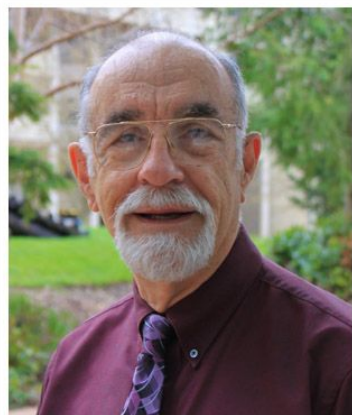


### Message from the Chair



**George Kriz**

On behalf of the Department of Chemistry, I bring you greetings. Our department chair, Steve Gammon, is currently on professional leave. It is my privilege to sit in his place and try to represent this amazing department.

As anyone who picks up a newspaper already knows, this is a difficult time for Western and for our department. Budgets are being slashed across the university, and this department has had to absorb its share of budget cuts. So far, we have been able to make adjustments that will allow us to keep going. Unfortunately, my crystal ball is too cloudy for me to be able to tell you what will be happening in the near future. Rest assured, however, that the department and its faculty are committed to one principal goal – to maintain the quality of the program that we have built over a period of many years. We will do what we can to provide our students with dedicated faculty and cutting-edge learning opportunities.

In spite of the gloomy outlook, it is important that we remember the bright spots. Elsewhere in this newsletter, you will read about our newest faculty member, David Rider. David comes to us after a two-year postdoctoral stint at the University of Alberta. He earned his PhD at the University of Toronto. The Bellingham area is familiar to him, since he did his undergraduate work just over the border at Simon Fraser University. David's appointment is associated with the AMSEC program, and he shares his teaching assignments between chemistry, engineering technology, and material science.

In past newsletters, you have read about progress on a new addition to the Chemistry Building. That project is now finished, and we have moved into very attractive new space. The new addition includes new research laboratories, a new teaching laboratory, office space, a lecture classroom, a new computer laboratory, and a spacious department office. There is also some laboratory and office space that has been assigned to the Department of Biology. Be sure to stop in and get a tour on your next visit to our campus!

Our faculty continue to earn plaudits and awards. We are proud of Janelle Leger, another of our AMSEC faculty whom we share with the Department of Physics and Astronomy. Janelle recently learned that she has been granted an NSF CAREER award. We are also proud of Greg O'Neil (also a new father!), who succeeded in winning a 2010 Jean Dreyfus Boissevin Lectureship grant. This grant supported a visit and lectures by a distinguished scientist (Christopher Reddy, Senior Scientist, Woods Hole Oceanographic Institute), as well as summer stipend support for research students. Western was one of only four institutions in the nation to receive a grant under this program. That we have a continuing series of faculty who are able to convince the granting foundations that they deserve these prestigious awards is compelling evidence that Western continues to attract amazing faculty and to offer high-quality programs. In spite of the gloom that accompanies the daily news of budget cuts and on-campus stress, we should remember that we have a community of very bright and capable people who will carry us through these crises, continue to win awards, and continue to inspire students with first-class programs. Programs that are recognized as outstanding attract superior students, open doors for students, and have unique opportunities for continued growth and improvement.

Even the departmental "old guy" (me) collected an award. I received the 2010 Distinguished Service Award from the Division of Chemical Education of the ACS. This award, in the form of a glass hand-blown apple (for the teacher), was presented at the Boston ACS meeting in August 2010.

We have a lot to be proud of, and, ultimately, we are most proud of our students who have passed through our classes and laboratories and have gone on to distinguish themselves in so many ways. It is always a thrill to have one of our alumni stop by for a visit and to hear what they have done with their lives and with the educational boost that we have strived to provide. Please keep us in your thoughts, visit us when you can, drop us a note to let us know how you are doing, and help us financially to the extent that you are able. One final request: at every opportunity, let people know what a special resource sits on the side of Sehome Hill and how the community and the state benefit from what we have to offer.

Best wishes to all of you!

George

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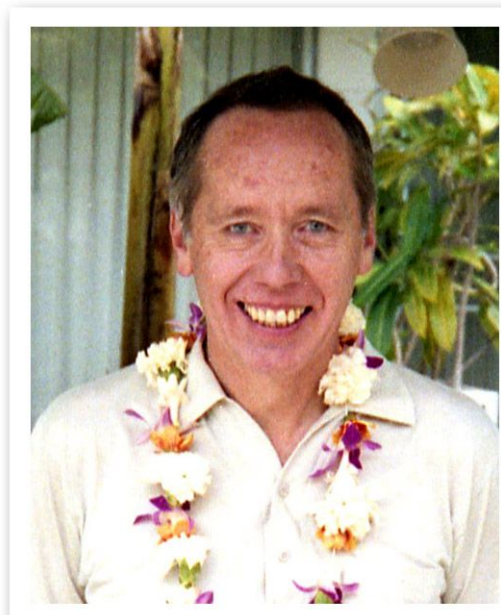
# In Memory of Joe Crook

Joseph R. Crook was born on October 16, 1936 in Reno, Nevada and spent his early years in Sparks, Nevada. Joe graduated from the University of Nevada-Reno in 1958 with a BS in chemistry. Joe and Rosalind were married that same year. Joe received his PhD from the Illinois Institute of Technology in 1964 where he investigated the hydrogen bonding properties of hydrazines for his thesis research. Following an NSF postdoctoral at the University of Colorado- Boulder, he joined the chemistry faculty at San Jose State in 1964. After two years there, he was lured to Cleveland State University where he was heavily involved in developing a PhD program in clinical chemistry and teaching physical inorganic chemistry.

In 1970, Joe was hired as the new chairman of the Chemistry Department at Western. During his chairmanship, the university went through a painful reduction-in-force. Joe did an excellent job in leading us through that difficult period.

While at Western, Joe taught general and inorganic chemistry. In addition, Joe, Jack Weyh, and Don King, along with programmer Kris Bruland, prepared computer-based instructional materials for use in general chemistry. One of those programs is entitled Inorganic Qualitative Analysis. It contains digitized video images of known and unknown samples used by students to learn the descriptive chemistry of selected inorganic ions or to solve randomly generated unknowns.

That same trio of faculty members also developed laboratory experiments for the LabWorks interface system. One of the big changes that occurred when the department moved to a new building in 1993 was to include a computer and interface system at each student station in all the general and analytical labs. Students use the interface to control experiments and collect data. A spreadsheet is used to treat the data.



Joe In Hawaii 1989



Joe and Rosalind enjoyed two sabbatical years (1986-87 and 1990-91) at the University of York in northern England, where Joe collaborated with Professor Roger Mawby on studies of the organometallic chemistry of ruthenium.

After retiring from Western in 1995, Joe returned to curriculum development as an author and editor for Chemical Education Resources, where his task was to write general chemistry experiments that use computers for data acquisition.

In 1970 when Joe arrived in Bellingham, we soon discovered that we enjoyed running together. Our friendship blossomed when we attended an ACS meeting in Honolulu in 1975. It was a magical first-time visit to Hawaii for both of us. On our first day there, we went to the top of the Ilikai Hotel for a view of the city. We were dazzled by a spectacular rainbow which we interpreted as a good omen. On another day, we walked to Diamond Head crater where we climbed to the top for an

## In Memory of Joe Crook (cont.)

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expansive ocean view. After the meeting, we took a tour of the Big Island where we viewed Halemaumau crater within Kilauea caldera, Thurston lava tube, black-sand beaches, and learned the difference between lava types. Our only disappointment was that we did not see flowing lava. We returned to Honolulu for Pacifichem conferences in 1985 and 1989 and repeated our conquest of Diamond Head each time.

