



Message from the Chair



Jim Vyvyan

Another year gone by and a fresh crop of students sent out into the world. New discoveries made in the laboratory. People transition in and out of various roles in the university.

Chemistry is . . . well, technically, chemistry is the study of matter, but I prefer to see it as the study of change - Walter White, *Breaking Bad*, Pilot Episode

The largest change of the past year was the retirement of George Kriz after 47 years on the faculty of WWU – although it was still known as Western Washington State College when George arrived in 1967. His service to the department and institution through the decades is unparalleled, and we wish him well for a long and happy retirement (see article on pages 4-6 for further info). Two other faculty members moved on this year: Jeff Hurlbut retired after teaching general chemistry for 14 years in an adjunct role, and Mark Peyron transitioned to a tenure-track position in Engineering starting this fall. We are grateful for their dedication to the department and for the high-quality instruction that benefitted thousands of students.

The first faculty member hired as part of WWU's new Institute for Energy Studies, Tim Kowalczyk, will be based in the Department of Chemistry. Tim is a computational chemist, and we look forward to the expansion of this specialty on campus. Stacey Maxwell is our new program coordinator and the pleasant voice you hear when calling the main office. Carrie Annett rejoined the Department as department manager last fall. If that name sounds familiar, Carrie was a part-time fiscal technician with us for a few years about five years ago. Brandon Dietrich is transitioning to a teaching role after four years as the general chemistry laboratory coordinator. The general chemistry laboratories have undergone significant changes in the last few years as enrollments increased dramatically. Annual enrollment in Chem 121, for example, has increased 35% in the last 6 years and Chem 123 has gone up 53% over the same time period. Organic chemistry enrollments are up >40% since 2008, too.

We are also experiencing exciting changes at the college level, not the least of which is a name change. The former College of Sciences and Technology is now the College of Science and Engineering, reflecting the expansion of the Engineering Technology department to full-fledged Engineering. Leading CSE is our new dean, Catherine Clark, who took over that position August 1. Catherine is a physical chemist whose research has examined the photochemistry of organic material in the ocean. We are looking forward to working with Catherine on a number of initiatives, knowing that good things happen when one puts a chemist in charge!

In addition to our annual Scholars Week activities, we hosted the 2014 ACS Puget Sound Section Undergraduate Research Symposium. Amanda Murphy organized an outstanding meeting that boasted a record number of student presenters and attendees. This year we are proud to host the Pauling Medal Symposium honoring Professor Stephen Buchwald of MIT on October 11. David Patrick is the Award Chair this year and John Gilbertson and David Rider are Program co-Chairs.

Many of my faculty colleagues received external grants this year that will continue to provide the research opportunities that have become the cornerstone of our program. As always, we are most proud of our students' achievements in the classroom and laboratory, and I trust you will share our pride as you read about many of them in the following pages.

Cheers,
Jim

Inside:

Department Donors	2
George Kriz Retires	4
Alumni Spotlights	7
New Faculty and Staff	8
Memoriam	9
Faculty Promotions	10
Faculty Sabbatical	11
Research Spotlight	12
Grant Funding	13
Faculty Publications	17
2013-2014 Awards	18
Andrea d'Aquino	20
2013-2014 Graduates	21
ACS at WWU	22
Scholars Week 2014	24
ChemClub	26
Department Picnic	28
Conference Attendance	29



Thank You to Chemistry Department Donors

We wish to extend a special thank you to the following alumni and friends of the department who donated to the following Chemistry Department Western Foundation funds from June 2013 to June 2014.

Our program has grown, and your donations are more crucial than ever. Our Foundation funds support a variety of activities including student scholarships and academic awards, undergraduate summer research stipends, student travel to conferences, department seminars, equipment purchase and repair, and events for department majors and alumni. We need and appreciate your support!

If you would like to make a gift, please visit the website: www.foundation.wvu.edu or call (360) 650-3274.

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Ruth Watts Science Scholarship Endowment

Mary Jane and Richard Vetter

Lowell Eddy Memorial Fellowship in Chemistry

William and Trudy Kindler



George S. Kriz Retires after 47 Years at Western

Memoire by Gerry Prody

If you've been in or around the Chemistry Department at Western in the last 47 years, odds are you have made contact with George Kriz. Maybe he was your Chem 101 instructor. More likely, you at least connected with him through his very popular textbooks. If you were one of the lucky ones, George was your professor in one of the many organic chemistry classes he taught. Personally, I didn't have any of these interactions. George was on the faculty when I was hired in 1984, and he became my stalwart supporter and one of my best friends (right, George?).

George came to Western in 1967. He joined the Chemistry Department at the beginning of a large expansion from its origins in Old Main to its new home in Haggard Hall, where Chemistry occupied the second floor. At Western, George met Gary Lampman and they eventually hired Don Pavia, thus forming the inimitable PLK team (Pavia, Lampman and Kriz, for the uninitiated). They went on to write numerous textbooks and lab manuals, which attained large circulations and national acclaim.

Perhaps you were a student in one of George's early organic chemistry classes. Apparently, he was so appalled with how students performed on a particular exam, that he went out, bought black crepe paper, and stapled said crepe paper to each exam. If any on you were in this class, we would LOVE to hear from you.

If you took organic chemistry from George, you very likely remember his portrayal of the ammonia inversion. I've never seen it myself, but I'm told that George stood on one leg (the lone pair of electrons?) and moved his other leg and arms in front of his body and then behind his body in a fluid motion. Perhaps you were even there when he threw his back out trying to demonstrate this phenomenon. I'm told he never did it again after that...

George is also a consummate musician. Many of you will know of his long association with the Whatcom Chorale. In the Haggard Hall days, he organized a quartet of similarly minded chemists to sing for our annual Holiday Party. Membership varied, but included me as soprano, George's wife Carolyn as alto, Sal Russo (later replaced by Joe Morse) as tenor, and George Kriz as bass. We deliberated over what to call ourselves until George announced that we would be Tetramer. Perfect! Our gigs for this party continued until the party didn't happen anymore.

George is a person near and dear to every member of the Chemistry Department community. With Gary Lampman and Don Pavia, he has endowed a fund so that our Scholar's Week Symposium can occur long into the future. This, and many other generous acts, affirm that George has always cared greatly about the lives and academic successes of the students with whom he interacts. Although he is leaving his professorial duties in the department, he is retaining his position as the University's pre-healthcare professions advisor.

On the day of George's last lecture class, the faculty and staff of chemistry planned a surprise. We contrived to arrive midway through the class with champagne and hydrogen balloons/rockets. Stealthily, we approached the class, opened the door and...IT WAS EMPTY. He'd released his class early. Undaunted, we strode to his office en masse and then brought the celebration to our conference room. Leave it to George to thwart our surprise!

There was a little payback, however, the next week when George handed out his final exam in that last class: a student came up and reported that he'd just handed out the previous midterm ☺ OOPS. Fortunately, George is so loved by our department that less than 15 minutes later, with the aid of our office manager, academic coordinator, general chemistry lab coordinator, and whoever else was around, utilizing 3 printers, the final exam was distributed and all was well with the world.

George was blessed to have 2 retirement parties: one for the campus, and one at my house. In the interim, AND UNBEKNOWNST TO ME (for which I'll never forgive him), he purloined a huge chunk of sodium and threw it in Fischer Fountain on red square.

You can read George's biography on the next page. He is an amazing man. What the biography doesn't say is what a kind, funny, caring human being George is. I don't think there is anyone else alive who will miss him in the department as much as I do. He has already started celebrating his retirement by gallivanting around Italy, the lucky dog ☺.



George S. Kriz Retires after 47 Years at Western

George S. Kriz is a professor of chemistry at Western Washington University, where he was the recipient of the Peter J. Elich Excellence in Teaching Award for the 2000 academic year. He is also director of Pre-Healthcare Professions Advising. He is the co-author, along with Donald L. Pavia, Gary M. Lampman, Randall G. Engel, and James R. Vyvyan, of a series of highly successful organic chemistry textbooks. His publications include *A Small-Scale Approach to Organic Laboratory Techniques*, *A Microscale Approach to Organic Laboratory Techniques*, *Introduction to Spectroscopy*, and *Microscale and Macroscale Techniques in the Organic Laboratory*. Kriz has also published in several scientific journals. He is a member of the American Chemical Society, its Division of Chemical Education, and the Royal Society of Chemistry.



George Kriz was born to Mary L. Kriz (Semelka) and George Kriz in Santa Cruz, CA on October 20, 1939. He graduated from Santa Cruz High School in 1957. He received his BS degree in chemistry from the University of California, Berkeley, CA in 1961 and his PhD in physical organic chemistry from Indiana University, Bloomington, IN, in 1966. After two years of post-doctoral study at the University of Montpellier (France) and The Ohio State University (Columbus, OH), he moved to a faculty position at Western Washington State College (later Western Washington University), where he has been since 1967. Kriz's research interests include the application of spectroscopic techniques to the solution of structures of natural products, the development of new organic chemistry laboratory experiments, and the promotion of science literacy among the general public. Kriz was the general chair of the 17th Biennial Conference on Chemical Education, which was held at Western Washington University (Bellingham, WA) in the summer of 2002.

George married Carolyn Marjorie Anderson Leininger on August 25, 1989. They made their home in Everson, WA until Carolyn's passing in 2012. Since then he has been living in Bellingham.

