500.

"Being awarded the Ruck Fellowship helped me tremendously with relocating to France to complete a nine month internship at a French national

Pete Reilly, Morgan Kelley, and Greg Brabeck





lab. The support of the Ruck Fellowship, along with all my advisors and the staff at WSU, has allowed me to make the most of my time in France studying the durability of nuclear waste forms. I am confident my time here has given me the knowledge to reach my research goals at WSU and beyond.”

**Erickson Paragas** (Saludes Group) and **Carlo Barnaba** (Jones Group) won the First-year Student Award in the amount of \$1,250 each.

“My project is on sialic acid-derived cell-penetrating peptides under Dr. Saludes. I appreciate the department's efforts to recognize the hard work of the graduate students. After getting the award, it inspired me to continue persevering towards my graduate studies and research.” – Erickson Paragas

“I am working in Jones' Lab on the inhibition of cytochrome P450, a major class of drug-metabolizing enzymes, using a comprehensive approach which involves spectroscopy, computational as well as kinetic modeling, with the overall aim to improve in vitro/in vivo predictions. The award helped me not

only in a merely financial sense, but gave me also a further and positive push through my academic route.” – Carlo Barnaba

**Nic Uhnak** (Nash Group), **Bo Peng** (Xian Group), **Kevin Lewis** (Kang Group), **Brian Hauck** (Hill Group), **Brandan Cook** (Saludes Group), and **Greg Brabeck** (Reilly Group) won the Frank Fowler Fellowship in the amount of \$1,000 each.

“My research focuses on the development of novel fluorescent probes for small biological molecules such as hydrogen sulfide and sulfane sulfurs. Both of them are important signaling molecules with potent cytoprotective actions in biological systems. I am also utilizing these probes to study the contributions of hydrogen sulfide and sulfane sulfurs to physiological and pathological processes.” – Bo Peng

**Jamie Weaver** (Wall Group) was awarded the Golding Family Fellowship for Women in Science and the WARIAC Research Fellowship by PNNL.

## In Loving Memory

**James D. Satterlee**, professor of chemistry and co-founder of the WSU Nuclear Magnetic Resonance Center, passed away on Sunday, June 22, 2014.

Trained as a biophysical chemist, Satterlee's primary research focused on the structure and function of heme proteins and heme enzymes—compounds like hemoglobin or catalase that carry out specialized functions. He was a leader in using nuclear magnetic resonance and mass spectroscopy to identify complicated protein structures. His interests included environmental chemistry, including converting algae into biofuel and analyzing the smoke from post-harvest agricultural field burning to determine its chemical constituents.

“Jim's work on magnetic resonance studies of heme proteins was considered to be the seminal research in the field,” said K.W. Hipps. “During the period from 2000 to 2006, his work was cited hundreds of times in biochemical literature.”

Satterlee was also a dedicated teacher. He taught freshman chemistry for more than 10 years and was particularly invested in the Honors chemistry course. In addition to identifying examples from current events and environmental issues to help his students connect to the coursework, Satterlee paid special attention to the math skills of his students and held an extra tutoring session nearly every weekend to support their success.



“He brought a unique perspective to the classroom and loved teaching,” said Jim Brozik. “He could have retired after his cancer diagnosis, but teaching was a big part of his life and he chose to stay involved.”

At the graduate level, students appreciated Satterlee's input and often requested to have him on their thesis committees.

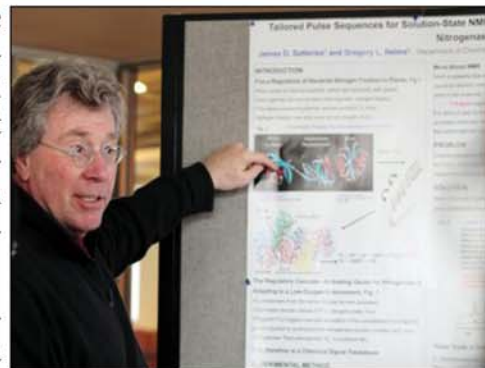
“He was an outstanding teacher, a creative researcher, and a kind individual who encouraged his colleagues in all domains,” said Kelvin Lynn, professor of physics and director of the Center for Materials Research, and one of Satterlee's collaborators at WSU.

Satterlee earned his bachelor's degree at Central Washington University and his PhD at the University of California, Davis, and completed a post-doctoral study at the California Institute of Technology. Early in his career, he was an Alfred P. Sloan Foundation Fellow and received a National Institutes of Health Research Career Development Award.

