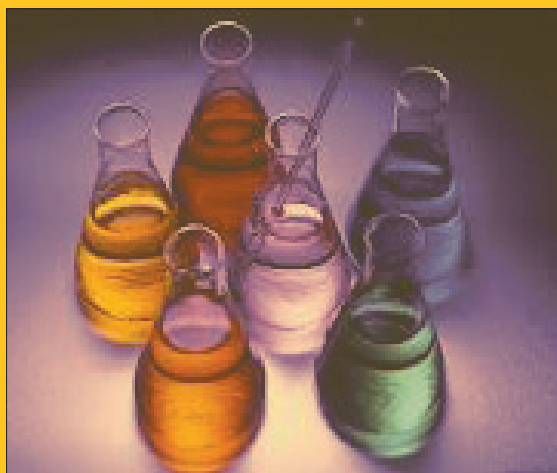




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**CHEMISTRY  
NEWS**

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#### LETTER FROM THE DEPARTMENT HEAD

This is my seventh and last newsletter. Professor Keith Carron will take over as Department Head beginning in Fall semester 2012. The past seven years have been the period of greatest change in the Department of Chemistry in at least 40 years. Professors David Jaeger, Robert Hurtubise and Suzanne Harris all retired within the past seven years and Professors Dan Buttry and Jeff Yarger both left the Department for other challenges. In addition, we also lost our friend and colleague Professor Patrick Sullivan. Dramatic changes also present new opportunities and the faculty and staff have worked hard to take advantage of these opportunities. Some of the more noteworthy accomplishments during the past seven years include: (1) nearly 50% of the departmental faculty were hired including a School of Energy Resources Professor. This meant numerous seminars, research presentations, and hosting of candidates; (2) a new one-million dollar Nuclear Magnetic Resonance (NMR) facility was acquired and installed; (3) three National Science Foundation (NSF) Career Awards were received by departmental faculty; (4) a new system to assign required teaching duties to the analytical, inorganic, organic, and physical chemistry divisions was implemented; (5) the graduate student population more than doubled; (6) a new accounting system was put into place to make the departmental budget more transparent; (7) the department survived a major renovation of the physical science building that updated the buildings air handling system resulting in the installation of new hoods; (8) department faculty worked hard to make certain that the chemistry space in the new ENZI building was appropriate for the future of our undergraduate laboratories; (9) the inaugural presentation of our new lecture series entitled "Frontiers in Physical Chemistry" was given by Professor Arthur Suits from Wayne State University during spring 2012; (10) the college allocation of graduate assistants (GAs) to the department was supplemented with several additional GAs from the School of Energy Resources and from the Office of Academic Affairs; (11) the support budget was dramatically increased to provide more money for the undergraduate laboratories; (12) a mentoring system for new Assistant Professors was implemented; (13) the department increased its GA stipend and saw an immediate effect on applications to our graduate program; (14) an additional staff position was added to our front office; and (15) the B. Patrick Sullivan Undergraduate and Graduate Travel Award Fund was put into place. These accomplishments allowed us to continue to provide outstanding educational experiences to both our undergraduate and graduate students even during

the dramatic upheavals taking place in the Department.

In October the Department of Chemistry hosted an open house and ribbon cutting ceremony for the new University of Wyoming High-Field Nuclear Magnetic Resonance Facility. The Bruker New Avance III 400 MHz and 600 MHz NMRs with superconducting magnet systems incorporating Ultrashield Plus design that significantly reduces the stray field are now both installed and operational in the basement of the Physical Science Building. The 600 MHz instrument is equipped for both solution and solid-state operation. This state-of-the-art facility is expected to enhance collaborative interactions across campus especially in the area of chemical biology.

The national and international stature of our faculty continues to grow. The National Science Foundation (NSF) recently announced that Professor Jing Zhou received a Career Award. According to NSF "The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations." Dr. Zhou realizes that exciting developments at the forefront of her research effort in nanoscience and surface science can be used to generate enthusiasm for science in her students. She also recognizes that she is in a unique position to act as a role model for aspiring female scientists and is determined to work hard to reach out to underrepresented minority and female students.