George retired in June 2014 after 47 years as a member of the WWU faculty. Chief among George's retirement plans is to continue working with Western students through the Pre-Healthcare Professions Advising program. He also plans on remaining active in the Whatcom Chorale, a local classical choral ensemble, where he sings bass, and to continue to enjoy musical performances. Travel is another passion that he expects to enjoy, as well as golf and cooking. As an escape, he may frequently be found exploring the rugged coastlines of the Pacific Northwest, pursuing views of yet another interesting lighthouse, or suffering on the golf course.



'PLK'- Lampman, Pavia, Kriz



Faculty celebrating with George after his last organic chemistry lecture



George S. Kriz Retires after 47 Years at Western

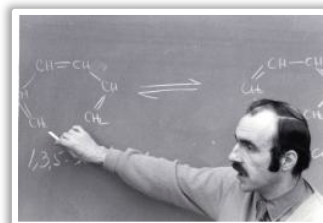
Quotes from students about George

"Professor Kriz, you are a fantastic teacher. You are one of a select few professors who can teach such a large class and still make it feel like a small classroom environment. Never have I had a professor who is so clearly in love with what he does."

Anonymous

*"If anyone were to sit in on one of his courses, they would be able to tell that he doesn't talk **to** his students, he talks **with** them, interacts with them, and has all the patience in the world . . ."*

Rianne BeCraft



George teaching circa 1973



George's "Commandments of Organic Chemistry"

"Your smile and the memories of numerous explosions will fondly stay with me forever. Thank you for being such a great teacher and a great person for so many."

Sara Champoux

"Prof. Kriz brought the material to life. Though the material was extremely challenging and extensive, his ability to describe reactions in simple statements was outstanding. I remember my friends and I sitting everyday at the small table outside his office in the chemistry building, pouring over our problem sets, popping in and out of his office with questions for hours. Never one to give an answer away, he would have us explain our process to him, guiding us to right our own mistakes and see alternative methods on our own."

Sesha Hanson-Drury

"Although Dr. Kriz is retiring this spring the hundreds of students he taught are just beginning their careers. I can only hope that in my career I'm able to impact so many people. Thank you Dr. Kriz for being such a wonderful teacher, and for inspiring me to pursue my career in science."

Sara Smith

"Dr. Kriz, you have taught me many invaluable lessons in and out of chemistry, and there is not one lesson that overshadows another for it is the collective whole that makes you as a teacher, as a mentor and as a friend so unique. I only wish more Western students could have the pleasure of learning from you."

Zach Thammavongsy



Nicole Koeppen, George Kriz, Michelle Wuerth, Alicia Mangubat (2013)

"I graduated from medical school yesterday and reflected on all of the people who made a difference for me along this journey. Dr. Kriz was a part of that journey in helping me reach my goals. I know he has done this for many of my friends who are now successfully pursuing careers in various fields of science. As I prepare for starting my own career, I am very thankful to the foundations of my education at Western and the role Dr. Kriz played in it during his incredibly successful career."

Shanley Besett Deal



Alumni Spotlights

Bob Matson

On May 15, 2014, Bob Matson ('69 and '71) received the distinguished alumnus award from the College Of Sciences and Technology. While at Beckman's Advanced Technology Center, he was instrumental in the development and commercialization of DNA arrays for clinical diagnostics. He later did research involving protein arrays. This work resulted in the development of one of the first microplate-based multiplexed immunoassays later commercialized in the A² MicroArray system. He is the founder and current president of QuantiScientifics that offers products and services based on inventions and new technologies developed by Bob and his colleagues. For a more complete description of his illustrious career, consult the alumnus spotlight section of the Spring 2011 newsletter at:

<http://www.chem.wvu.edu/dept/alumni/ChemNews2011.pdf>

Bob was accompanied by his wife Jeanne, son Erik, and daughter Jacqueline at the alumni awards ceremony. In addition, he met on May 16, 2014 with faculty who had been his mentors when he attended WWU (see photo). He also observed the poster session that is part of Scholars Week.



Bob Matson receives a Distinguished Alumni award



Gary Lampman, John Whitmer, Don Pavia, Bob Matson, George Kriz, and Sal Russo.

Jennifer Novotney



Jennifer receives the award at the ACS meeting in San Francisco

Jennifer Novotney, a Chemistry Department alumna, won the Chemistry Champions competition at the American Chemical Society (ACS) national meeting in San Francisco in August. The goal of the competition was to promote effective communication of scientific topics to non-scientists. Jennifer was chosen from 27 finalists who submitted short, non-technical videos on their research (<https://www.youtube.com/user/AmerChemSoc/playlists>). Jennifer spoke on the importance of polymers to everyday life and her research using polymer materials to detect substances like TNT. Ten semi-finalists were chosen to attend the ACS meeting and give presentations to a live audience, who then voted for the winner. As part of the prize, Jennifer will receive a paid trip to Washington, D.C. to tour ACS headquarters. In addition, she will host an upcoming ACS Reactions webinar and will be a featured speaker at The Science and Entertainment Exchange event organized by the National Academy of Sciences, where she will share chemistry research insights with members of the entertainment industry.

Jennifer graduated from WWU in 2010 with a double major in mathematics and chemistry. While at WWU, she was a member of David Patrick's research group and was the co-president of the ChemClub. She won numerous awards including the 2010 Presidential Scholar Award for the College of Sciences and Technology. Jennifer is currently a graduate student in the laboratory of William Dichtel at Cornell University, where she is working to develop conjugated porous polymers for explosives detection.



New Faculty and Staff

Tim Kowalczyk

Tim Kowalczyk joined the department in June 2014 as an assistant professor with joint appointments in the Institute for Energy Studies and AMSEC. Tim is originally from the Boston area but was lured west to study math and chemistry with support from the University of Southern California. He discovered a passion for quantum chemistry while learning how to predict the optical rotation of chiral molecules during a summer Research Experience for Undergraduates (REU) program at Virginia Tech. Continuing computational research at USC during the year, Tim seized another summer REU opportunity synthesizing nanoparticles at the ENS Cachan in France. He maintains that the explosion instigated by a colleague in that lab is unrelated to his decision to remain a computational scientist.



As a graduate student at MIT from 2007-2012, Tim specialized in computational models of electron transfer and developed density functional methods for excited states. On weekends, he was often in Philadelphia visiting his best friend and fellow USC alum Genette McGrew; they married in 2009.

Tim comes to Western on the heels of a Japan Society for the Promotion of Science (JSPS) postdoctoral fellowship at Nagoya University in Japan, where he expanded the toolkit of tight-binding models based on density functional theory to study structural and electronic properties of carbon nanomaterials and multifunctional organic dyes. He is excited to begin using these methods with research students at Western to develop predictive models of photostability in solar energy materials and to understand the factors driving self-assembly of organic frameworks. Outside of the lab, Tim likes finding ways to keep up his limited French and Japanese language skills. He is also an amateur keyboardist with a soft spot for video game music.

Spencer Berger



Spencer Berger joined the Department of Chemistry as an Instructor in the fall of 2013. She grew up in Austin, Texas, and attended Cornell University, where she double majored in biology and chemistry. Spencer then attended graduate school at UC Berkeley, where she obtained a master's degree in chemistry. She is currently finishing her graduate work in science education with Prof. Angelica Stacy.

Spencer is glad to be a part of the department and the greater Western community. Her favorite part of her job is getting to interact with interesting and bright students on a daily basis. When she is not teaching or working on her dissertation, Spencer enjoys running, swimming, and cooking.



New Faculty and Staff (cont.)



In the past year there have been some big changes in the front office. The Chemistry Department is very pleased to welcome back Carrie Annett (fiscal assistant 2004-2009) as our department manager. Carrie has a long history with Western Washington University as a student and employee. She graduated in 1994 with a Bachelor of Arts in Economics and a minor in Business Administration. After graduation, she began working for WWU and has held positions in Associated Students, Elementary Education, Chemistry, and Administrative Computing.



Carrie Annett

Carrie has been married for 18 years to her husband Aaron, a commercial fisherman in Alaska. Their son Noah is a junior in high school. When she has free time, she enjoys traveling and watching Noah play lacrosse. Her favorite vacation spot is Kauai. This fall her family is trying a new destination and plans to visit Puerto Aventuras, Mexico.

Carrie is pleased to rejoin the Chemistry Department and see all the familiar and new faces. The growth in the department since 2009 is quite impressive. Her previous work experience in Chemistry and WWU have been a tremendous asset as she has transitioned into her new role.

Stacey Maxwell took over the position of Project Coordinator in the Chemistry Department in May 2014. Most of her professional career was in the medical field until she began working at Western in Business Services as Procurement Support in January 2012. She found that she loved working for Western and was quite excited to be afforded the opportunity to experience the academic side of things and to work with students in the Chemistry Department. She definitely feels right at home here and anticipates enjoying many years to come!

Stacey has twin daughters age 16 and a son age 2 who are "the light in her life". She enjoys spending time with family, writing, music/singing, and photography (in the broadest most amateur sense of the term!). She was born and has lived in Bellingham the majority of her life, with the exception of 3 years spent in central Texas.



Stacey Maxwell

In Memoriam: Pat McIntyre

Pat McIntyre died on April 1, 2014. As a faculty member in the Chemistry Department from 1970-1975, he pioneered bringing computers into the classroom. With his family, "Dad" and "Papa" shared his passions for Christmas, camping, biking, Disneyland, spaghetti with meatballs, Big Macs, magic tricks, and poker. He had a gift for photography where he captured moments with his family and the natural beauty that surrounded him. Running was a solitary pleasure that helped to keep him going through much of his long illness in his later years. Pat is survived by his wife of 57 years, Joan McIntyre, and his loving family.