He joined the WSU faculty in 1989 and is survived by his wife, Sandra, and daughter, Ashton.

Professors Steve Alam, Gerd LaMar, Jim Hurst, and James Brozik spoke of Dr. Satterlee's life and achievements at his memorial reception in the CUB Junior Ballroom on October 16, 2014.

**Raymond Albrook**, chemistry stockroom manager from 1974 and 2006, died Oct. 1, 2014. “Everyone went to Ray for advice whether they were a student, TA or professor,” said Tom Martin, director of administrative services in the College of Arts and Sciences. “He was great to work with but had this dry sense of humor that would shine through when you least expected it. I will really miss him.”



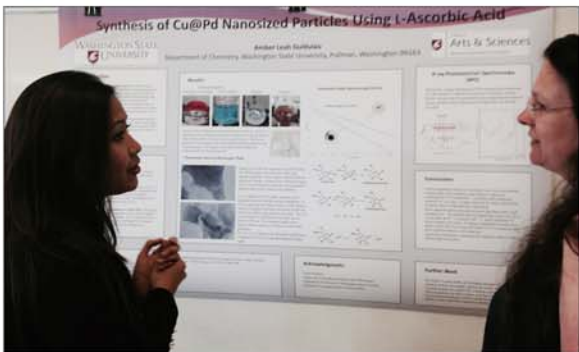
# Undergraduate Senior Poster Presentations

## Spring 2015

**Zachary Anderson** (Ryu, U of I) "Heat Stability of Ochratoxin A in an Aqueous Solution".

**Adrienne Atzmilller** (Wherland) "The Effectiveness of Online and In-Class Activities on Exam Performance in a Flipped Classroom Setting".

**Sophia Beyer** (Berkman) "Phosphoramidate-Based Peptidomimetic Inhibitors of Membrane Type-1 Matrix Metalloproteinase".



**Amber Duldulao and Aurora Clark**

**Amber Duldulao** (Scudiero) "Synthesis of Cu@Pd Nanosized Particles Using L-Ascorbic Acid".

**Braxton Fisher** (Scudiero) "A Soy-Protein Derived Solid State Electrolyte for Safer Lithium-Ion Batteries".

**Brett Johnson (Xian)** "Investigation of Reaction Selectivity between Sulfides and Persulfides".

**Alex McCue** (A. Clark) "Hydrogen Bond Dynamics at the Interface".

**Moises Morales** (Garner) "An  $\omega$ -Aspartyl Thioester Building Block for Convergent Glycosylative Ligation".

**Jason Toyoda** (Orr, Hu, and Syzmanski, PNNL) "Testing of Fluorescence in situ Hybridization Methods in Various Cell Lines".

**Slater Weinstock** (Jones) "Identification of an Animal Model for Human Aldehyde Oxidase and Generation of Metabolites by Peroxynitrite".



**Louis Scudiero and Braxton Fisher**

## Exceptional Undergrads

**Bree Berg** and **Jack Hyder** (Saludes Group) won the Crimson award in Molecular, Cellular, & Chemical Biology.

Title: *The Transmembrane Domain of Prostate Specific Membrane Antigen: Deciphering the Role of the Small-XXX-Small Motif in Oligomerization.*

**Bree Berg** has also received the Top Senior Award in the Academics by the WSU Student Alumni Ambassadors and Alumni Association. Way to go, Bree!

**Sophia Beyer** (Berkman Group) received the Norma Fuentes and Gary Kirk award for Excellence in Undergraduate Research by the College of Arts and Sciences.

**Alex McCue** (A. Clark Group) won



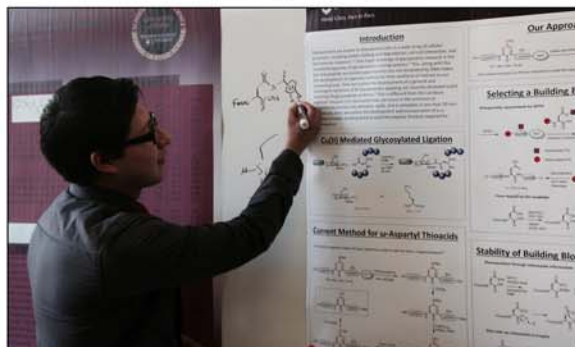
**Jack Hyder and Brianna Berg**

the Gray Award in Engineering & Physical Sciences.  
Title: *Hydrogen Bond Dynamics at the Interface.*

**Moises Morales** (Garner Group) was nominated by his mentor at WSU and recognized by the ACS as the most Outstanding Senior, Undergraduate Organic Chemistry Student. Moises was awarded one year of free membership to the ACS Division of Organic Chemistry. Congratulations, Moises!