I am also very happy to report that Dave Anderson's request to be considered for promotion to Full Professor was received very favorably by the Department. I anticipate that his promotion will be approved by the Board of Trustees prior to the next academic year. Professor Anderson joined the Chemistry Department in 2000 after receiving his B.S. degree from George Washington University, his Ph.D. from Dartmouth College, and a postdoctoral appointment at the University of Pennsylvania. Professor Anderson is an international expert in matrix isolation spectroscopy and is recognized as one of three world-leading experts in using solid molecular parahydrogen as the matrix. His contributions in examining chemical reactions and in particular photochemical induced chemical reactions in this unique environment represent ground-breaking accomplishments. Professor Anderson is also an outstanding instructor who contributes to our educational efforts both in our General and Physical Chemistry programs.

The design of the new ENZI building has begun in earnest. This building is a 50 million dollar 60,000 square foot facility that will house lower division undergraduate laboratories in several disciplines. The space in the Physical

Science Building previously used by our General Chemistry and Organic Chemistry programs will be converted to much needed space to support our rapidly expanding research program. This new building will be located on the north side of Lewis Street at the corner of 10th and Lewis.

This past year the Physical Science Building underwent a major upgrade in its air handling system. This resulted in a major disruption in our research effort during the summer and part of the Fall semester. However, we now have very nice new hoods and much better climate control in our laboratories. (See some pictures of the renovation later in this newsletter.)

The Department continues to bring in outstanding scientists from around the world for our vibrant speaker program. These lectures provide our students with compelling evidence of the growing importance of chemistry to a wide variety of interdisciplinary research efforts.

Your help in the past seven years has been indispensable. I know that you will continue to support the Department of Chemistry under the very capable leadership of Professor Carron. You can keep abreast of chemistry department events by visiting our website at <http://uwadmnweb.uwyo.edu/Chemistry/>. You might even recognize an old friend on our new alumni page. Please continue to stay in touch and make us aware of your accomplishments.

Best Regards, *Ed Clennan*

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## BUILDING CHANGES

*By Frank Barrows*

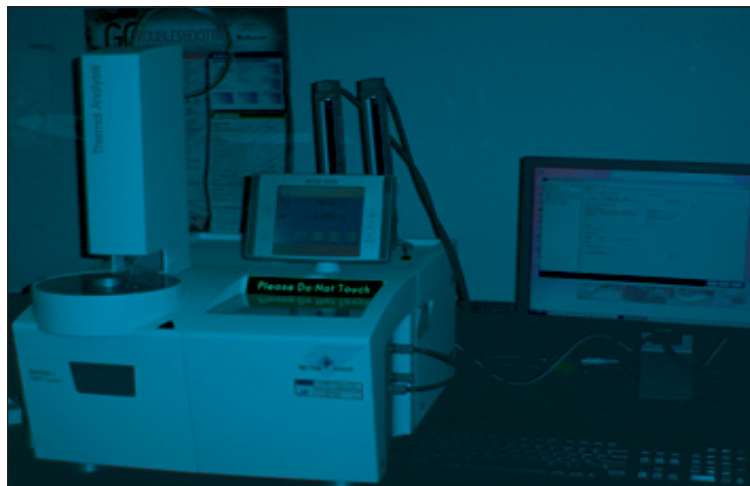
The Physical Sciences building underwent an infrastructure remodel last year that replaced the laboratory HVAC system and 70 fume hoods. Also, a fire sprinkling system, a generator for emergency backup power, and some new lighting were installed. Major safety and comfort issues were addressed with the new ventilation system which provides air pressure control to each lab. This work was funded by the American Recovery & Reinvestment Act (AARA) and totaled \$10,000,000. A project of this magnitude would normally take two or more years to complete but this project was compressed into a 10 month time period. Left: Old Fume Hood, Below: New Fume Hood.