Joe and I ran or walked together for 40 years. During our running days, we developed a game where we kept track of the money we found. It was a way of adding some interest to our exercise regime. At the end of the year, we would count our finds and have a dinner celebration with our wives.

I miss Joe's warm greeting and friendly smile. He was a dependable companion and a source of encouragement. We certainly had a lot of fun together. Joe had serious health problems during his last year of life, but despite those challenges, I found that it was a comfort for us to spend time together.

Joe passed away November 27, 2010 and is survived by Rosalind, his wife of 52 years; son Brian, daughter-in-law Jessie, granddaughters Bailey, Chelsea, and Hannah of Bellingham; daughter Brenda, son-in-law Peter Luciano, granddaughter Sierra, grandson Joey of Maynard, Massachusetts; daughter Laura and John Schneider of Acton, Massachusetts; daughter Linda and son-in-law Al Cornish of Pullman, Washington.

Sal Russo, colleague and friend

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## Joe Crook Scholarship

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The Department of Chemistry would like to set up an endowment in honor of Joseph Crook. Our goal is to have an undergraduate scholarship to be named the Joseph Crook Honorary Scholarship. The faculty, emeritus faculty, and staff in the Department of Chemistry have agreed to match any donations from alumni and friends up to \$650. Please help us honor Professor Crook and his contributions to the department and the university. Send pledges to the Chemistry Department ([chemdept@chem.wvu.edu](mailto:chemdept@chem.wvu.edu)) and we will send you a pledge reminder through the Western Foundation.



# Alumni Spotlight - Bob Matson



Bob Matson

Bob spent his youth on Fidalgo Island where he enjoyed the picturesque beaches and pristine waters of the San Juan Islands and their bounty of fresh seafood. Occasionally, he observed orca whales as they passed close to shore at Sunset Beach in Anacortes. While these idyllic times have long since passed, and the whales have moved further away, he returns for a visit with his family year after year.

Western Washington State College, 1965-1970

While in high school, Bob developed a keen interest in science, even constructing a rudimentary lab on the family farm. After graduating from Anacortes High in 1965, Bob followed in the footsteps of his Aunt Ada (Washington State Normal School, ca. 1928) and set off to Western Washington State College to become a science teacher. Bob was soon immersed in campus life. He became a member of the Student Activities Commission and a Viking mascot.

Bob elected to major in chemistry as a freshman, little knowing that he would roam old Haggard's narrow halls for the next 5 years. Andy Frank's freshman chemistry was especially challenging, but most students enjoyed his macabre sense of humor with drapings of black crape paper hung over

the door as they entered to learn of their fate on exams. However, Bob's greatest challenge as an undergraduate was analytical chemistry. He is particularly indebted to Don King who took great measure and patience in his tutoring. The department in the mid-60s was full of excitement with new faculty arriving: Don King, George Kriz, Bill Wilson, Sal Russo, and John Searle. This offered up a lot of new courses and fresh ideas. There was also an opportunity for Bob to get involved in undergraduate research. Fred Knapman, Gary Lapman, and George Kriz rounded out the organic chemistry faculty. Bob's first research project was with George who at the time was studying the thermodynamics of keto-enol tautomerization. It was Bob's first taste of research, and George provided an exciting and rewarding experience that has lasted a lifetime. Bob fondly recalls the first experiment that George and he performed together. When all was ready to initiate the reaction in the calorimeter, George jumped out of the lab and took shelter. George yelled back that he had never done this particular reaction before, but to carry on. It worked and all was well.

In the following year, Bob decided to try his hand at biochemistry with Sea Bong Chang. It was Sea Bong's mentoring that eventually led Bob into a career in biomedical research. The Chang laboratory was bustling with activity, and it offered Bob the chance to interact with graduate students. Sea Bong was dedicated to his students. They were enthusiastic and much more disciplined in their work. It was a great learning environment, providing Bob with the skills necessary to take on his own projects. He began work on the enzymology of galactolipid biosynthesis. He learned to culture *Euglena gracilis* and study photosynthetic effects. This led to his first peer-reviewed publication while still an undergraduate. With the arrival of biochemist Sal Russo and natural product chemist John Searle, the department was able to offer a good number of advanced courses in biochemistry. Bob took full advantage of the opportunity, petitioning the university to audit as an undergraduate. Later, Sea Bong Chang, Sal Russo, and John Searle served on his Master's thesis committee.

Concomitant with working toward his Master's in Chemistry, Bob spent his days teaching 7<sup>th</sup> and 8<sup>th</sup> grade math and science in Arlington, Washington. However, a growing passion for scientific research led Bob to consider further graduate work. So, at the recommendation of Western's faculty, Bob entered the Chemistry Department at Wayne State University in Detroit to begin his doctoral studies.

Wayne State University, 1970-1975

After successfully passing all of the qualifying exams, Bob was admitted into the doctoral program in biochemistry. Later, Bob was awarded the Knowler Fellowship in Chemistry, enabling him to complete his doctoral studies.

# Alumni Spotlight - Bob Matson (cont.)

Professor T.T. Tchen, known for his work on cholesterol metabolism with Nobelist Konrad Bloch, chaired the Biochemistry Department. T.T. was an inspiring, charismatic, and demanding mentor to his students. He skillfully engaged the students to learn first how to think like a scientist. At Tchen's suggestion, Bob joined up with analytical biochemist Tokuji Kimura for his doctoral work. Kimura's group was involved in the study of electron transport systems, especially those associated with cytochrome P450s. Because of Bob's interest in metabolic regulation, he chose to study the biogenesis of adrenodoxin. This iron-sulfur protein or ferredoxin is involved in electron transport to membrane-bound cytochrome P450. Unfortunately, this required mammalian cell culture and stable cell lines were unavailable at the time since growth factors had not been identified. As a result, Bob chose to pursue his studies of a closely related ferredoxin in *Euglena*, a eukaryote for which he had considerable experience cultivating while at Western! Under Tokuji's guidance, Bob purified a ferredoxin and developed an immunoassay for the protein. With the use of selected mutants and metabolic inhibitors the biogenesis of ferredoxin was determined and the findings published in 1976.

## University of California – Los Angeles, 1975-1978

Bob next moved to Los Angeles for postdoctoral work with lipid biochemist Armand Fulco at UCLA's Department of Biological Chemistry. Armand's group was studying fatty acid metabolism in *Bacillus* species and had recently discovered a fatty acid hydroxylase. Applying the skills learned while in the Kimura lab, Bob quickly identified it as a cytochrome P450 monooxygenase. Over the next few years the laboratory became fully engaged in protein purification and characterization of the enzyme. The direction of research ultimately changed toward molecular biology.