Faculty Promotions

John Gilbertson

In spring 2014, John Gilbertson was promoted to associate professor. Since joining the Chemistry Department in 2008, he has actively involved undergraduate students in his research program. He has mentored nineteen undergraduates, two summer REU students, and two master's students on different research projects. One of his undergraduate research students, Michael Pegis, was the Chemistry Department's Outstanding Graduate, and the WWU Presidential Scholar from the College of Science and Technology. Virtually all graduates from his group have been accepted to either graduate or professional school.



His research is focused in areas of societal advancement, including carbon dioxide utilization and solar energy harvesting. He has served as the Principal investigator (PI) or co-PI on six externally-funded grants bringing in \$1.7 million in research funding. This includes a prestigious 5-year Faculty Early Career Development Award from the National Science Foundation. He has published seven papers, five with WWU undergraduate co-authors. He is involved in two patent applications that are based on his collaborative work with luminescent solar concentrating technologies. John has presented his work at multiple national American Chemical Society meetings and Gordon conferences. He is currently the graduate program advisor for the chemistry graduate program. He is also on the executive committee for the Advanced Materials Science and Engineering Center (AMSEC) and has served on multiple other departmental committees. John is also heavily involved in outreach for the community and has spearheaded an initiative to develop a television program titled Scientist Citizen, which is aimed at informing the public on local scientific issues.

Sergey Smirnov

Sergey Smirnov came to Western in fall 2008. Since then, he has taught multiple classes including general chemistry, NMR methods, biochemistry, and biophysical chemistry. While teaching was initially quite challenging, he gradually learned how to engage students in class and challenge them with appropriate quizzes, homework, and exams. Now he particularly enjoys optimizing the lecture content, crafting new exam/homework questions, and working with individual students during office hours.

Sergey's research group uses nuclear magnetic resonance spectroscopy (NMR) combined with general biochemical approaches to investigate site-specific information about the structure, dynamics, and function of modular proteins. He has obtained several grants from both external and internal sources including the National Science Foundation, Russian Ministry of Science and Education, and Research and Sponsored Programs at WWU. His research activity has resulted in publication of three peer-reviewed papers on the structure, dynamics, and function of protein and DNA samples with six WWU research students as co-authors.



Faculty Promotions (cont.)

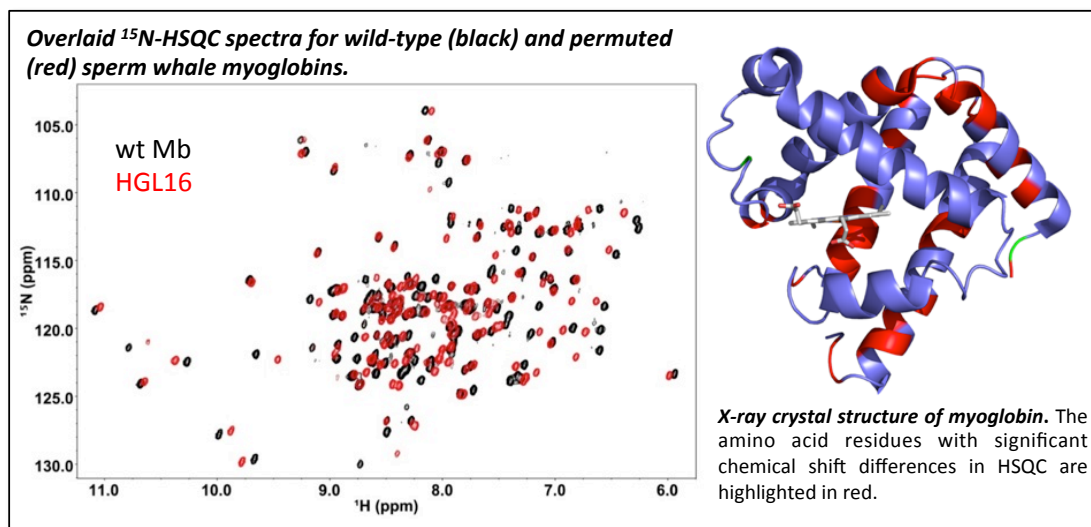
Additionally, his students have presented posters at national meetings including the Protein Society, Experimental NMR conference, and several regional symposia. Students that have graduated from his group have obtained desired positions in academia, the biotechnology sector, or medicine.

Sergey has served on several departmental committees and the university-wide Faculty Development committee and the Faculty Union committee. He also serves the broader community as a reviewer for NSF proposals and biochemistry journal publications. He has judged several regional competitions in the K-12 educational system.

According to Sergey, "Tenure brings an understanding that more will be expected from me in all the three directions. At the same time, it means many new and truly exciting opportunities."

Faculty Sabbatical Highlight : Spencer Anthony-Cahill

Spencer Anthony-Cahill spent the 2012-2013 academic year on sabbatical in the lab of Rachel Klevit in the UW Biochemistry Department. He had the good fortune to work on a project that is a collaboration between the Klevit lab and the lab of WWU Biochemistry alumnus (Class of 1999) Joseph Mougous, who is an associate professor in the Microbiology Department at UW. Joseph was enrolled in the first biochemistry course Spencer ever taught at WWU in fall 1997. Spencer assigned the HSQC ("amide fingerprint") spectra for two proteases that are secreted by one type of bacteria to kill competing bacteria in the immediate environment. Understanding how these proteins are secreted, and what parts of the bacterial cell wall they attack will shed light on new ways to combat bacterial infection. Spencer learned to acquire, process, and analyze 2-D and 3-D protein NMR datasets, determine T1 and T2 relaxation rates, and dabbled in diffusion measurements. The skills learned in the Klevit lab have already borne fruit as Spencer was able to successfully guide his MS student Jim Hall through the assignments of HSQC spectra for wild-type and permuted myoglobins (see figure below). Jim plans to use these assignments to determine how permutation of the myoglobin affects the backbone dynamics of the protein.



Chem Graduate Student wins \$20,000 in Business Plan Competitions

For the last several years, Chemistry Profs. David Patrick, John Gilbertson, and Janelle Leger along with their collaborators in Math and Physics and a team at the University of Washington, have been developing new solar concentrators for producing solar energy. Earlier this year they filed a patent application for their invention, which Gilbertson describes as, “an exciting breakthrough in low cost, high performance solar concentrators.”

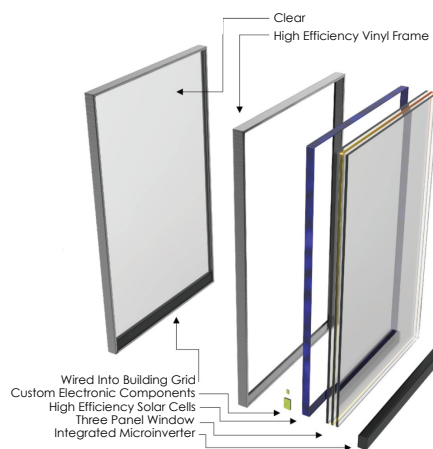
The device they’ve produced, called a luminescent solar concentrator (LSC), works by absorbing sunlight in a thin plastic sheet, where it becomes trapped and travels to the edges for conversion by attached solar cells. By replacing a large area of solar cells with comparatively inexpensive plastic, the cost of solar energy is reduced. According to Patrick, the major advance concerns the absorbing species used to harvest sunlight. He explains, “LSCs have been around since the 1970’s, but their efficiency at collecting sunlight has always been too low for practical applications. The main reason is that the luminescent dyes used for absorbing sunlight also turn out to be very good at absorbing their own light. This leads to repeated self-absorption of light travelling in the LSC, which catastrophically compounds what would otherwise be small losses.” The team says they’ve managed to solve this problem using a new class of dyes based on doped quantum dots, nanometer-sized semiconductor crystals containing low levels of certain impurity ions.

One of the students involved in the research, a chemistry graduate student Christian Erickson, thought the technology would be useful for making transparent window coatings, essentially turning windows into solar panels. Patrick agrees and adds, “I thought this would be a nice opportunity to assemble a group of students with different backgrounds and set them loose to try and translate the research into a real-world product.” So Patrick, along with WWU Business Professor Ed Love, put together a team of Western students from Engineering, Industrial Design, and the MBA programs, to work with Erickson on developing a prototype and a business plan.

The team, which called themselves Nova Solar Technologies, developed hypothetical sales marketing materials, a financial plan, and spent many long hours building a functioning prototype. Along the way the students met with potential investors, window and solar panel manufacturers, architects, and other professionals, gathering information and refining their designs. After many months of hard work, they produced a transparent window which, when placed in sunlight, could charge a cell phone through a small USB port.

The student team entered several regional business plan competitions, where, according to Patrick, “they did spectacularly well.” At the Environmental Innovation Challenge in Seattle, they won the \$5,000 Clean Energy Prize and took second place overall. In another competition sponsored by the Northwest Innovation Resource Center they took first place and another \$10,000, along with an offer to join the Center’s small business incubation program. In total, their awards added up to \$20,000 and they were featured in several news outlets including an interview on KOMO4 News and newspapers as far away as Korea.

What’s next for the team? Patrick describes this year as having provided a valuable learning experience for the students, which gave them a chance to see what’s involved in creating a new company. For now though, the students have set their sights on a new goal. They’ve been accepted into an EPA-sponsored competition to go head-to-head against top university teams from around the country in Washington, DC. If they can place among the top group they stand to win another \$75,000. Meanwhile, the university is looking into options for commercializing the research. Patrick concludes, “These students have done an amazing job. I can hardly wait to see what they do next.”