## NEW LABORATORY EQUIPMENT

*By Navamoney Arulsamy*

The department acquired a number of new equipment to bolster teaching in its laboratories. Among them are an FTIR Spectrometer (Bruker Alpha), a new state of the art Thermo-Gravimetric Analyzer (Mettler Toledo TGA/DSC 1), and a Scanning Probe Microscope (Nanoscience). The new tools have greatly enhanced the undergraduate laboratory curricula in all branches of chemistry. The FTIR is a classic characterization technique widely used by the chemical and pharmaceutical industry. The Bruker Alpha is equipped with an ATR (Attenuated Total Reflectance Accessory). Thanks to the new FTIR, undergraduate students of organic chemistry laboratory courses are now able to quickly collect high quality IR spectra. The TGA/DSC makes it possible to study the thermal properties of a variety of materials including synthetic metal organic frame (MOF) complexes for hydrogen-storage, photo-catalysts, coordination complexes, organic compounds and organic polymers. The sample robot of the TGA/DSC allows automated data acquisition for dozens of samples generated in the undergraduate teaching laboratory. Similarly, the SPM has expanded the Physical Chemistry laboratory to include new experiments in scanning tunneling microscopy and atomic probe microscopy.





## NAVAMONEY ARULSAMY



Research scientist  
**Navamoney Arulsamy**  
taught Advanced Inorganic Chemistry Lab (CHEM 4100) in the Fall 2011 semester. He modified the syllabus with the inclusion of a new experiment concerned with the

synthesis of a series of metal organic framework (MOF) complexes. Another experiment on solar energy harvesting by Gratzel cell, introduced in 2010, was fine-tuned and offered again. This experiment continues to receive great interest from the students. Although the SFSF renovation work caused several problems during the fall semester, the lab has benefitted greatly: we now have a well-ventilated lab. **Arulsamy** is in charge of the Departmental X-ray, EPR and ESI-MS facility. He assisted students and other researchers in the use of the instruments, and trained a number of new students and postdoctoral fellows in powder diffraction data collection methods. **Arulsamy** also accomplished significant amount of research working in his lab. Three undergraduate students contributed to his research. The students presented two posters at the UW undergraduate research day. The research has resulted in one manuscript (submitted for publication), and further work is continuing with a new undergraduate student.

## FRANCO BASILE



The 2011-2012 academic year proved to be challenging due to the much needed, but highly “painful”, Physical Science building renovation during the summer months. We all had to share our working space with workers with hard hats, demolition saws and asbestos suits, not the most productive environment to conduct research. Our delicate instrumentation was constantly being moved and/or covered to protect it from the imminent and daily dust clouds. Our group

continues to grow and currently has 10 graduate students: **Mr. Sujit Kandar, Miss Joanne Slatter, Mr. Chenglin Liu, Miss Rong Zhou, Mr. Liang Lu, Mrs. Gwendoline Toh, Mr. Raj Mahat, Miss Zoe Gao, Mrs. Jenna Milliken and Mr. Tristan Kinde** (who is co-advised with Prof. Dutta). Also, this Spring 2012 semester we have working in our lab four undergraduate students. Our research in Analytical Chemistry and Mass Spectrometry is currently focusing toward the analysis of proteins in tissues sections, the analysis of intact bacteria and the rapid preparation of biological samples for bio-medical research. We are using the technology we developed during our DoD contract towards the development of a “Non-Enzymatic Proteomic Reactor”, a device that could significantly simplify and speed up the preparation of biological samples for Mass Spectrometry analysis. Our lab is also venturing into new areas of research, mainly in the analysis of naphthenic acids, a family of toxic compounds known to be present in crude oil and coal that cause significant losses in the energy industry and pose an environmental risk to water sources. In all, we are all looking forward to a productive and dust-free 2012 summer in the lab!

## CARLA BECKETT



My fall semester started off by assisting with the Sneak Peek program the week before classes started. I met some interesting incoming freshmen students and enjoyed visiting with them and answering questions about campus and classes. I taught the Introductory Chemistry course (CHEM 1000) again this fall. In addition, the laboratory portions of CHEM 1020 and CHEM

1030 used a new lab manual so that kept me very busy trouble shooting and making sure all the new experiments worked! (Dr. Goodson and I rewrote a manual that was previously written by former UW faculty members Dr. Guzzo and Dr. Pfeiffer). The labs went smoothly for the most part and I look forward to improving them as we use them for a second semester.