## The Veteran's Administration and UC Davis Medical School, 1978-1980

Following postdoctoral studies, Bob accepted a joint position as a principal investigator with the Veteran's Administration Medical Center (VAMC) and adjunct assistant professor in Biological Chemistry at the UC Davis Medical School where he taught biochemistry. Bob established a laboratory at the VAMC that included work with the Surgery Department on the biochemical mechanisms surrounding cholesterol gallstone formation. This work centered upon the role of microsomal lysophosphatidyl acyl transferase in the etiology of the disease. The research provided a successful master's thesis project for graduate student Allen Rutledge from California State University - Hayward. Bob also received a Young Investigator Award from the California Lung Association for work on cytochrome P450 metabolism in lung macrophage. This included participation as a member of Lester Packer's membrane bioenergetics group at UC Berkeley on fundamental studies of membrane damage due to lipid oxidation. It was during this period that Bob began research on the use of a new separation technology, high performance liquid chromatography (HPLC) for analytical biochemistry.

## University of Southern California, 1980-1982

Upon the closing of his laboratory at the VAMC, Bob accepted an interim lectureship at USC's Department of Chemistry where he taught freshman chemistry. Bob found it to be both a refreshing and rewarding experience working with the faculty, especially Ken Service and Howard Taylor. At the same time Bob rejoined Fulco's group at UCLA as a visiting scientist with the Laboratory of Biomedical and Environmental Sciences. There he began studies on the newly discovered barbiturate induction of the bacterial cytochrome P450 monooxygenase.

## University of Southern Maine, 1982-1984

Following his USC lectureship, Bob accepted an assistant professorship in USM's chemistry department. There he taught general chemistry, organic chemistry, and developed a full year lecture and laboratory course series in biochemistry. A research laboratory was constructed and work began in collaboration with Professor Fulco's group with efforts focused on further developing HPLC for P450 metabolite analysis. A collaboration with Steve Goheen, a former VAMC colleague who had recently moved to Bio-Rad Laboratories, was also initiated to evaluate new solid phases for HPLC.

## A Move to Industry

Bob's continued interest in separation science led him to accept a research position with Bio-Rad Laboratories in 1984. As a group leader, he helped develop new polymers and bioaffinity-based methods for protein and nucleic acid purification and characterization for the now rapidly growing HPLC market. Bob served on the editorial board of the *Journal of Preparative Chromatography* during this time. In 1988, Bob became Director of Research and Development at Nuclepore-Costar where they developed membrane separation products. At startup BioProbe International, he led the development of process-scale protein separation media.



# Alumni Spotlight - Bob Matson (cont.)

## Beckman Coulter

In 1991, Bob joined what would later become known as Beckman's Advanced Technology Center. During his 17-year tenure, Bob was instrumental in the development of the company's microarray technologies. Early work included collaboration with Sir Edwin Southern on the in situ synthesis of oligonucleotide arrays for mutation detection and gene expression, and the National Institute of Standards and Technology sponsored Genosensor Consortium, a 5-year program aimed at the commercialization of microarrays for clinical diagnostics. Bob explored new methods for surface modification of polymeric supports, micro patterning, image analysis, and low-level detection, as well as automated processing of microarrays. In May 1999, Bob was honored to speak at the 5<sup>th</sup> International Symposium on Mutations in the Human Genome held in Vicoforte, Italy that highlighted his work on the automation of DNA microarrays. Other activities included work with David Walt at Tufts University on DNA-based fiber optic arrays and with Chris Scholin at the Monterey Bay Aquarium Research Institute on a DNA probe array for the environmental sample processor used in the monitoring of toxic aquatic organisms. Bob also joined David Walt on the editorial board of *Applied Biochemistry and Biotechnology* and served as reviewer for the journal *Clinical Chemistry*. In later years, he turned his attention to research involving protein microarrays. This work resulted in the development of one of the first microplate-based multiplexed immunoassays later commercialized as the A<sup>2</sup> MicroArray System. Bob has lectured and published extensively in these areas, including the authoring of 2 books on microarrays. He is an inventor on 18 patents and was inducted into Beckman Coulter's Inventors Hall of Fame in 2005. Bob was elected a Fellow of the National Academy of Clinical Biochemists in 2007.

## QuantiScientifics

In 2009, Bob became an entrepreneur when he acquired the A<sup>2</sup> MicroArray business from Beckman Coulter and founded QuantiScientifics. Much to Bob's satisfaction the company is engaged in offering products and services based upon inventions and technologies he and his colleagues helped develop.

## Educational Outreach

Bob's original aspiration was to become a high school chemistry teacher, but as often happens he followed a different path. However, throughout his career he has been actively engaged in promoting science education, especially at the elementary and secondary school levels. He participated in the NSF Young Scholars Program at California State University - Fullerton and was named Outstanding Mentor for his work that provided high school science students with hands-on training for 1-2 years in his laboratory. Bob joined the UCI/NSF Science Technology and Society Project and served on the Science Education Advisory Board at the University of California - Irvine, whose aim was to mentor local high school science teachers in developing science curriculum. Through the generosity of Beckman Coulter, Inc. Bob was able to secure funding that provided needed scientific laboratory equipment. He was named "Principal for a Day" by the Huntington Beach School District. As a member of Project Tomorrow, he participated in science teacher education and chaired the selection committee in the awarding of technology grants to participating school districts. For his work, Bob was honored with a proclamation from the State of California. Currently, Bob is busy with student entrepreneurs at the Keck Graduate Institute of Applied Life Sciences in Claremont, Calif. and participates as an advisor to doctoral candidates.

## Family

Bob has been married for 41 years to Jeanne whom he first met at Western while an undergraduate. They have resided in Orange, Calif. for the past 22 years. Jeanne is an elementary school teacher who helps with marketing for QuantiScientifics in her spare time. In turn, Bob helps bring science into her classroom. The Matsons have two adult children. Erik is a composer and musician while Jacqueline recently retired from competitive ice-skating to coach young skaters in her sport. Aside from family and career, Bob has been an avid hiker and Boy Scout leader. His most memorable experience was a 10-day trek with his son's troop into the Sierra Mountains that culminated with a successful climb to the top of Mt. Whitney. Erik, an Eagle Scout, celebrated his 17<sup>th</sup> birthday on the summit and helped demonstrate a fundamental concept of science - the need for oxygen to ignite a candle.



# Spotlight on AMSEC

The Advanced Materials Science and Engineering Center (AMSEC) was founded in 2007 with a mission to educate students in materials science, support interdisciplinary research, and enhance regional industry competitiveness and innovation. Since 2007, the program has grown dramatically and now includes 24 faculty members, 13 of whom are from the chemistry department. Several notable accomplishments were made by AMSEC chemistry faculty and students in 2010-11 that will be highlighted here.

Dr. David Rider was hired as the second AMSEC faculty member in September 2010. In keeping with the interdisciplinary nature of Materials Science, Rider has a joint appointment in both the Chemistry (2/3) and Engineering Technology (1/3), and is anticipated to make valuable contributions to both departments. Rider is a native of Canada, and completed his PhD at the University of Toronto, and did his postdoctoral work at the University of Alberta and National Institute for Nanotechnology of Canada. Dr. Rider's research at WWU will involve the design, synthesis and self-assembly of organic and inorganic semiconductors for applications in nanotechnology and materials science.



AMSEC faculty receiving the Team Recognition Award in September 2010.

The AMSEC faculty members received the WWU Team Recognition Award at the Fall Convocation, awarded by President Bruce Shepard. This award aims to recognize "a group or team of staff and faculty who exemplify cooperation, collaboration and open communication." Much of the teamwork that led to this award was orchestrated by Prof. David Patrick, who has served as the AMSEC director since 2007. In the Fall of 2010, Patrick's term came to a close, and the role of director was passed to the capable hands of Kathleen Kitto from Engineering Technology.