Student team members (left-to-right): Jim Kintzele, Blake Bishop, Christian Erickson, James Mather and Josh Bennett.



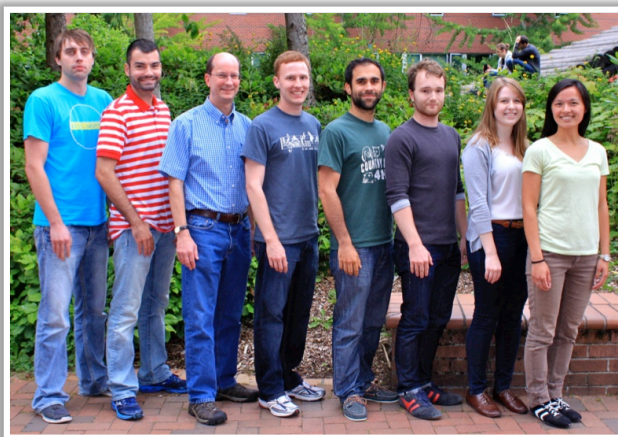
External Grant Funding in 2013-2014

Congratulations to the following chemistry faculty members who were awarded research grants in 2013-2014. ***This year our faculty members (along with some collaborators) brought in over \$3.3 million new research dollars to WWU to be spent over the next 3 years.*** This funding is critical to the growth of our department, and gives our chemistry students unique opportunities to participate in state-of-the-art research projects. A summary of the projects that received funding are given below.

Mark Bussell

Prof. Mark Bussell and collaborators Prof. Takele Seda (WWU Physics), Prof. Stephanie Brock (Wayne State University), and Prof. S. Ted Oyama (Virginia Tech / University of Tokyo) received a \$919,000 grant (\$319,000 to WWU) from the National Science Foundation to investigate the fundamental properties of a new class of nanoscale metal phosphide materials for the removal of sulfur, nitrogen, and oxygen impurities from petroleum and renewable bio-oil feedstocks. The aims of this project are to determine the roles of particle size, particle shape, and composition in determining the activity and selectivity of metal phosphide nanoparticles encapsulated in mesoporous oxide shells for heteroatom removal reactions. Each member of the collaborative team brings unique characterization capabilities for investigating the structural details of the well-defined metal phosphide nanoparticle catalysts. This research with core-shell nanocatalysts will enable the fundamental chemistry of nanoscale metal phosphides to be probed, providing new information for the improvement and commercialization of these promising catalysts.

Bussell Research Group



(Left-to-right): Sam Danforth, Boris Ilic, Mark Bussell, Ben Morgan, Bo Carrillo, Peter Topalian, Tess Clinkingbeard, Andrea d'Aquino

Emily Borda

Prof. Emily Borda, along with Ed Geary (SMATE), Joann Otto (Biology), and Jeff Wright (Biology), were awarded \$2,000,000 from the National Science Foundation to implement a program entitled: "Change at the Core: A Collaborative Model for Undergraduate STEM Education Reform." This project was awarded through NSF's Widening Implementation and Demonstration of Evidence-based Reforms (WIDER) program whose overall goal is to widen the implementation of evidence-based best practices for undergraduate Science, Technology, Engineering, and Math (STEM) education. This project involves all CST departments and Huxley at WWU, as well as the STEM departments at Whatcom Community College and Skagit Valley College. Through this project, a number of faculty development activities will be carried out to catalyze the transformation of introductory-level STEM courses to include more active, student-centered teaching methods. These include quarterly workshops and a summer institute followed up by professional learning community work during the academic year. Almost 40 faculty members from chemistry, biology, geology, and environmental science are currently part of the first faculty cohort. They have participated in the first two workshops, implemented during winter and spring quarters 2014, and will do more in-depth learning and planning during the first summer institute in August.



External Grant Funding (cont.)

Amanda Murphy

Prof. Amanda Murphy received a Cottrell College Science Award (\$47,736 over 2 years) from the Research Corporation for Science Advancement. These funds will be used to create a versatile family of conductive biomaterials that can serve as 3D scaffolds to facilitate the formation of engineered neural tissues *in vitro*, or guide regeneration of transected nerves *in vivo*. Her group will undertake two complimentary routes to produce materials with these properties, which both draw common inspiration from the natural silk protein. First, a 'top-down' approach will be taken to synthesize porous 3D composites containing conducting polymers (for electrical interfacing) and silk sponges or hydrogels (for mechanical flexibility and slow biodegradation), using a chemical modification strategy they have recently developed. Secondly, they will use a 'bottom-up' approach to synthesize conducting polymers functionalized with peptides inspired by the GAGAGS repeats in the silk protein, which are capable of self-assembling into conductive 3D matrices. Both projects will produce materials with unique chemical and physical properties, in which the conductivity, 3D architecture, and mechanical strength can be tailored for applications involving neural stimulation and repair.

Amanda Murphy and Janelle Leger

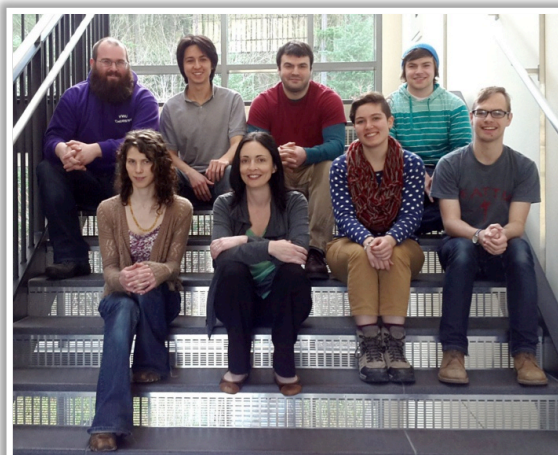
Prof. Amanda Murphy and Prof. Janelle Leger received a grant from the National Science Foundation (\$420,000 for 3 years) for their collaborative work to develop electromechanical actuators for use in biomedical applications. Biologically compatible materials capable of controlled movements, known as actuators, are highly sought after for use in a variety of biomedical devices such as dynamic artificial tissues, drug delivery depots, and steerable surgical instruments. Recently, the Murphy and Leger groups developed a method to construct fully-biocompatible, metal-free actuator devices utilizing a composite material made from silkworm silk and conducting polymers, and demonstrated that these materials can move in response to low applied voltages while in environments that mimic the human body. This funding will support further exploration of the effects of chemical composition, silk scaffold architecture, and actuator device geometry on 2D and 3D actuation in biological environments. More broadly, these studies aim to uncover rational design metrics that will be applied to the design of future generations of biomedical devices utilizing conducting polymer-based actuators. Furthermore, this program will provide the opportunity for 12-15 undergraduate students to participate in research, will serve to increase the infrastructure for undergraduate STEM research, and further foster collaborations between the Departments of Physics, Chemistry, and the Advanced Materials Science and Engineering Center (AMSEC) at WWU.

Murphy Research Group



(Left-to-right): Amanda Murphy, Paige Atterberry, Nicolas Ostrovsky-Snyder, Sean Severt, Ben Rubin, Brandon Ulrich, Taylor Blatz, Jesse Larson, Drew Goodman, Brad Farrell, Tyler Albin

Leger Research Group



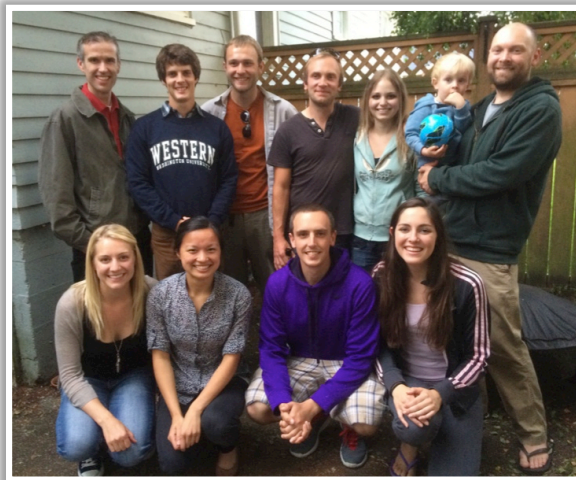
Back (Left-to-right): Nathan Bradshaw, Tyko Shoji, Kyle Hoke, Logan Morrison
Front (Left-to-right): Carly Klemke, Janelle Leger, Layla Masri, Kodiak Murphy



External Grant Funding (cont.)

P. Clint Spiegel

Prof. Clint Spiegel received an Academic Research Enhancement Award from the National Institutes of Health (NIH) (\$284,083 for 3 years) for his work entitled "Structural Requirements for Ribosome-Dependent GTPase Activation and Hybrid State Formation." Protein synthesis is a fundamental process that is essential to all living cells and is exclusively performed by large molecular machines called ribosomes. Roughly 50% of antibiotics that are in clinical use target ribosomes, making them the most common drug target to date. Major public health concerns have arisen, however, through prolonged use of antibiotic compounds, which has caused a rapid spread of antibiotic resistance in pathogenic bacteria. Moreover, many compounds presently used also carry high toxicities. Therefore, understanding the function of ribosomes at the molecular level would provide critical insight into the mechanism of action for many of these existing compounds. The aim of this work by the Spiegel lab is to structurally describe the molecular processes that govern ribosome function, which will lead to newer, more effective strategies for the development of antibiotic molecules.