**Ashton Powell** (Benny Group) won the Crimson Award in Engineering & Physical Sciences.

Title: *Enhancing the Reprocessing of Spent Nuclear Fuel; Ways to Recycle.*



**Moises Morales**

# Faculty New Funding—Award Totals for Calendar Year 2014

Total Grant Expenditures in 2014: \$6,613,069.20

**Cliff Berkman**, “Nanospring Platform for Affinity Capture of Tumor-Derived Exosomes”, \$106,893.

**Cliff Berkman**, “Development of a PET prostate specific membrane antigen imaging agent: Preclinical translation”, \$234,574.

**Cliff Berkman**, “Training in Biotechnology: Emphasis in Protein Chemistry”, \$437,615.

**Jim Brozik**, “Guide Star Imaging: Shedding Light on Ligand Gated Ion Channels”, \$190,147.

**Aurora Clark**, “The Center for a Nanoporous Materials Genome”, \$125,500.

**Aurora Clark**, “SISGR: Supramolecular Organization Within Electrolyte Solutions”, 160,000.

**Sue Clark and Aurora Clark**, “TERRAPOWER Sponsored Project Agreement”, \$15,592.

**Sue Clark and Aurora Clark**, “Recycling of used nuclear fuel: An experimental and computational investigation for removal”, \$568,624.

**Sue Clark**, “US-China Cooperation”, \$30,000.

**Sue Clark**, “Rapid, Ligand-assisted Capillary Electrophoresis Methods for Actinide Determinations by Mass Spectrometry”, \$191,199.

**Sue Clark**, “Electroanalytical Method Development to Support Post-Detonation Debris Analysis”, \$349,567.

**Sue Clark**, “Modern Integrated Radchem Techniques (MIRT) (HEAPA)”, \$22,000.

**Brian Clowers**, “Curriculum and Faculty Development on Technical Nuclear Forensics at Washington State University”, \$100,000.

**Phil Garner**, “Aziridine Mediated Peptide Ligation”, \$130,000.

**Herb Hill**, “Gastrointestinal Role of apoAV by Metabolomics of Fluids from Transgenic Mice”, \$75,000.

**Herb Hill**, “Chip based liquid phase ion mobility spectrometry”, \$25,000.

**Herb Hill**, “Evaluation of the Electrospray Ionization Ion Mobility Time-of-Flight Spectrometer”, \$3,020.

**Herb Hill**, “Development of a Breathalyzer for Drugged Driving”, \$83,409.

**Herb Hill**, “Reducing False Alarms in Ion Mobility Spectrometry Detectors”, \$199,946.

**Herb Hill and Nathalie Wall**, “Field detection and quantification of inorganic species from surfaces”, \$350,000.

**Kerry Hipps**, “Scanning tunneling microscopy of temperature dependent molecular processes at the solution”, \$430,000.

**Kerry Hipps**, “GAANN Fellowships for Advancing Materials Research, Education, and Teaching”, \$140,877.

**Jeff Jones**, “Understanding the Metabolic Impact of Aldehyde Oxidase on New Drug Design”, \$258,450.

**ChulHee Kang**, “Roles of calsequestrin in the control of calcium signals in health and disease”, \$123,231.

**ChulHee Kang**, “Forisome based smart materials”, \$50,000.

**Ken Nash**, “Studies on Minor Actinide Separations”, \$192,000.

**Kirk Peterson**, “Accurate ab Initio Thermochemistry and Spectroscopy of Molecules Containing f-block Elements”, \$125,000.

**Pete Reilly**, “Development of a Digital Ion Trap Mass Spectrometer for Resolved Mass Analysis”, \$322,897.

**Pete Reilly and Nathalie Wall**, “Fast Ultra-Trace Detection of Fission Product Relative Isotopic Abundances”, \$351,773.

**Louis Scudiero**, “Applying Abundant Plants to Develop Battery Materials and Benefits to the Agricultural Economy”, \$494,805.

**Nathalie Wall and Jeremy Lessmann**, “Inductively Coupled Plasma Optical Emission Spectrometer for Nuclear Energy-Related Teaching”, \$108,158.

**Nathalie Wall and Ken Nash**, “Managing Zirconium Chemistry and Phase Compatibility in Combined Process Separations”, \$189,583.