First group of chemistry students graduating with a Materials Science minor in Spring 2010.

From left: Michael Murphy, Hannah Halliday, Samantha Sommer.

AMSEC faculty members were also very successful in receiving grant funding in 2010, allowing materials science research opportunities for students to expand dramatically. Janelle Leger and co-PI's Steve Emory and David Patrick received an MRI grant (~\$280k) from the NSF to purchase a new AFM and microscope. Janelle Leger, John Gilbertson, Steve McDowall, Brad Johnson, and David Patrick also received a SOLAR grant worth nearly \$1M from NSF for a project in solar materials. Janelle Leger also received an Early CAREER Grant from NSF, which is \$530k award to be spent over the next 5 years. More details about each of these grants can be found in the grant activity article in this newsletter. The ability for AMSEC faculty to attract this exceptional amount of funding is a testament to the high quality research that is being undertaken here at Western.

In addition to faculty achievements, several of our undergraduate chemistry majors are also working towards completing a Materials Science minor through this program. A total of 59 students have participated in the materials science minor since it began in Fall 2009. In spring of 2010, the first graduates of this program were two students majoring in chemistry and one in biochemistry. This spring, an additional five chemistry majors and one biochemistry major will complete the minor. The program continues to gain momentum, and currently 29 students (12 of whom are chemistry majors) are working to complete the minor. Finally, the 2010 Kaiser-Borsari Scholarship for Women in Materials Science was awarded to Isabella Romero, who is a chemistry major that will be graduating this spring.

# Grant Funding in 2010

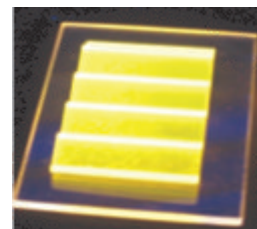
The time and hard work our chemistry faculty put into writing research grants was highly rewarded in 2010. Eight of our faculty members were awarded grants totaling over two million dollars, to be spent over the next several years. Grants were awarded from various agencies including National Institutes of Health (NIH), the National Science Foundation (NSF), Research Corporation, and the Camille & Henry Dreyfus Foundation. The funding will be used to fund student stipends, purchase new equipment, and pay for research supplies. Descriptions of the individual projects are given below. Congratulations to everyone!

## SOLAR NSF Award



A group of five Western faculty led by Chemistry professor David Patrick has received a \$970k, 3-year grant from the NSF to develop new technologies for making solar electricity. The grant is the first of its kind to a predominately undergraduate university through NSF's highly competitive SOLAR program, which awards only about 5% of proposals received. The team includes Profs. John Gilbertson and Janelle Leger, as well as Brad Johnson (Physics) and Stephen McDowall (Mathematics). The goal of the research is improve the efficiency of luminescent solar concentrators (LSCs), which will be used to collect sunlight for producing solar electricity. The design of the new LSCs is based on a new nanostructured

fluorescent plastic developed as part of the research which acts like a 'chemical lens', bending light in predetermined directions and guiding it to solar cells around the edges of the concentrator. By replacing a large area of expensive solar cells with an inexpensive plastic concentrator, these new LSCs may reduce the cost of solar electricity, perhaps even bringing it on par with traditional fossil fuel sources. Unlike lens- and mirror-based concentrators, the new LSC does not have to track the sun, so involves no moving parts, and works equally well under cloudy and clear conditions, making it especially well-suited for our NW climate, as well as large population centers of northern Europe and Asia.



## Janelle Leger Receives NSF Career Award

Assistant Professor Janelle Leger (joint faculty with Physics) received a prestigious NSF CAREER award (\$530,000 over five years) to study conjugated polymers that conduct both ionic and electronic currents in the solid state. The research aims to develop a fundamental understanding of ion movement and electrochemical processes in conjugated polymers. Important materials science issues such as stability, doping, and morphology of the organic semiconductor materials are investigated. The research goals of this project are to develop fundamental knowledge concerning ionic carriers in conjugated polymer mixed conductors, to guide materials and device design by enabling the development of predictive models, and to apply this knowledge to develop novel optoelectronic device structures such as white-light emitters and photovoltaic devices.





## Clint Spiegel Receives NIH Award



Assistant Professor Clint Spiegel recently received an award from the National Institutes of Health to study blood coagulation proteins associated with hemophilia. The protein he is focusing on is called "factor VIII". Genetic mutations that render factor VIII inactive cause hemophilia A, which is a bleeding disorder that affects 1 in 5,000 males worldwide. Upon treatment of hemophiliacs with therapeutic doses of factor VIII, inhibitor antibodies develop, which often worsens the patient's condition and makes therapy more difficult and expensive. The goal of the proposed research project is to provide a better understanding of how these antibodies become pathogenic and will lead to the development of better treatments for hemophilia A patients. Additionally, this project will attempt to engineer more stable and

active variants of factor VIII to improve upon the existing therapies. The grant is \$389,288 for three years. It will fund a full-time research technologist position, provide summer stipends for several undergraduates and two graduate students, and allow for the purchasing of equipment and materials needed for the completion of the project.

## Tim Clark Receives NIH Award

The National Institutes of Health is funding a research project directed by Assistant Professor Tim Clark in organic chemistry. The grant is for \$371,856 over three years starting July 2010, and will fund an MS student, three undergraduate students per year, student and faculty travel, and equipment and supplies. The proposed project uses a copper catalyst to add boron substituents to organic substrates. The resulting boron-containing products are versatile intermediates and can be used to form a variety of complex molecules, including portions of pharmaceutical targets.

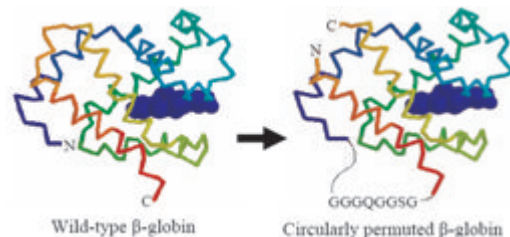


## Spencer Anthony-Cahill Receives NIH Award



Professor Spencer Anthony-Cahill received a renewal of an NIH R15 award supporting the generation and characterization of circularly-permuted hemoglobins. The 3-year, \$225,000 grant will support 3-4 students per year to work on the structural and functional characterization of three different hemoglobin variants. The long-term goal of the research is to design a variant of the normally four-subunit hemoglobin molecule that will include all four protein subunits on a single polypeptide chain. The resulting single-chain hemoglobin may have properties that make it a better oxygen-carrying therapeutic than is wild-

type hemoglobin. Current work in the Anthony-Cahill lab is focused on collection of NMR data for the permuted hemoglobins with various ligands bound (oxygen, cyanide, or no bound ligand). We are eager to compare these structural data to those for normal hemoglobin to assess how (if at all) our permutations have affected the structural features of the protein.



## Greg O'Neil Receives Dreyfus Award

Assistant Professor Gregory O'Neil secured the 2010 Jean Dreyfus Lectureship Award for Undergraduate Institutions for the WWU Chemistry department. Western was one of only four schools nationally to receive the \$18,500 award. In addition to stipends for two summer student researchers, the award also included funds to support expenses associated with bringing to campus a leading scientific researcher to give a series of lectures in the chemical sciences. Dr. Christopher Reddy, Senior Scientist in the Marine Chemistry and Geochemistry Department at the Woods Hole Oceanographic Institute and Director of the Institution's Coastal Ocean Institute, served as this visiting research scientist in February.