In the spring semester I am teaching General Chemistry II (CHEM 1030). I am also on the planning committee for the new Enzi STEM teaching building, which will house the 1000 and 2000 level chemistry courses. This is a most interesting committee to be on and it is exciting to be able to participate in planning what will be in our new teaching labs!



## KEITH CARRON



The **Carron** group focused on our Lab-on-a-Bubble technology this year. The Lab-on-a-Bubble concept is very interesting from an analytical chemistry perspective for sensitive detection and it also sparks

my interest from the physical chemistry aspect of dynamic processes in focused laser beams. **Virginia Schmit** (2011) finished her Ph.D. in the fall and has started a post-doc with **David Liberles** studying DNA mutations and their relation to evolution. **Virginia** compared the Lab-on-a-Bubble approach with paramagnetic particles and neutral density particles for her Ph.D work. Our work developing and studying nanoparticles on buoyant silica bubbles led to a publication, Lab-on-a-Bubble: Synthesis, Characterization, and Evaluation of Buoyant Gold Nanoparticle-Coated Silica Spheres, in JACS this fall. This work included assistance and co-authorship from two UW alumni, **Rich Martogolio** (Ph.D. 2002) who spent the summer with us as a visiting professor from Depauw University, and **Aaron Strickland** (Ph.D. 2004) who collaborated via his company iFyber in Ithaca, NY. **Brandon Scott**, a second year student in our group, also co-authored the JACS publication with time-dependent Raman experiments on our nanoparticles to demonstrate one of the advantages of bubbles. **Brandon** started his NSF STEM Fellowship teaching kindergarten through 12th graders about nanoparticles. He will continue his Ph.D. studying dynamic scattering processes of colloidal particles.

## ED CLENNAN



Ed Clennan's research group during the 2011-2012 academic year consisted of five graduate students, **Xiaoping Zhang**, **Mohammad Assiri**, **Thomas Bakupog**, **Sean Hoskins**, and **Mikel Walbridge**, who is a B.S./M.S. candidate in the Chemical and Petroleum Engineering Department

but is doing his research in our group. During the summer we also hosted a National Science Foundation REU student, **Emiliano Jimenez Alvarez**. The group is involved in two different research projects. We are still interested in organic photochemistry and in particular in the design and use of new electron transfer sensitizers. We are also involved in a materials chemistry project that involves embedding an addressable functionality into polycyclic aromatic hydrocarbons. This particular project involves photochemistry, electrochemistry, and synthesis. During the past calendar year we published 5 peer-reviewed manuscripts in the Journal of Physical Organic Chemistry, in Tetrahedron Letters, in Photochemistry & Photobiological Sciences, in Journal of Luminescence, and in the Journal of Organic Chemistry.

Ed was busy this past year serving as a discussion leader at a Gordon Conference in New Hampshire and attending the National American Chemical Society Meeting in Denver. He is still also the Editor of the Journal of Sulfur Chemistry and he is on the Editorial Board of the Journal of Physical Organic Chemistry.

## ROBERT CORCORAN



In the last year, the **Corcoran** group has continued to examine aspects of the application of organic chemistry to microfluidic systems. Graduate student **Fidelis Ngwa** has continued his work on the preparation of novel substrates for microfluidic ELISA assays, and has branched out

towards preparing channel surfaces that will show lower levels of non-specific binding of proteins. Graduate student **Melissa Gelwicks** has been working on photochemically mediated methods for patterning channel surfaces, as well as release of acids, bases and enzyme substrates in the bulk solution phase of channels. **Melissa's** work has been supplemented by the efforts of undergraduates **Tom Dawson** (currently in his first year of chemistry graduate school at the University of Virginia), **Ada Chung**, and **Mark Nelson**, all of whom have been involved in the preparation of charged photolabile protecting groups. Undergraduate **Melissa Hoyer** has been working on an entirely different approach to suppressing background signal in microfluidic ELISA assays, by selectively removing the undesired, unbound antibody-enzyme conjugates that are the source of the unwanted signal.