Back (left-to-right): Steven Mullen, Joseph Gish, Wes Christianson, Justin Walter, Michelle Wuerth, Clint Spiegel (and son Emerson)
Front (left-to-right): Amanda Weis, Anne d'Aquino, Markus Carlson, Kira Podolsky

Spiegel was also awarded a WWU Student Technology Fee grant (\$44,000) to purchase biolayer interferometry instrumentation for use in Biochemistry courses and research. Molecular recognition in Biochemistry involves the specific binding and release of two (or more) biological molecules. These types of dynamic binding events are essential for all biological processes. In order to understand the nature of interactions between two molecules, one must be able to study the on- and off-rates of binding (which are kinetic measurements) as well as determine the equilibrium binding constants (which are thermodynamic values describing the "tightness" or "affinity" of binding). Although there are several techniques at the chemist's disposal to determine such information, most of these methods require either prohibitively expensive instrumentation or indirect measurements that are of little pedagogical value. The acquisition of new biolayer interferometry instrumentation allows for the collection of both kinetic and thermodynamic binding data in such a way that illustrates these biological processes effectively to students. These new biosensors not only allow our faculty to provide new, exciting experiments for our students immediately, but they also provide a means for future curricular development by increasing our experimental capabilities dramatically.

David Rider

Prof. David Rider was awarded an Undergraduate Research grant from the American Chemical Society Petroleum Research Fund (\$70,000, 3 years). The role of alternative fuels in a future global energy market remains intimately linked to today's fossil fuels. To address cost and performance setbacks in the pursuit of a widespread installation of fuel cell technology, the US Department of Energy has broadcast a need for nanoscaled catalysts with reduced precious metal loading. The objective of Dr. Rider's research is to deepen the understanding of the block copolymer template-directed synthesis of mono- and bimetallic nanoparticle (NP) catalysts that are designed to advance fuel cell catalysis. The proposed work will explore the underlying principles for prescribing the size, spacing, and composition of NPs that are isolated from self-assembled block copolymers loaded with metallic ions. This pursuit will define a structure-activity relationship between nanocatalysts and their self-assembled block copolymer templates. The template approach is flexible and allows for the preparation and screening of a variety of NP catalysts. Consequently, the Rider Group expects to access new bimetallic NPs that have a balanced composition in earth abundant and critical elements.



External Grant Funding (cont.)

David Rider (cont.)

Prof. Rider in collaboration with the WWU Engineering Department received renewed funding from Zodiac Cabins and Structures (ZCS) for summer 2014 (\$143,774). ZCS stowage bins are constructed from sandwich panels that include two phenolic/fiberglass composite skins on either side of an aramid honeycomb core. The process of “crush core compression molding” is used to create cured parts from semi-cured phenol-formaldehyde (PF) or phenolic polymer (b-stage) in the composite skins or prepreg. In 2008, the European Commission published a Restriction of Hazardous Substances Directive that highlighted that phenol-based polymers should be avoided in the next generation of composites. A partnership between ZCS and the Departments of Engineering and Chemistry at Western Washington University has been charged to investigate alternative polymers and processing for creating next generation composites for the aerospace industry in Washington.



Back (Left-to-right): Kalin Karich, Andrew Hollcraft, Satu Heiskanen, Diane Perez
Front (Left-to-right): Ryan Hackler, Sean Cavangh, David Rider, Audrey Taylor, Natasha Siepser

ZCS has also commissioned a second team of WWU faculty and undergraduates to investigate the fabrication of lightweight fasteners (bolt-type, clip-type, etc.) from the injection molding of thermoplastic engineering polymers. For injection-molded fasteners to compete with traditional options (steel, aluminum, etc.), the mold and mold conditions for fabrication need to be well understood and carefully tuned. In order to evaluate candidate materials and fasteners, characterization of the processing variables and the resulting fasteners is needed. Accordingly, the team at WWU is working to develop a sensibly designed mold for fabrication with well understood operating conditions (internal temperature and pressure), and a testing device capable of simulating and testing the mechanical stress that the experimental fasteners would experience.

WWU Chemistry Department Newsletter #15 was produced by:

Amanda Murphy (chair): writing, editing, layout, photography

Sal Russo: writing, editing

John Antos: layout

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C	He	Al	I	S	Tr	Y
Carbon	Helium	Aluminum	Iodine	Sulfur	Tritium*	Yttrium



Chemistry Faculty Publications in 2013-2014

In the past academic year the chemistry faculty have published 14 articles/chapters detailing their research, which include 33 undergraduate and 9 master's chemistry student co-authors.

Note: *WWU undergraduate student co-author, †WWU MS student co-author, ‡WWU REU student

Borda, E.J.; *Anzalone, K.; *Lockett, M.; *Wuotila, S. "Constructivism in Context: Factors Affecting Student Learning in Four Different Classrooms, in Research Based Undergraduate Science Teaching." Editors: D. Sunal, *et al.* Information Age Publishing: Charlotte, NC, 2014.

*Bowker, R.H.; †Carrillo, B.A.; *Ilic, B.; Reynolds, M.A.; Murray, B.D.; **Bussell, M.E.** "Carbazole Hydrodenitrogenation over Nickel Phosphide and Ni-rich Bimetallic Phosphide Catalysts," *Applied Catalysis A* **2014**, 482, 221-230.

†Erickson, C. S.; Bradshaw, L. R.; McDowall, S. M.; **Gilbertson, J. D.**; Gamelin, D. R.; **Patrick, D. L.** "Zero-Reabsorption Doped-Nanocrystal Luminescent Solar Concentrators", *ACS Nano* **2014**, 8, 3461-3467.

†Benjamin, W. E.; *Veit, D. R.; *Perkins, M. J.; *Bain, E.; *Scharnhorst, K.; McDowall, S.; **Patrick, D. L.**; **Gilbertson, J. D.** "Structurally Engineered Perylene Dyes for High Efficiency Luminescent Solar Concentrators", *Chem. Mater.* **2014**, 26, 1291-1293.

*Shoji, T.; *Zhu, Z.; *Ilkevich, A.; **Leger, J. M.** "Ion Profiles in Dynamic and Fixed-Junction Light-Emitting Electrochemical Cells by Secondary Ion Mass Spectrometry," *ACS Appl. Mater. Interfaces* **2013**, 5, 11509-11514.

*Toshner, S. B.; **Leger, J. M.** "Ionic Carriers in Polymer Light Emitting and Photovoltaic Devices," (Invited Chapter), *Organic Electronics: Emerging Concepts and Technologies*, Editors: Fabio Cicoira and Clara Santato, Wiley VCH 2013.

†Romero, I.S.; **Bradshaw, N.P.; *Larson, J.D.; *Severt, S.Y.; †Roberts, S.J.; *Schiller, M.L.; **Leger, J.M.**; **Murphy, A.R.** "Biocompatible Electromechanical Actuators Composed of Silk-Conducting Polymer Composites," *Adv. Funct. Mater.* **2014**, 24, 1-8.

*Albin, Tyler J.; **Fry, Melany M.; **Murphy, Amanda R.** Synthesis, Characterization and Secondary Structure Determination of a Silk-Inspired Self-Assembling Peptide: A Laboratory Exercise for Organic and Biochemistry Courses. *J. Chem. Educ.* **2014**, online August 2014.

O'Neil, G. W.; Knothe, G.; *Williams, J. R.; *Burlow, N. P.; *Culler, A. R.; *Corliss, J. M.; Carmichael, C. A.; Reddy, C. M. "Synthesis and Analysis of an Alkenone-Free Biodiesel from *Isochrysis sp.*" *Energy Fuels* **2014**, 28, 2677-2683.

Karich, Kalin E.; Fogel, April; *Hjorten, Curtis E.; *Katz, Noah M.; Hoekstra, Nicole L.; **Rider, David A.**; Larson, Nicole S. "The Effects of Processing Parameters on Warp in Composite Sandwich Structures." SAMPE Tech 2014 Conference Proceeding, **2014**, ID 4145.

Karich, Kalin E.; Fogel, April; *Hollcraft, Andrew T.; *Mumford, Thomas K.; *Fredrick, Craig K.; *Katz, Noah M.; Hoekstra, Nicole L.; **Rider, David A.**; Larson, Nicole S. "Investigation of the Stability of Phenolic Prepreg Manufacturing Using Thermal Analysis Techniques." SAMPE Tech 2014 Conference Proceeding, **2014**.

†Fedechkin, S.O.; †Brockerman, J.; †Pfaff, D.A.; *Burns, L.; *Webb, T.; *Nelson, A.; Zhang, F.; Sabantsev, A.V.; Melnikov, A.S.; McKnight, C.J.; **Smirnov, S.L.** "Gelsolin-like activation of villin: calcium sensitivity of the long helix in domain 6." *Biochemistry* **2013**, 52 (45), 7890-7900.

Sevy, A.M.; Healey J.F.; Deng, W.; **Spiegel, P.C.**; Meeks, S.L.; Li, R. "Epitope mapping of inhibitory antibodies targeting the C2 domain of coagulation factor VIII by hydrogen-deuterium exchange mass spectrometry." *J. Thromb. Haemost.* **2013**, 11 (12), 2128-2136.

†Walter, J.D.; †Werther, R.A.; *Brison, C.M.; *Craggerud, R.K.; Healey, J.F.; Meeks, S.L.; Lollar, P.; **Spiegel, P.C.** "Structure of the factor VIII C2 domain in a ternary complex with 2 inhibitor antibodies reveals classical and nonclassical epitopes." *Blood* **2013**, 122(26), 4270-4278.