**Ming Xian**, “Chemical Approaches for Detecting S-nitrosothiols”, \$279,341.

**Ming Xian**, “Novel Sulfide Releasing Agents for Ischemic Injury”, \$419,690.

**Choong-Shik Yoo**, “Novel Nitrogen-rich Polymeric Phases at High pressures and Temperatures”, \$200,000.

**Choong-Shik Yoo**, “High-Energy-Density Monolithic Organometallic Solids”, \$150,000.

**Choong-Shik Yoo**, “Physical and Chemical Behaviors of Carbon-Based Volatiles”, \$44,800.

**Choong-Shik Yoo**, “Squeezing Simple Molecules to Novel Conducting Polymers”, \$150,000.

**Choong-Shik Yoo**, “Novel Low Z Extended Solids: A New Class of Energetic Materials”, \$1,303,819.

**Choong-Shik Yoo**, “Dynamic Responses of Reactive Metallic Alloys”, \$110,000.

**Choong-Shik Yoo**, “Awareness & Localization of Explosives-Related Threats ALERT”, \$75,000.

**Choong-Shik Yoo**, “Novel Structure, Strain and Stability of Low-Dimensional Carbon under Extreme Pressure”, \$54,766.

**Choong-Shik Yoo**, “Thermomechanical Reactions of Volatiles in Deep Earth Environments”, \$110,000.

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## Grad Students: The Next Generation

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The Chemistry Department is pleased to welcome 22 young scientists to our pool of hard working graduate students this year!

Alex McCue, May 2015 alumnus, also obtained his undergraduate degree in Chemistry from WSU. He says:

“I am looking forward to the transition from undergraduate research to graduate research as I will be able to do more than just analyze data that has been provided for me. I am looking forward to designing my own molecular simulations and learning more about the fundamental physical principles that govern the properties of liquids. There will be many more responsibilities that I will have to meet as well, but I believe that I am up to the task.”

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## Chemistry in the News

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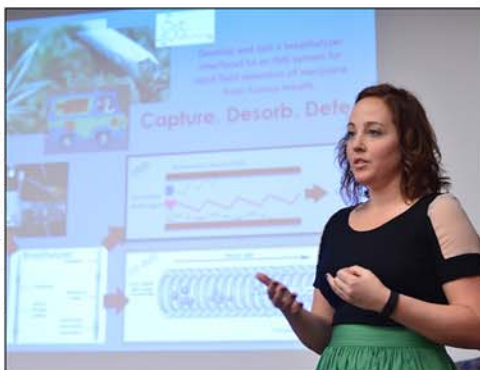
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*Breath test to detect pot is being developed at WSU:*  
**Herb Hill and Jessica Tufariello**

A team at Washington State University is working to develop a breath test that could quickly determine whether a driver is under the influence of marijuana.

Hill said he and WSU doctoral student Jessica Tufariello are working on a handheld device that uses a technique called ion mobility spectrometry to detect THC in someone's breath.

“WSU is going to be at the forefront, it seems to me, of supplying this kind of science and the technology that's based on it to police all over the country,” said Sen. Adam Kline, D-Seattle.



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## Donor Recognition

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The Chemistry Department at WSU is proud to be among your philanthropic priorities, treasure your benevolence, and promise to steward that responsibly and gratefully. Your generosity has been instrumental as we strive to fulfill our goal to have every student leave our department with a diploma in one hand and a job offer in the other.

- Together, you contributed a total of \$87,520 within the last fiscal year.
- Together, your gifts have allowed our students to attend national conferences, afford text books and supplies, and train under the top scientists in their field - nationally and internationally.
- Together, you and more than 85 donors made gifts between \$10 and \$25,000.
- Together, you continue to provide our students with the top-notch faculty, facilities, classroom education, instrumentation, and leadership opportunities that prepare them for both personal and professional success.

Thanks for having faith. Thanks for your support. Thanks for spreading so much good.

**Newsletter Note:** We're planning to add an itemized donor section in future newsletters. If you'd rather not have your name mentioned, please let us know by calling 509-335-5585 or emailing us at [chemistry@wsu.edu](mailto:chemistry@wsu.edu).

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Graduate and undergraduate alumni, we'd love to hear from you! Please write us at PO Box 644630 Pullman, WA 99164-4630, email us at [chemistry@wsu.edu](mailto:chemistry@wsu.edu), or Like us on Facebook (Department of Chemistry at Washington State University) and tell us what you've been doing since graduation!

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