## DEBASHIS DUTTA



The Dutta research group at this point comprises five graduate students, **Tristan Kinde, Naoki Yanagisawa, Ling Xia, Basant Giri and Ravi Peesara**. Currently, the group is involved in several projects focused on

designing microfluidic devices relevant to analytical chemistry and energy applications. While **Ling's** projects are focused on designing enhanced electrophoretic and chromatographic separations in micro- and nanoscale channels, **Tristan** is working towards designing portable devices for bio-detection applications in a joint effort with Prof. Basile's group. **Naoki, Basant** and **Ravi** on the other hand (in collaboration with Prof. Corcoran) are involved in developing novel microfluidic assays that have the potential to significantly enhance the sensitivity of ELISA methods. In addition, **Naoki** is also looking into the design of a new kind of nanofluidic battery. **Basant** and **Ravi** passed their preliminary examinations the past year, while **Tristan** is trying to wrap up his dissertation project. Prof. **Dutta** received tenure and promotion the past summer and looks to further build on his research success. This year is expected to be a busy one in terms of publications. Research in Prof. **Dutta's** group is currently funded by the US Department of Defense (jointly with Prof. Basile) and the National Science Foundation.

## PATRICIA GOODSON



This academic year, my teaching responsibilities have focused on general chemistry (CHEM 1020, General Chemistry I and organic chemistry, CHEM 2420, Organic Chemistry I, and CHEM 2300, Introductory Organic Chemistry). Associated with the labs in general chemistry, over the past several years, we have become concerned with the ever-increasing costs of commercial general chemistry lab

manuals. During Summer 2011, Professor Carla Beckett and I developed laboratory manual course packets for these

two general chemistry courses. We were given permission from Dr. Tony Guzzo, professor emeritus, to use work from his laboratory manual "Exploring General Chemistry in the Laboratory." The experiments in the resulting course packets ranged from simple revisions of Guzzo experiments to completely new experiments. During the Fall 2011 semester, I was invited to serve on the chemistry discipline panel for NANSLO (North American Network of Science Labs Online) which reviews experiments for and gives advice to the Western Interstate Commission for Higher Education associated with their Gates Foundation Next Generation Learning Challenges Grant. On a personal note, this past summer my husband (Dean Roddick) and I celebrated our 25th wedding anniversary with a two week trip to Italy.

## JOHN HOBERG



Research in the **Hoberg** group continues to involve a mixture of organic synthesis and catalysis related to energy related projects, specifically the splitting of water using photocatalysts, and organic catalyzed transformations. **Alyssa Pearson**, a PhD student, has been working on the synthesis of N-Heterocyclic carbene ligands that complex to

rhenium through a "southern" bipyridine moiety but will also complex to other metals at the "northern" carbene moiety. She continues to develop our rhenium chemistry in closely related projects for the formation of H<sub>2</sub> gas, and is funded by an SER PhD graduate assistantship. Three undergraduate students are also performing research in the group - **Carrie McCarthy, Jennifer Morkemo** and **Kelsey Thrush**. **Carrie** has been funded by both an A&S undergraduate summer research award and a Nielson Excellence Fellowship. Both **Carrie** and **Jennifer** are working on the design of new ligands for the splitting of water. **Kelsey** has been constructing inositol-based ligands that will be connected to metals for use in asymmetric catalysis of organic molecules. Inositols are carbohydrates that can exist as a pair of enantiomers and thus are able to mediate reactions in a stereoselective manner. Several papers were published in these areas in 2011 in the following journals: Dalton Trans. (pg. 7534), Eur. J. Org. Chem (pg. 4465) and I. J. Org. Chem (pg. 37).

Dr. **Hoberg** was also awarded a "Thumbs Up" award from the A&S student council and a "Top Prof" award from the Mortar Board in 2011.



## JAN KUBELKA



Research in **Jan Kubelka's** group focuses on some of the fundamental problems in modern biophysics: understanding how proteins fold, bind substrates and carry out biological functions. We are also interested in vibrational spectroscopy of biomolecules, in particular in understanding the complexities of protein

infrared spectra in solution. The group currently consists of four graduate students, **Ben Anderson**, **Ginka Buchner**, **Jason Lai** and **Will Welch**, and two undergraduates **Elizabeth Cleverdon** and **Borden Ball**. **Ginka** and **Elizabeth** focus on protein folding experiments, while **Ben** with **Borden** work on simple model compounds, such as amino acids and short peptides. **Jason** and **Will** work on computational projects. In the past twelve months we have published five journal articles and presented four posters at the 56th Annual Meeting of the Biophysical Society (San Diego, CA). We are grateful to the National Science Foundation CAREER grant for supporting our work.