2013-2014 Scholarship Recipients

WWU Chemistry Scholarship

Jordan Dotson
Cadence Luchsinger

Hach Scholarship

Matt Dean

Verna Alexander Price Chemistry Scholarship

Diane Perez

Jerry Price - Nancy Sherer Scholarship

Madeline Jalbert

Ruth Watts Female Scientist Scholarship

Jillian Adams

Barbara French Duzan Scholarships

Catherine Shelton
Pui Man Cheung
Orion Banks
Taylor Blatz

Oscar Edwin Olson Scholarship

Emily Sanders

Knapman Chemistry Scholarships

Benjamin Morgan
Han Cao

Denice (Ambrose) Hougen Undergraduate Fellowship

Nathan Bradshaw

Woodring Scholarship

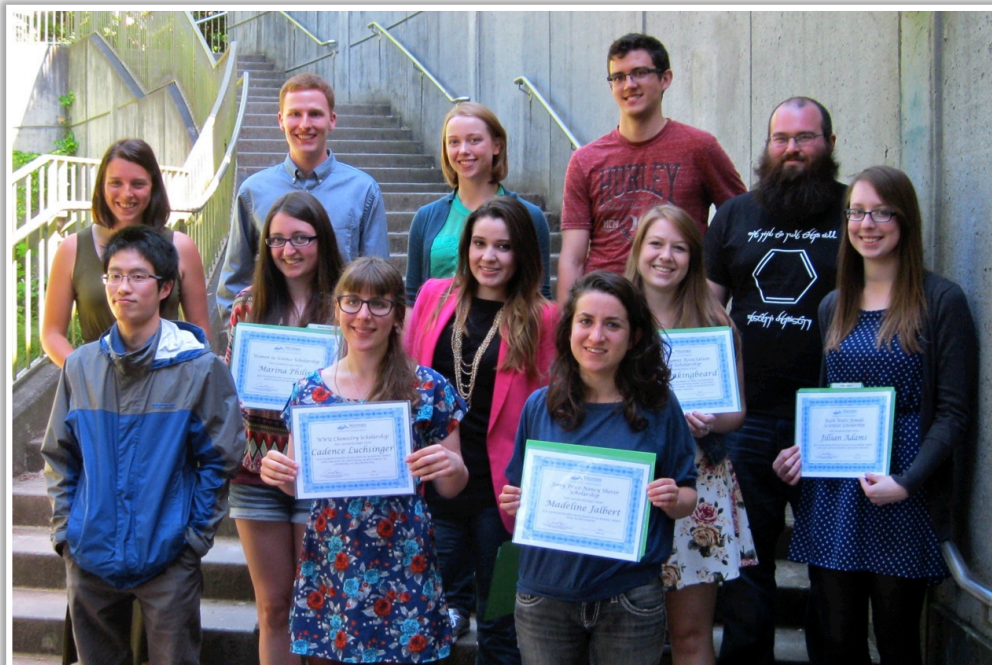
Soniya Pimparkar

Women in Science Scholarship

Marina Philip

Alumni Association Leader Scholarship

Tess Clinkingbeard



Front Row (left-to-right): Han Cao, Cadence Luchsinger, Madeline Jalbert
Middle Row (left-to-right): Catherine Shelton, Marina Philip, Diane Perez, Tess Clinkingbeard, Jillian Adams
Back Row (left-to-right): Benjamin Morgan, Taylor Blatz, Jordan Dotson, Nathan Bradshaw

2013-2014 Chemistry Awards

CRC Press Chemistry Achievement Award

Thomas Morrissey

Outstanding Organic Student Award

Jesse Prelesnik

Outstanding Organic Research Student

Steven Swick

Outstanding Analytical Student Award

Kiley Brown

Outstanding Inorganic Student Award

Shaun Gundert

Hypercube Scholar Award

Ryan Hackler

Sea Bong Chang Memorial Biochemistry Award

R. David Row

Advancing Chemistry Through Service (ACTS) Award

Nathan Bradshaw

Andrea d'Aquino

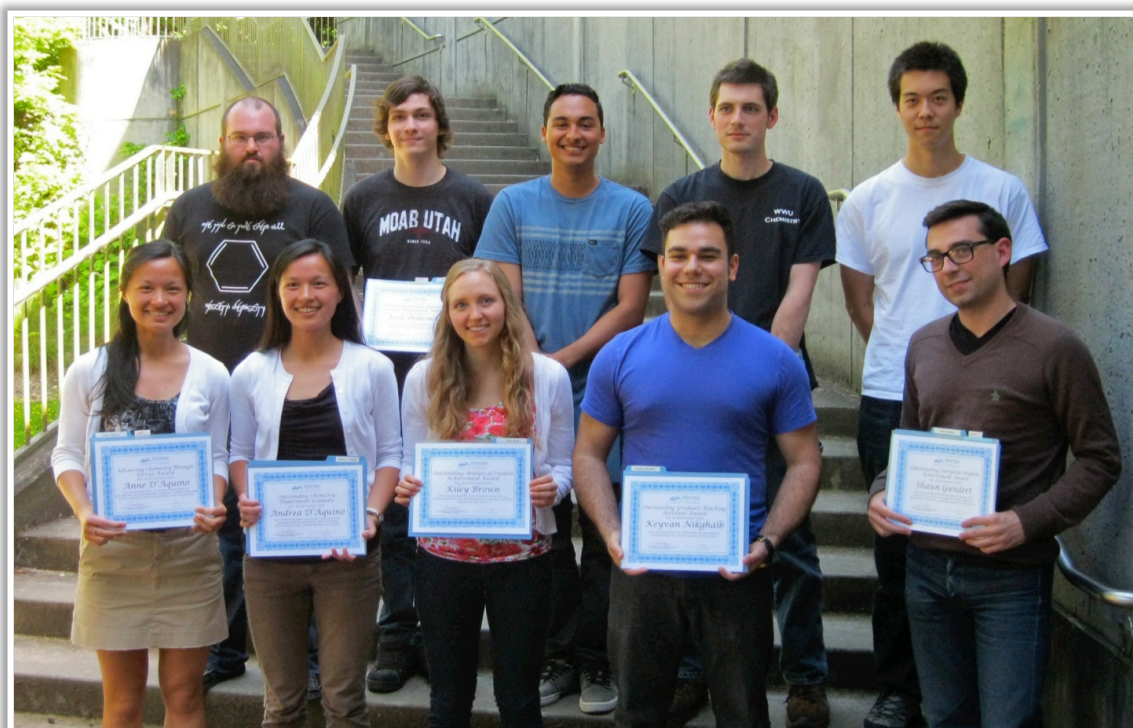
Anne d'Aquino

Outstanding Graduate Teaching Assistant

Keyvan Nikghalb

**Outstanding Department Graduate of 2014 and
CST Presidential Scholar Award**

Andrea d'Aquino



Back row (left-to-right): Nathan Bradshaw, Jesse Prelesnik, Ryan Hackler, R. David Row, Steven Swick
Front row (left-to-right): Anne d'Aquino, Andrea d'Aquino, Kiley Brown, Kevan Nikghalb, Shaun Gundert



Outstanding Graduate of 2014 and CST Presidential Scholar Award

Andrea d'Aquino

Andrea d'Aquino received the 2014 Presidential Scholar Award representing the College of Sciences and Technology and was also honored as the Outstanding Chemistry Graduate for 2013-14. Selection for the Presidential Scholar Award is based on exceptional scholarship and service to the university and community. Andrea was an excellent student who received a BS chemistry degree with honors. Her academic achievements at WWU were recognized by a number of scholarships, including the Kaiser-Borsari Scholarship for Women in Materials Science. Andrea also excelled as a researcher in materials chemistry, and carried out research with Prof. Mark Bussell for two years with a focus on developing a low temperature synthesis method for preparing highly-dispersed metal phosphide catalysts for removing impurities from transportation fuels. She received awards at the 2013 Pacific Northwest AVS Science & Technology Symposium and the 2014 Spring National Meeting of the American Chemical Society for posters she presented on her research project. In addition to her academic studies, Andrea had an extensive record of multicultural activities and community outreach, including serving as president of the WWU Chapter of the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) and participation in the Compass 2 Campus program to give fifth grade students an opportunity to learn about and participate in hands-on activities in alternative energy. In recognition of her intellectual and broader impact activities, Andrea was selected to receive a prestigious National Science Foundation Graduate Research Fellowship, which has only a 17% success rate for applicants. Andrea will enter the doctoral program in chemistry at Northwestern University in Evanston, IL in fall 2014 with a focus on materials chemistry.



Andrea d'Aquino with WWU President Bruce Shepard



Find us on Facebook!
www.facebook.com/wwuchem



2013-2014 Chemistry Graduates

Congratulations to
all **71** of our
graduates in Fall/
Winter 2013 and
Spring 2014!