## John Gilbertson Receives Research Corp. Award



Assistant Professor John Gilbertson was awarded a SCIALOG grant (\$100,000 over two years) from the Research Corporation for a project titled "Artificial Nanoscale Enzymes for CO<sub>2</sub> Reduction Catalysis." This research is a collaborative effort between John Gilbertson, Raymond Schaak (Penn State), and Alan Heyduk (UC Irvine), which aims to investigate the reduction of CO<sub>2</sub> into useful chemical feedstocks. The reduction of CO<sub>2</sub> is an important challenge for the scientific community that would significantly impact both environmental remediation and energy storage/transport. Efficient reduction of CO<sub>2</sub> would provide a mechanism for the removal of this greenhouse gas from the atmosphere with the potential to stop or even reverse the effects of global warming. Furthermore, as one of the

products of liquid fuel combustion, a strategy for the conversion of CO<sub>2</sub> back into liquid fuels could provide a resource for storing energy from environmentally-friendly sources such as solar and wind, which have temporal profiles that do not necessarily match typical usage profiles. This group of scientists plans to utilize nanoparticle heterodimers to mimic the molecular environment that characterizes enzyme active sites for CO<sub>2</sub> reduction.

## NSF Major Research Instrumentation (MRI) Award

Janelle Leger, David Patrick and Steven Emory were recently awarded a Major Research Instrumentation (MRI) award from the NSF. This award provides \$282,266 for the purchase of an atomic force microscope (AFM) coupled to a biological optical microscope to support a varied program of research involving faculty and students in five different research groups at WWU. The instrumentation will be housed in the Advanced Materials Science and Engineering Center (AMSEC) at WWU and will be an integral part of a university-wide initiative promoting cross-disciplinary research and education in materials science. The instrumentation is necessary to support research in five academic departments (Chemistry, Physics, Geology, Biology, and Psychology), ranging from the study of brain function to magnetic thin films. In addition, the instrumentation will affect a number of other research groups and be used in about nine undergraduate science and engineering courses. Acquisition of the instrument will therefore not only impact specific research programs, but also help to catalyze and promote a broader, College-wide initiative in materials research and education.



# David Patrick on Sabbatical in Cambridge

I am spending the year in Cambridge, returning here after a long absence to visit and work with colleagues in the Chemistry Department where I was a researcher in the 1990's. I'm splitting my time between Chemistry and the BP Institute (yes, that BP), which is giving me the opportunity to branch out some from my usual focus on basic research and become involved with problems of more direct relevance to industry. Multinational oil conglomerates may not care much about the environment, but I've discovered they more than make up for it by caring a great deal about the quality of catering, serving a selection of wines and hors d'oeuvres good enough to make even the duller seminars well worth attending.

It's become relatively easy to teleconference across oceans and time zones, and so I have managed to maintain an active group of several graduate students and a talented undergraduate working hard at Western. I'm also embarking on some new projects here, which I'll bring back to Western in the fall.

It may interest newsletter readers to know that public education in England has been undergoing upheavals too, with large cuts in state support and tuition increases for most universities. I've spent a lot of time in Britain over the last 25 years and generally found much to admire about the education system here, but lately I'm afraid things have taken a turn for the worse. Just a few years ago I would have said that the average high school graduate in the UK received stronger academic preparation than their American counterparts. However my older daughter, who is in the equivalent of high school here, is finding she is now a year or more ahead in most subjects, particularly math and science. This was a surprise, since Cambridge has some of the best schools in the UK, and a change from the last time our daughters were in school here.

There is much to do in and around Cambridge. The museums here are very fine, I'm learning to ride a bike again, and vendors at the two large antiquarian book fairs held monthly in London have probably memorized my credit card number by now (what else could explain all those charges?). When the weather warms we plan to walk the length of Hadrian's Wall, something I've always wanted to do. If any newsletter readers have done that walk recently, I would welcome an e-mail with suggestions or tips.

From Cambridge,

David Patrick

The Chemistry Department is having an alumni event for chemistry alumni during the Back to Bellingham weekend. We will have a reception on Saturday, May 14th from 2-4 PM, which will be in the new conference room (CB 275) with faculty, students, and alumni and will include desserts and cocktails. Students will also be giving tours of the building, particularly of the new building addition. No registration is needed, so come on down!



**Back<sup>2</sup>011 Bellingham**  
WEEKEND  
May 13-15



# New Faculty

Chris Markworth joined the department in the fall of 2010 as a temporary instructor teaching courses in both the organic and general chemistry series. After growing up in Wilmington, North Carolina, Chris attended Dartmouth College where he was awarded an AB in biochemistry in 1993. Following college, he returned to North Carolina and worked as a chemist for GlaxoWellcome, applying automation to the synthesis of small drug-like molecules.

Having sparked an interest in drug discovery research, he decided to pursue an advanced degree and attended Indiana University to study natural product synthesis under Professor Paul Grieco. After his first year, Chris moved with his advisor to Montana State University in Bozeman, Montana, where Paul could have his cattle ranch, and Chris could continue his studies in the synthesis of marine natural products.

Upon completing his PhD in 2003, Chris returned to North Carolina to work in the biotech industry as a medicinal chemist. Most recently, he was involved in the pursuit of new treatments for neuropathic pain by the design and synthesis of subtype-selective inhibitors of voltage-gated sodium channels.

Chris's wife, Kim Markworth, completed her doctoral studies in education at the University of North Carolina at Chapel Hill in August 2010. As she was looking at her prospects for future faculty positions, Kim was excited to find an opening at Western. She jumped at the opportunity and is currently an assistant professor in the Math Department at Western where she teaches math education to future elementary and middle-grades math teachers.

Chris and Kim, along with their 2-yr old daughter Paige and their two dogs, moved to Bellingham in August. They are happy to be in the Pacific Northwest and look forward to exploring what Bellingham and the surrounding area have to offer.



Chris Markworth



David Rider

David Rider joined the Departments of Chemistry and Engineering Technology as an assistant professor in the fall of 2010. David grew up in Vancouver, British Columbia and completed his undergraduate degree at Simon Fraser University in 2002. For graduate school, he attended the University of Toronto and was awarded his PhD in chemistry in 2007. His research during this period focused on the synthesis and self-assembly of organometallic polymers. In the summer of 2007, David began a postdoctoral position at Canada's National Institute for Nanotechnology in Edmonton, Alberta and began investigating conducting polymers and nanostructured electrodes for plastic solar panels. David comes to WWU as a member the Advanced Materials Science and Engineering Center (AMSEC) and is eager to contribute to its role in educating students and driving interdisciplinary research. David will be teaching classes in general chemistry and plastics engineering technology as well as courses in the material science minor offered by AMSEC. David's research group aspires to use self-assembling polymers to engineer organic and inorganic semiconductors for responsible energy technologies like plastic solar cells and lighting devices. David is ecstatic to be at WWU and is grateful to the Departments of Chemistry and Engineering Technology and AMSEC for welcoming him with such kindness and enthusiasm.

David's homecoming to the Pacific Northwest has rekindled his appreciation for liquid sunshine (rain) and has made his and his fiancée's return to mountain biking and hiking trails a pastime that is funding the advanced membrane and self-healing technology sectors (rain gear and band-aids!).