## BRIAN LEONARD



The **Leonard** research group has continued to grow during the last academic year with the addition of two new graduate students, **Samantha Schmuecker** and **Cassandra Watts**. In addition to the new graduate students, two new undergraduates, **Jack Stacy** and **Kyle Duffee**, also joined the

group. **Jack** is a double major in Chemistry and Chemical Engineering and **Kyle** is an ACS certified Chemistry major. We also had a summer student **Nicole Ramos** who was part of the NSF Research Experience for Undergraduates program. **Nicole** has recently been accepted to the graduate program at the University of Alaska Fairbanks and will be pursuing a PhD in environmental chemistry. Another former student, **Nick McDougall** graduated with his B.S. in chemistry last summer and has taken a position at Midcontinent Testing Laboratories in South Dakota. Research in the **Leonard** lab is starting to take off with several projects involving the synthesis of metal carbide nanomaterials. **Greg Watezig** will be presenting his findings about metal carbide nanotubes in a poster session at

the spring National ACS meeting in San Diego. **Brian** will also be attending the ACS meeting and hosting an awards session for his PhD advisor **Raymond Schaak** who will be receiving the National Fresenius Award. **Yagya Regmi** passed his preliminary exam this spring and has become the first graduate student in the **Leonard** lab to be a PhD candidate. Congratulations!! The group has grown and changed quite a bit over the last year and is looking forward to an exciting and productive year in our recently renovated lab space.

## MARK MEHN

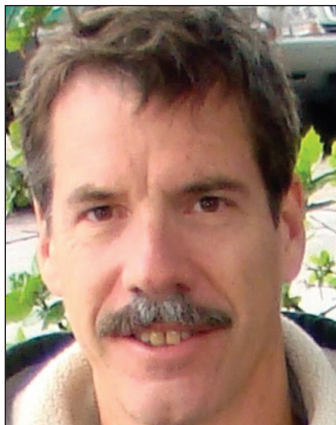
It has proven to be a busy year in the **Mehn** Group. **Dylan Houghton** has secured a post-doctoral position with the



National Academies Research Associateship Program and looks forward to starting his work at the Air Force Academy in Colorado Springs. Congratulations and Good Luck Dylan! The 2nd year graduate students **Philip Miller** and **Suman Debnath** are preparing their thesis proposals. **Suman** is thankful for a UWyo School of Energy Research Graduate Assistantship and **Philip** has been working with the NSF-GK12 program. As part of the Molecular

and Cellular Life Sciences Program, we also welcomed two rotation students, **Wenjie Huang** and **Yina Li**, into the lab over the last year. Multiple undergraduates have worked in the lab over the past year including: **Dana Loutey**, **Mackenzie Norlin**, **Patrick Dilsaver**, and **Lambert 'Nike' Kabwar**. **Dana** was an NSF-REU student from Reed College in Oregon. **Pat** will graduate in May and plans to continue on to graduate school in chemistry. **Mark** has been giving talks and presenting posters at universities across the US, as well as at conferences throughout the states and internationally (about 12 total in the past year). **Mark** was also awarded a College of Arts and Sciences Extraordinary Merit in Teaching Award during the fall of 2011. He is thankful for the nomination from the Department Head, Ed Clennan, and for the recognition.

## DEAN RODDICK



The **Roddick** group survived the summer 2011 building renovation- in compensation for weeks of messy 90+ degree unventilated laboratory work conditions, we now have four nice new hoods and better air-handling. Our group is currently running with four graduate students and a postdoctoral researcher.