MS Chemistry

Jamie Apperson
Bo Carrillo
Christian Erickson
Stanislav Fedetchkine
James Hall
Brienne King
Kyle Mikkelsen
Michael Murphy
Patrick Shelton
Elizabeth Wellner

BS Biochemistry

Tyler Albin	Hannah Judd
Ryan Bagnell	Bianca Long
Sean Bonato	Briana Mahoney
Weston Christensen	Sean Mathew
Alexander Cutler	Joseph McCollum
Anne D'Aquino	Teresa McDonald
Austin Farley	Andrea Musa
Spencer Fisco	Conor Myhre
Zachary Fitzgerald	Kira Podolsky
Joseph Gish	Stephanie Quinn
David Gruber	R. David Row
Benjamin Harris	Benjamin Rubin
Joanna Hoppins	Sara Schaefer
Stefan Irby	Gabriella Vargas

BS Chemistry

Mitchell Abston	Anton Ilkevich
Elle Britton	Tyler Kirkness
Nicole Brown	Yubin Kwon
Noah Burlow	Collette Machado
Tyler Cannon	Iris Phan
Paul Cochran	Caroline Schwery
Andrea D'Aquino	Sean Severt
Jordan Erickson	Ryan Sumner
Katie Frase	Steven Swick
Daniel Goertz	Nicolas Tobon
Drew Goodman	James Valadez
Ryan Hackler	John Williams
Boris Ilic	Alicia Wright

BA Chemistry

Jamie Bryce	Zachary Lucke	Adrian Richards	Hao Trinh
Michael Hill	Marshall Medley	Harkirat Sran	



ACS Puget Sound Section Undergraduate Symposium at WWU

On May 3rd, our department hosted the annual American Chemical Society Puget Sound Section Undergraduate Research Symposium at WWU. This year we were fortunate to have a record number of attendees – 168 students and faculty – come to the symposium! These students and faculty came from 9 universities including University of Washington, Pacific Lutheran University, University of Puget Sound, Evergreen State College, Central Washington University, Centralia College, Seattle University, and Peninsula College. During the symposium, 10 students gave oral presentations on a variety of topics ranging from asymmetric synthesis to analysis of sewage to determine drug use levels on college campuses. Both a morning and afternoon poster session was needed to accommodate all 53 posters (most with multiple authors) that were presented. We were also honored to have the 2014 Chair of the ACS Puget Sound Section, Despina Strong, attend the symposium. She was impressed with all of the exciting work being carried out by undergraduates in the Northwest.

While the voting may have been swayed a bit for the 'home team', the 'Student Choice' award for best oral presentation went to Tyler Albin from the Murphy research group, and Radhika Raj from the Gilbertson group earned the best poster presentation award.



Group Photo of Symposium Attendees



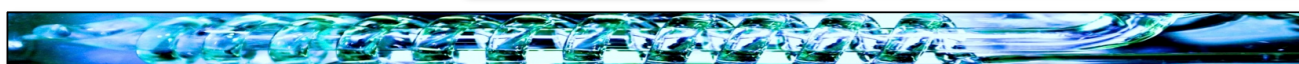
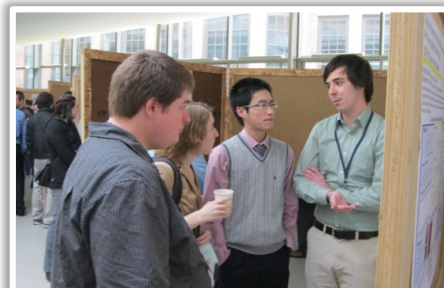
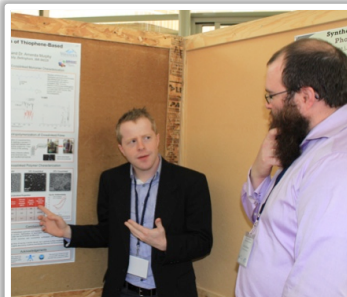
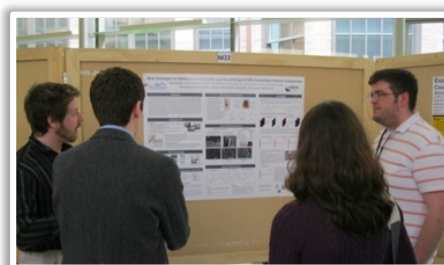
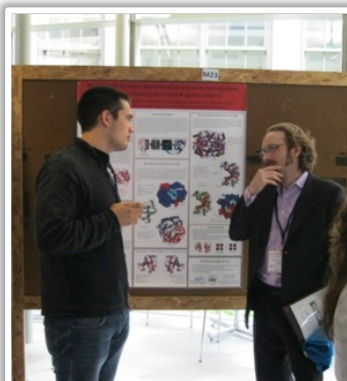
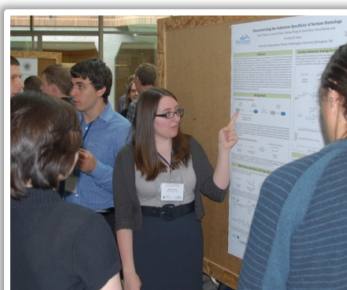
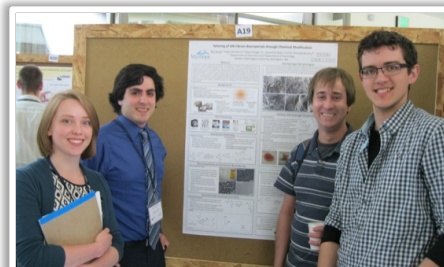
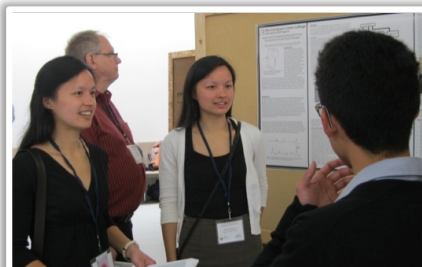
Tyler Albin : Best Oral Presentation



Radhika Raj : Best Poster Presentation



ACS Undergraduate Symposium Poster Session Photos



Scholars Week 2014

The Chemistry Department was very active during WWU's 2014 Scholars Week. This event, which was held from May 12-16, provided students with the opportunity to share their research in a campus-wide poster session and to attend a banquet with their advisors to celebrate their achievements. Chemistry students had a large presence at the campus-wide poster session. This year, 54 out of 153 posters presented were authored by chemistry students. Several students from chemistry also received *Best Poster* awards from Sigma Xi. As a testament to the strength of our research program, 9 out of the 17 university-wide *Best Poster* awards (7 undergrad, 2 grad) were given to chemistry students.

The Chemistry Department also organized its own Scholars Day activities, which included presentations from WWU chemistry students, as well as a visit from a prominent scientist. This year the department was pleased to host Professor Timothy M. Swager, who is the John D. MacArthur Professor of Chemistry at the Massachusetts Institute of Technology. Prof. Swager's research interests include numerous facets of polymer and materials science including the design, synthesis, and study of organic-based electronic, sensory, high-strength and liquid crystalline materials. Prof. Swager spent two days interacting with students and faculty. His visit culminated in a symposium on May 16th, in which WWU chemistry students Tyler Albin, Andrea d'Aquino, R. David Row, and Sara Schaefer all gave oral presentations as part of completing their Honors Theses, followed by a keynote address by Prof. Swager. These activities were made possible by the Pavia-Lampman-Kriz Chemistry Endowment and The Western Foundation Chemistry Fund.

Graduate Poster Awards:

Keyvan Nikghalb (PI: John Antos) "Constructing Isopeptide Bonds using Streptococcal Sortase Homologs"

Samuel Danforth (PI: Mark Bussell) "Synthesis and Characterization of Silica- Supported $\text{Co}_x\text{Ni}_2\text{-xP}$ Catalysts for Hydrodesulfurization"

Undergraduate Poster Awards:

Paige Atterberry (PI: Amanda Murphy) "Directing Nerve Growth on Silk-Based Biomaterials Containing Chemokines"

Nathan Bradshaw (PIs: Janelle Leger & Amanda Murphy) "Biocompatible Silk Poly(pyrrole) Composite Electromechanical Actuators"

Anne d'Aquino (PI: Clint Spiegel) "Structural Studies of Bioengineered Coagulation Factor VIII"

Daniel O. Goertz (PI: Tommaso Vannelli) "Complete Synthesis and Photophysical Characterization of a Photosensitizer Chlorin Scaffold with Bioconjugation Functionality for Applications in Photodynamic Therapy"

Ryan Hackler (PIs: Robert Berger & David Rider) "Theoretical Investigations on Bimetallic Nanoparticle Activity for Methanol Oxidation"

Sara Schaefer (PI: Greg O'Neil) "Development of a ring-closing metathesis (RCM) based synthesis of the archazolid natural products"

Johann Sigurjonsson (PI: Spencer Anthony-Cahill) "Structural and functional characterization of circularly-permuted hemoglobins"



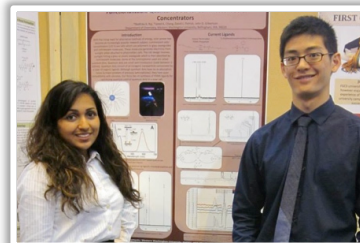
Scholars Week Photos



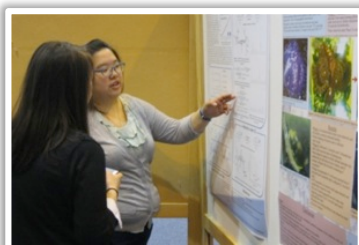
Tim Swager & Sean Cavangh



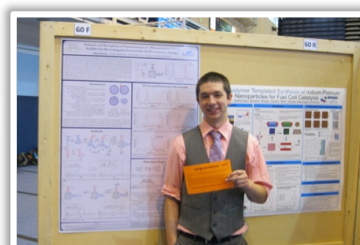
Poster Session



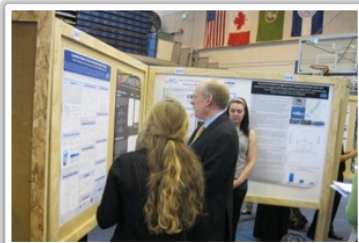
Radhika Raj & Jared Chang



Yubin Kwon



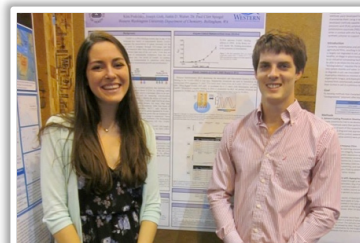
Daniel Goertz



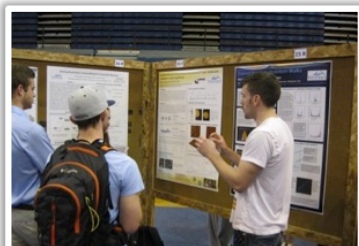
Sara Schaefer & Tim Swager



Chemistry Students at the Banquet



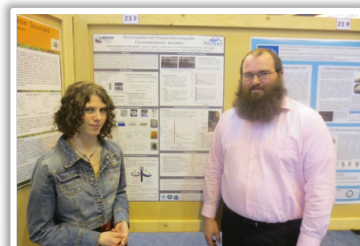
Kira Podolsky & Joseph Gish



Ryan Sumner



Jim Vyvyan, Gary Lampman, Don Pavia, Bob Matson



Carly Klemke & Nathan Bradshaw



John Williams & Noah Burlow



Organizational Mastermind Steven Emory



Diane Perez & Polly Wiltz



The Chem Club Continues to Grow!