## New Faculty (cont.)

Chuck Schelle joined the department in the fall of 2010 as an adjunct faculty member in general chemistry. Chuck grew up in Washington and attended Western as an undergraduate, obtaining his degree in chemistry in 2000. For graduate school, he attended the University of California at Santa Barbara and earned his MS in materials science and engineering in 2003. His thesis work focused on the prediction of materials that exhibit multiferroic behavior (materials that are both ferroelectric and ferromagnetic). It was during this time that Chuck began working with local high school students in physics and chemistry. He found the experience extremely rewarding, and thus decided to become a high school science teacher. He returned to Western to earn his teaching credentials in 2005 and subsequently was a secondary science teacher in Ferndale for 5 years.

At Western, Chuck teaches general chemistry courses and is very interested in developing unique teaching approaches for chemistry, while helping younger students grow as professional scientists. Chuck feels very fortunate to return to his alma mater as an instructor, and is happy to see familiar (and new) faces in the department. He looks back with fond memories of the experiences he had as an undergraduate.

Chuck is also delighted to live in such a beautiful place as ours. He loves to venture into the mountains for backpacking, and enjoys having the chance to fish and kayak in the beautiful waterways of the Northwest.



**Chuck Schelle**



**Tommaso A. Vannelli**

Tommaso Vannelli joined the Chemistry Department in the fall of 2010 as an adjunct professor teaching in the general chemistry series. Tommaso's interest in chemistry was sparked at an early age when his Italian grandfather explained to him the chemistry of his home darkroom. The days spent in the darkroom with his grandfather instilled in him an excitement for tinkering with chemicals. He is enthusiastic about being a part of Western's high-caliber Chemistry Department.

Tommaso graduated from Tufts University in 1995 with a BS in chemistry and a minor in environmental studies. He then continued doing research in the field of porphyrin synthesis and spectroscopy during his graduate education at the University of California-San Diego, earning his PhD in 2000. He then moved to San Francisco where, as a postdoctoral researcher at the University of California-San Francisco, he studied an enzyme from *M. tuberculosis* that is responsible for the activation of a widely used anti-tubercular drug called ethionamide. In 2004, Tommaso began his teaching career at San Francisco State University and, after three years as a lecturer and research associate, moved on to teach at Whitman College and Gonzaga University before accepting his current position at Western. Tommaso is looking forward to contributing to the general chemistry curriculum at Western as well as teaching other courses within his expertise. Tommaso's research interests lie at the interface of chemistry and biology. His research focus is on the development of novel compounds for applications in photodynamic therapy and the study of the metallo-enzyme arsenite oxidase as a possible biosensor component.

Tommaso is an avid rock climber and hiker. Look for him bouldering at WWU's climbing wall. He and his wife, Sabrina Gomez, also enjoy gardening and are planning to add a chicken coop to their home gardening enterprise.



## 2009 / 2010 Chemistry Awards

Outstanding Chemistry Department Graduate  
Cameron Moore

Chang Memorial Biochemistry Award  
Bryan Ager

Hypercube Scholar  
John Hayes

Outstanding Analytical Student  
Seth Swanson

Outstanding Organic Series Student  
Cameron Moak

CRC Press Freshman Chemistry Award  
Morgan Schurr  
Michelle Wuertth



Back Row (left to ight): Bryan Ager, Cameron Moore,  
Seth Swanson, Daniel Mosier  
Middle Row: Cameron Moak

Front Row (left to right): Michelle Wuertth, Morgan Schurr,  
Hannah Halliday, Jennifer Novotney

## 2010 / 2011 Scholarship Recipients



Back Row(left to right): Cory Lund, Loagan Yarbrough, Michael Pegis  
Middle Row(left to right): Cameron Moak, Jennifer Liddle, Benjamin  
Allen, Kyle Carter, Casey Medina  
Front (left to right): Amanda Norell Bader, Anna Chlebowski, Hannah  
Sturtevant

Knapman Senior Renewal  
Hannah Sturtevant

Knapman Junior Scholarship  
Cameron Moak

Barbara French Duzan Biotechnology  
Benjamin Allen  
Jennifer Liddle

Ruth Watts Female Research Scientist  
Amanda Norell Bader

Jerry Price/Nancy Sherer  
Michael Pegis

Verna A. Price  
Anna Chlebowski

Chemistry Fund  
Kyle Carter  
Cory Lund  
Casey Medina

WWU Tuition Waiver - Chemistry  
Nicole Koeppen  
Seth Swanson

Oscar E. Olson CST - Chemistry  
Loagan Yarbrough

Hach Scientific Foundation Chemistry Teaching  
Matt Lockett  
Korin Meyer



## Outstanding Chemistry Graduate



Cameron Moore

Cameron Moore was chosen as the Outstanding Graduate from the Department of Chemistry. During his time at WWU, he excelled in the classroom and in the research lab. Cameron was awarded the Analytical Student of the Year award and several scholarships from both the Chemistry Department and the Puget Sound Section of the American Chemical Society for his stellar academic performance.

Cameron was actively involved in undergraduate research in the laboratory of Professor Tim Clark where he worked on the development of the copper-catalyzed diboration of carbonyl compounds. Cameron took the opportunity to do two, full-time summers of undergraduate research. During the second summer he was awarded a nationally competitive Summer Undergraduate Research Fellowship from the ACS Division of Organic Chemistry. His work has resulted in one publication so far, with an additional publication forthcoming. Cameron also presented his research at several regional and national meetings and conferences.

Cameron is currently a first-year graduate student at the University of Michigan where he is working toward a PhD in inorganic chemistry. He was awarded a Rackham fellowship to support his first three years of study at the University of Michigan.

## Lowell Eddy Fellowship



Ben Allen

For the summer of 2010, Ben Allen received the Lowell Eddy Memorial Fellowship for undergraduate research. During the last two years, Ben has been working on a collaborative project between Assistant Professor Spiegel's lab and Assistant Professor Heather Van Epps' lab in the Biology Department. He has studied RNA-processing proteins that affect synapse and axon formation in neurodevelopment. To complete his project, Ben has used molecular cloning of genes, protein purification of proteins involved in synapse formation, and characterization of novel protein-protein interactions.

Ben has also been an active member of the department. He was a teaching assistant for the biochemistry lab this fall and has participated in a variety of Chem Club events. Upon completion of his undergraduate studies, Ben plans to enroll in a PhD program in the biochemical sciences next fall.

## Sea Bong Chang Award



Bryan Ager

Bryan J. Ager was selected as the 2010 recipient of the Sea Bong Chang award, which honors the outstanding student in Biochemistry. Bryan graduated with a cumulative GPA of 3.96 and approached his studies with a voraciousness that was noticed by many professors that had the opportunity to have him in class. While Bryan was an exceptional student in the classroom, he also distinguished himself in the research lab. During the summer of 2009, Bryan accepted an NSF Chemistry Summer Undergraduate Fellowship at the UC Irvine, to work in the lab of Prof. Keith Woerpel. Following his summer project, Bryan was able to publish his findings as a first author in *The Journal of Organic Chemistry*. When Bryan returned to WWU in the fall of 2009, he started another research project with Prof. Spiegel studying the structure and stability of the blood coagulation protein, factor VIII. Bryan, along with his classmate J. Nate Perkins, were able to express, purify, and crystallize the porcine version of the factor VIII C2 domain, which has provided a critical starting point that will lead to looking at the atomic structure of this protein in the near future. Bryan was also active throughout the Department and the University, serving as a TA in both the Chemistry and Biology Departments and working as a CPR instructor for the Prevention and Wellness Services Department. In addition to all that Bryan has done for WWU, he has also been an active volunteer for several organizations. He plans on attending medical school in the fall of 2011.