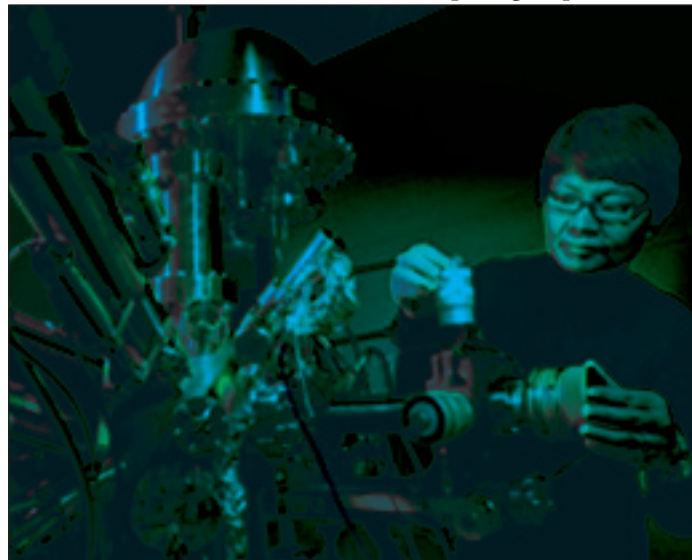
**Jeramie Adams** is wrapping up our DOE-supported Re(II) polyphosphine photo superoxidant project this spring, and his research on iridium pincer complex catalysis has been published this year. **Jeramie** is also working with undergraduate **Bradley Schmidt** to finish a paper on chelating phosphine effects on platinum ethylene dimerization catalysis. **Bradley** received the Schierz Scholarship in 2011 for his undergraduate research, and continued his work in our lab this past summer. **Bradley** presented a poster on his research at the Fall 2011 Denver National ACS Meeting.

**Brian Gruver** defended his Ph.D. thesis on ruthenium PCP catalysts this past December and presented a talk on his research at the Fall National ACS Meeting in Denver. **Brian** is currently back in Iowa looking at both teaching and research opportunities. **Brian's** paper on ruthenium hydrocarbon dehydrogenation catalysis was published last Fall and was also selected for the journal cover (Vol. 30, No. 19, October 10, 2011). **Brian** has recently accepted a position as Laboratory Manager for Koch Fertilizer, LLC, which runs an anhydrous ammonia plant in Fort Dodge, IA (coincidentally Brian's home town!)

**Thomas Parson** continues his work on alkene insertion chemistry for both  $(dfep)Pt(alkyl)(alkene)_+$  and related nickel complexes. **Tamara Sibray** is finishing her primary research project on alkene oligomerization catalytic activity of neutral acceptor "PC" pincer complexes of platinum and presented her research at the Fall National ACS meeting. A paper on this work is being prepared for submission this summer. This past summer we hosted **Obineche Nnebedum** as an REU student. **Obi** came from Kalamazoo College in Michigan and worked with **Brian Gruver's** on new synthetic routes to ruthenium hydrides. **Bhusan Thapaliya**, a second year graduate student, took most of the summer of 2011 off to return to Nepal and marry; he is back in Laramie working on homoleptic fluorinated phosphine chemistry. **Justin Spott** is the newest group member. **Justin** comes from Wilkes University in Pennsylvania, where he worked with former **Roddick** group member **R. Greg Peters**, and is working on palladium-mediated alkene oligomerization chemistry.

## JING ZHOU

**Jing Zhou's** research group is in its 5th year at the UW Chemistry Department. The group currently consists of **Elfrida Ginting**, **Ching-Rong Chung** and **Sakun Duwal**. **Elfrida** is a 2nd-year graduate student and has just successfully completed the prelim defense for her Ph. D. study. **Ching-Rong Chung** and **Sakun Duwal** are Chemistry undergraduate students. The group has been making steady progress in research which focuses on the fundamental understanding of structure-property relationships of metal nanoparticles as well as mixed oxide catalysts for their application in the ethanol reforming. Last summer, the group hosted **James Thorne** for undergraduate research on the growth and characterization of manganese oxide thin films. His research was supported by Wyoming NSF EPSCoR funds. The group presented the research findings at the 2011 Gordon Research Conference-Chemical Reactions at Surfaces as well as the Rocky Mountain American Vacuum Society Meeting. The results were further reported in journal articles submitted to *Surface Science* and *Journal of Physical Chemistry*. This year, the group is happy to announce that the National Science Foundation recommended **Jing** for the CAREER award. This award is the result of the collective efforts of current and past group members.