Once again, Western Washington University's Student Chapter of the American Chemical Society (a.k.a. Chem Club) received an Outstanding Chapter Award from the ACS for the 2012-13 academic year. This marks the third year in a row the chapter has received this prestigious award. Of the more than 1,000 student chapters of the ACS, fewer than 50 were recognized with Outstanding Chapter Awards. This is the 11th straight year the Chem Club has been recognized for its efforts with an award from the ACS. In addition to the Outstanding Chapter Award, the club also received an ACS Green Chemistry Award from the ACS. These awards would not be possible without the support of students, staff, and alumni.

Prof. Steven Emory and Prof. Betsy Raymond serve as faculty co-advisers for the Chem Club. They said that the award is based on criteria such as community service, professional development events, research, and involvement with ACS regional and national meetings. Members assisted with the set-up, check-in, and clean-up of the Puget Sound ACS Undergraduate Research Symposium hosted by WWU this past May. The Chem Club regularly performs demonstrations and hands-on activities at several local schools (e.g. Happy Valley Elementary, Winward High School, and Sunnyland Elementary). Over the past few years, the club has also developed several professional development activities including "The Who, What, When, Where, Why, and How of Graduate School" and "How to Start the Professional Job Search." These activities benefit both the broader community and the chapter members.

"The chapter has really developed a strong outreach program. Because we have become so efficient, we are able to reach out to more schools. This November, we are going to perform our first science demo in Skagit County on the campus of Skagit Valley College. To make it even more interesting, the presentation will be bilingual (English and Spanish)! Prof. David Rider and students Diana Perez (chemistry major) and Polly Wiltz (biochemistry major) will lead the program. I am really excited to see how this turns out and what other opportunities it will present for outreach into the community," Prof. Emory said. "Students are our best ambassadors. They can connect with people in the community and affect lives. I am really happy that the ACS continues to recognize our students' efforts."

The award also recognizes the social and professional development activities the Chem Club has sponsored. The social activities are always a highlight of the year including: the chemistry costume bowl-off, chemistry trivia challenge, periodic table of cupcakes, and the annual picnic. In addition, this year the chapter focused on professional development opportunities for the students by organizing a networking workshop, in addition to its regular activities.



Hannah Fenske painted a new mural for the Chemistry library



Chem Club hosts 'chemistry trivia night'



Chem Club visits Maple Valley Elementary



Wizards of Western



The Chem Club Continues to Grow! (cont.)

A major goal for the upcoming year is to connect better with our incoming transfer students. "Students that transfer to Western only have a few years to connect with the department, making it very important that we connect with them as early as possible. This year Nathan Bradshaw, with the help of Prof. John Antos, will be implementing a student-led mentoring program for transfer students. Current Chem Club members will serve as mentors for transfer students to help them adjust to life at Western and especially the Chemistry Department," said Prof. Raymond. "Creating a welcoming environment is essential for retaining students. We are really excited to see how this program works and affects our students."

Christopher Grote (chemistry major from Camas, WA) and Noah Burlow (biochemistry major from Centralia, WA) were co-presidents of the 2013-14 Chem Club. Chris is a senior at Western and will graduate in the spring. Noah is currently a first-year chemistry graduate student at the University of California at Davis.

The award-winning chapters were recognized in the November/December issue of inChemistry magazine <http://www.acs.org/inchemistry> and were formally acknowledged at the ACS Student Chapter Award Ceremony during the ACS National Meeting in Dallas this past spring.

For additional information and photos, please visit the WWU Department of Chemistry Facebook page at: <http://www.facebook.com/wwuchem>.

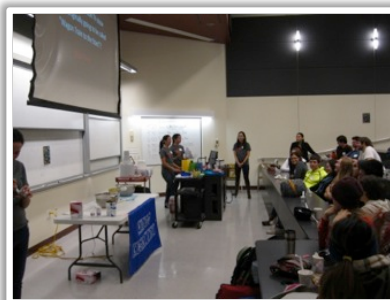
If you have any questions or suggestions, please feel free to contact Prof. Raymond (Elizabeth.Raymond@wwu.edu) or Prof. Emory (Steven.Emory@wwu.edu) who are the 2014-15 Chem Club faculty co-advisors.



Judging the science fair at Roosevelt Elementary School



Chemistry demo at Maple Valley Elementary School



'Diversifying STEM' mixer hosted by SACNAS



Noah Schurr at the ACS meeting in Dallas



Mount Vernon High School Science Night



Students prepare the 'periodic table of cupcakes'



Department Picnic Photos 2014

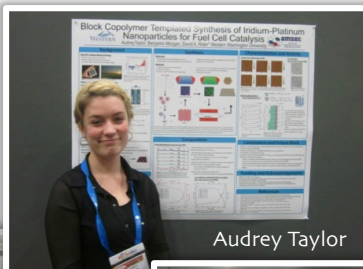


Student Attendance at National Conferences

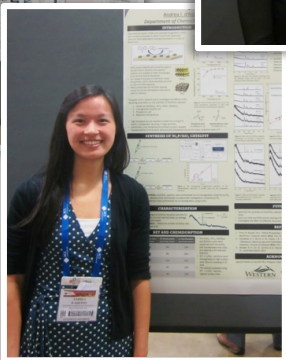
National ACS Meeting



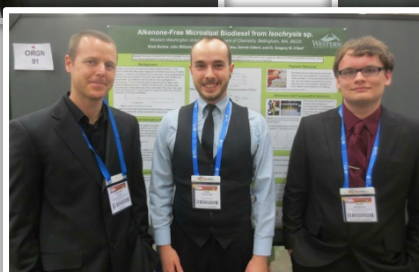
Nathan Bradshaw and
Sandra Roberts



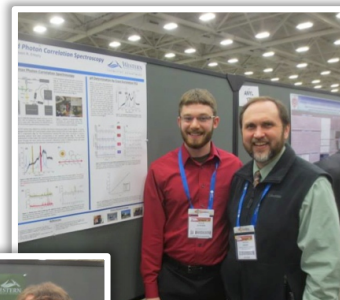
Audrey Taylor



Andrea d'Aquino



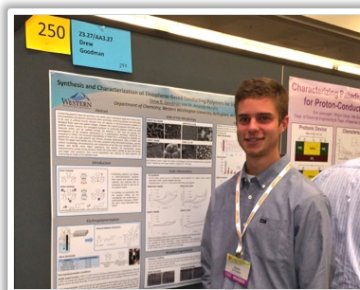
Greg O'Neil, John Williams, Noah Burlow



Noah Schurr and
Steven Emory

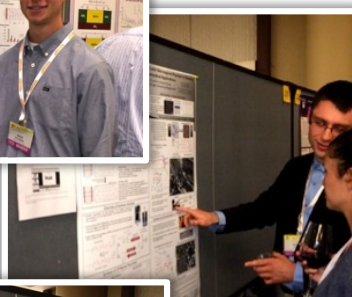
March 2014
Dallas, TX

Materials Research Society Meeting

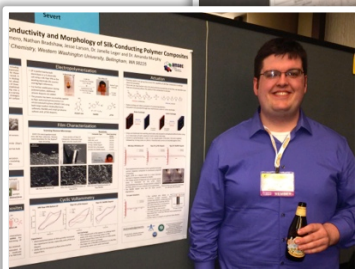


Drew Goodman

April 2014
San Francisco, CA



Tyler Albin



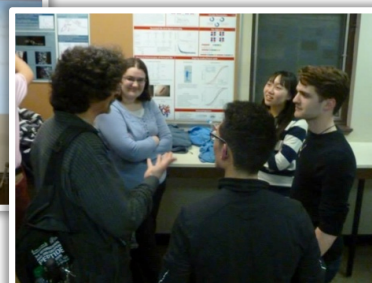
Sean Severt

Volcano Conference



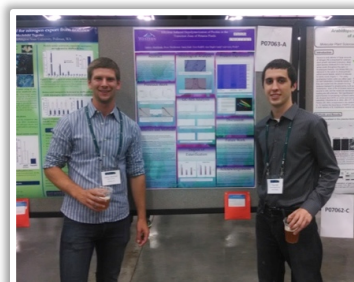
Johann Sigurjonsson

Pack Forest Conference
Center, WA



WWU students with keynote
speaker Bill Lubbell

American Association of Plant Biologists Annual Meeting



Andrew Muchlinski and Saum Hadi