# Class of 2009 / 2010

Congratulations to our graduation class of 2009/10. Graduation honors and research group affiliation are listed after each graduate's name.

## MS Chemistry

Kevin Bufkin	Patrick Research Group
Melissa McIntosh	Clark Research Group

## BS Chemistry and ACS Certification

Willie Benjamin	Gilbertson Research Group
Travis Birse	
Matthew Black	O'Neil Research Group
Tristan Butler	Gilbertson Research Group
John Campiche	Smirnov Research Group
Jonathan Clark	
Kacia Emley	
Hannah Halliday	2009/10 Chemistry Club Service Award; Gilbertson Research Group
Joel Hanson	Clark Research Group
John Hayes	Magna Cum Laude; University Honors Program; Chemistry Research Honors; 2009/10 Hypercube Scholar; Bussell Research Group
Peter Im	Prody Research Group
Nicholas Isley	2009/10 CST Olson Scholarship; Clark Research Group
Peter Johnston	Raymond Research Group
Alexander Kendall	Gilbertson Research Group
Adam Kopysc	
Sarina Lariviere	
Janell Longstreth	
Lisa Mammoser	Kriz Research Group
Anthony Mason	
Cameron Moore	Magna Cum Laude; 2009/10 Outstanding Chemistry Dept Graduate; 2008/09 Outstanding Analytic Student Award; 2009/10 CST Olson Scholarship; 2008/09 Tuition Waiver Scholarship; Clark Research Group
Daniel Moser	2009/10 Chemistry Club Service Award; O'Neil Research Group
Jennifer Novotney	Magna Cum Laude; Double Major BS-Math; University Honors Program; 2009/10 Chemistry Club Service Award; 2006/07 Outstanding General Chem Honors Award; 2009/10 Ruth Watts Scholarship; 2008/09 Chemistry Fund Scholarship; Patrick Research Group
Ashley Pinch	
Christopher Porter	Vyvyan Research Group
Matthew Quarterman	Bussell Research Group
Matthew Regan	
Michael Scullywest	
Brian Sims-Fahey	Prody Research Group
Samantha Sommer	Gilbertson Research Group
Jason Stein	Lampman Research Group
Robert Thompson	Patrick Research Group
Aphrodite Toth	
Rachel Werther	Anthony-Cahill Research Group

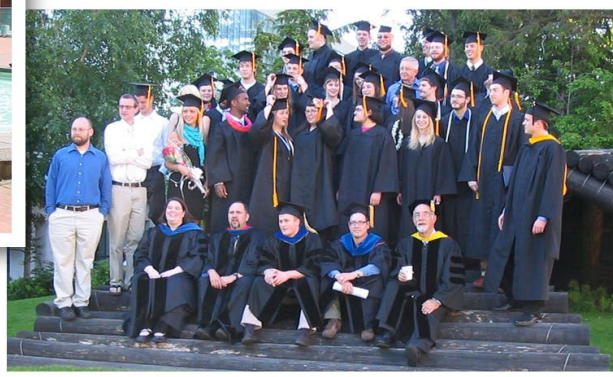
# Class of 2009 / 2010

## BS Biochemistry

Bryan Ager	Magna Cum Laude; 2009/10 Chang Biochemistry Award; 2008/09 and 2009/10 Knapman Scholarship; Spiegel Research Group
Jacob Brockerman	Smirnov Research Group
Jennifer Czapinski	
Marceline Finda	
Jacob Herman	WWU Honors Program; Chemistry Research Honors; Spiegel Research Group
Kasey Hostetler	Spiegel Research Group
Andrea Larson	
Rebecca Lefavor	Smirnov Research Group
Mathew Lockett	Borda Research Group
Kelsey Motanic	2009/10 Woodring Scholarship; Vyvyan Research Group
Michael Murphy	Leger Research Group
Christopher Myers	Prody Research Group
Jonathan Perkins	Spiegel Research Group
Troy Pero	
Kevin Pinneo	
Katie Tallman	2009/10 Duzan Scholarship; Vyvyan Research Group
Geoffrey Traeger	Spiegel Research Group
Peter Ye	WWU Honors Program; Chemistry Research Honors; 2009/10 Price/ Scherer Scholarship; Lowell Eddy Scholarship; Anthony-Cahill Research Group

## BA Chemistry

Steve Fishman  
Kelly Thees





# Thank You to Chemistry Dept Donors

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We wish to thank the following alumni and friends of the department who donated to the following Chemistry Department Western Foundation Funds during the 2010 calendar year. Donations during the past year funded a variety of activities, including scholarship matching, academic awards, undergraduate research projects, department seminar program, and events for department majors and alumni.

## Chemistry Fund Donors

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Mark and Donna Aarstol	Dan Miller
Bryan Ager	Karen and Joseph Morse
Yaw Agyei	Eugene and Frances Munson
Kelli Arntzen and Joseph Erickson	David Nelson
James and Gail Assink	Jennifer Novotney
David Bishop	Dennis Olson
Jeff Bullock	Don Overmiller and Emilie Fogle
Laura Cazares	John Peterson
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John and Heloise Logan	Sheryl Wood
Jeffrey May	Sophia Zervas-Berg and Arvid Berg



# Thank You to Chemistry Dept Donors

## Eddy Memorial Chemistry Fellowship

Bill and Trudy Kindler

## Knapman Scholarship Endowment

Janet & Bob Harris

## Hach Science Education Scholarships

American Chemical Society Hach Scholarship Endowment

## PLK Organic Endowment

George and Carolyn Kriz

Jim and Cathy Vyvyan

## Wicholas Research Endowment

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Robert and Jeanette Mustacich

Terry and Maureen Smedley

Thomas Wolford

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Gary Carlton ..... Design

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Carbon	Helium	Magnesium	Iodine	Sulfur	Tritium*	Yttrium				

# Chem Club Receives Commendable Chapter Award

For the third year in a row, the Student Chapter of the American Chemical Society at Western Washington University (aka Chem Club) has received a Commendable Chapter Award from the ACS in recognition of its outstanding activities and efforts. Nationally, only 73 other ACS student chapters were chosen for this award for the 2009-10 academic year. In addition, the Chem Club received its third consecutive *Green Chemistry Chapter Award* for its efforts to promote the integration of environmentally benign technologies in academia and industry. The ACS formally recognized Western's Chem Club in the November 2010 issues of *Chemical & Engineering News* and *in Chemistry* magazines; the student chapter was given award plaques at the ACS National Meeting in Anaheim, Calif.



Amanda Norell Bader, a double major in chemistry and physics, was president of the 2009-10 Chem Club. Both chapter awards stem from the Chem Club's submission of the student chapter annual activity report which Amanda was responsible for preparing. Amanda is currently serving a second term as chapter president for the 2010-11 academic year. Next fall she will enter graduate school at the University of Colorado where she will pursue a PhD in materials chemistry.

Prof. Emory and Prof. Raymond serve as co-advisors for the Chem Club. Both are very proud of the tradition of service to the department and community that current and past students have helped establish at Western. They look forward to continuing to work with such a great pool of diverse and energetic students. They also welcome any support and suggestions alumni or friends of the department may have for the Chem Club. 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).

### Bowling Night

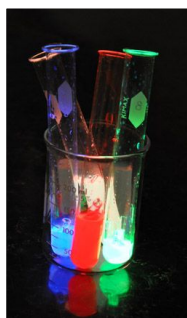


### Mt Vernon Kids Visit





# Chem Club Receives ACS National Award (cont)



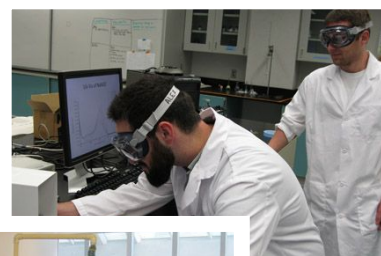
Boy Scouts Visit



Compass to Campus



Chemistry Open House



Earth Day Cupcakes!



# Scholars Day Colloquium

Our annual Scholars Day was held on May 21, 2010. The keynote speaker was Joseph Lakowicz, Professor of Biochemistry and Molecular Biology, University of Maryland with his talk entitled "Plasmon-Controlled Fluorescence and Biomedical Applications."

Of the 105 posters presented, 40 were authored by Chemistry students (32 undergraduate posters, 8 graduate posters, and 5 Honors oral presentations). Students from Chemistry received a number of the awards from Sigma Xi including;

Best Graduate Student Poster:

Justin D. Walter and P. Clint Spiegel. Understanding the basis of ribosome-mediated GTPase activation.

Undergraduate Poster Awards:

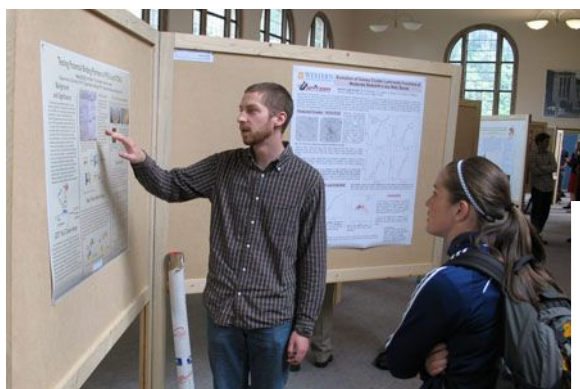
Hannah S. Halliday and John D. Gilbertson. Synthesis and Characterization of Dendrimer Templated Copper and Gold Nanoparticles.

Jen Liddle and Spencer Anthony-Cahill. Mapping the fibril-forming process via tryptophan fluorescence and atomic force microscopy.

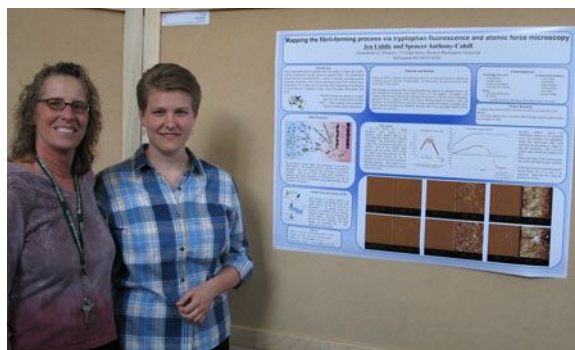
Cameron M. Moore, Casey R. Medina, Melissa L. McIntosh and Timothy B Clark. Cu-catalyzed diboration of aldehydes and applications in Matteson homologation reactions.

Samantha K. Sommer, Alexander J. Kendall and John D. Gilbertson. Hydrogen Bonding in the Secondary Coordination Sphere of Zinc and Iron Enzyme Mimics.

Hannah Sturtevant, Sherry Funston and Steven R. Emory. Fabrication and characterization of a fiber optic pH sensor.



Ben Allen, Kelsey Anderson

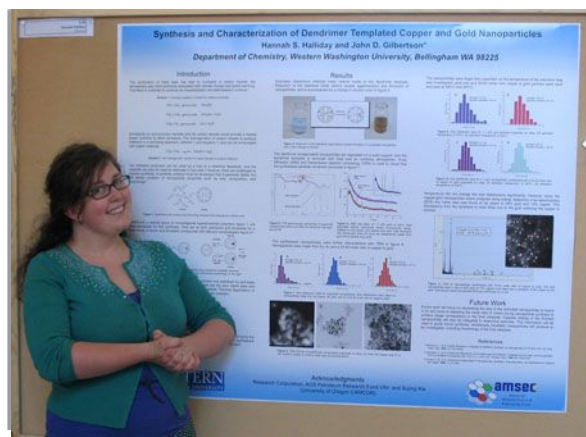


Gerry Prody and Jennifer Liddle





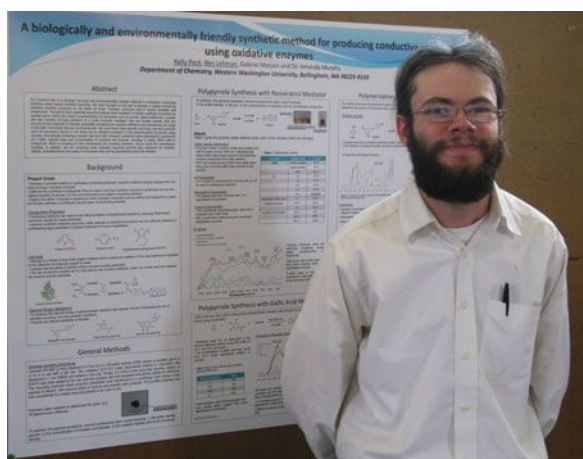
# Scholars Day Colloquium



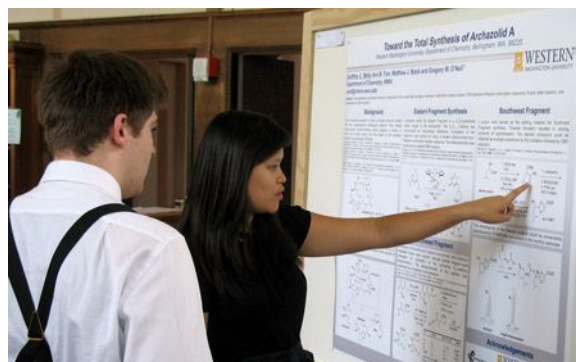
Hannah Halliday



Bryan Ager, Matt Lockett, Michael Murphy



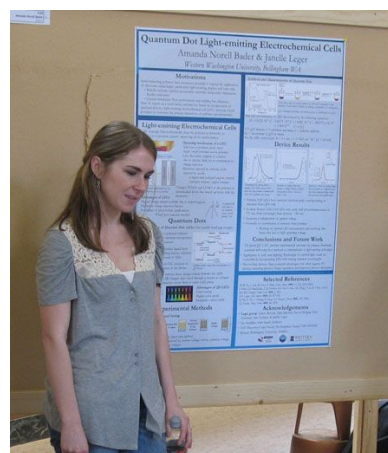
Gabriel Matson



Ann Tran



Alica Smith



Rebecca Lefavor



# Chemistry Picnic at Fairhaven Park



The 2011 Chemistry Picnic will be held on Saturday, May 28th at Fairhaven Park