We look forward to hearing from you.

Please let us know what you are up to

email: [chemistry@uwyo.edu](mailto:chemistry@uwyo.edu)



## CONGRATULATIONS TO OUR CHEMISTRY FACULTY



February 23, 2012 — **Jing Zhou**, a University of Wyoming chemistry assistant professor, was the recent recipient of the National Science Foundation's Faculty Early Career Development (CAREER) Award. It is the eighth time -- and fourth in the department of chemistry -- a UW junior faculty member has received this award.

The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the NSF's most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations. The Chemical Catalysis & Synthesis Program within the NSF's Chemistry Division recommended Zhou for the award.

**Zhou** will receive a portion of her \$506,000 NSF award later this semester to continue her research into the structure and reactivity of oxide-supported metals -- such as gold and nickel -- which serve as catalysts in the energy-production process.

**Zhou** wants to study how such catalysts work in a controlled environment and eventually present the findings to the energy industry for a clean-energy reforming process to create hydrogen.

"Energy sources, such as coal, oil and natural gas, could not meet our future needs. We need to come up with alternative energy that is clean," says **Zhou**, who is in her fifth year of teaching at UW. "I'm looking at hydrogen as an alternative energy source.

"In order to get hydrogen, you need a way to do it. One way to do this is through the steam-reforming process with biomaterials, such as ethanol, over catalysts."

Her research also will include an educational component. A UW graduate assistant will teach and promote the importance of nanoscience knowledge as part of an overall science education in the public schools. A scanning tunneling microscope will be brought into those classrooms and give students an opportunity to visualize the nanoworld of the material, Zhou says.

"This will not only give my students an opportunity to conduct research in the field, but also give them the opportunity to connect the knowledge they learn and be able to interact with undergraduate students and those in the public schools," she says.

In addition, **Zhou** plans to conduct a nanoscience art show at the UW Campus Activities Center and in K-12 classrooms.

"From an energy standpoint, her research is extremely important," says **Edward L. Clennan**, Head of UW's Department of Chemistry. "Her work is fundamental, but with potential real-world applications in the energy industry. She's a very bright young lady."

The CAREER Program is a Foundation-wide activity that offers the NSF's most prestigious award in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the mission of their organizations. Only assistant professors without tenure are eligible. The CAREER Program is intended for faculty members who are at or near the beginning of their careers.

**Zhou** says she is honored to join fellow chemistry colleagues --**Franco Basile** and **Jan Kubelka**-- who previously received NSF CAREER Awards. Geology professors **Mark Clementz** and **Bryan Shuman**; **Gregory Lyng**, a mathematics professor; and **Adrian Feiguin**, an assistant professor of physics and astronomy, are other UW faculty who have previously received the NSF award. Another chemistry professor, selected in the late 1990s, before **Zhou's** arrival at UW, was the chemistry department's first NSF Career Award winner, **Clennan** says.

"I'm excited. It's recognition of my research," **Zhou** says. "This (award) gives me a lot of momentum to move my research program".

◇ Extraordinary Merit for Advising, **Robert Corcoran**

◇ Extraordinary Merit for Research, **Bruce Parkinson**

◇ Extraordinary Merit for Teaching, **Mark Mehn**

◇ A&S Thumbs-up Recipient, **John Hoberg**

◇ SER Graduate Assistantship Award Recipients **Milan Balaz**, "Multiporphyrinic Light-harvesting Nanorays" and **Brian Leonard**, "Metal Carbide Nanomaterials as PEM Fuel Cell Eelectrode Materials"

◇ A&S International Travel Grant Recipient, **Jing Zhou**



## DEPARTMENT OF CHEMISTRY AWARDS

The following students were acknowledged at our  
Annual Undergraduate Awards Luncheon on  
Wednesday, April 18, 2012

Outstanding Freshman Award

**Kyle D. Duffee**  
**Claire J. Korpela**

Outstanding Sophomore Award

**Drew C. Newman**  
**Aaron C. Spurlock**

Outstanding Junior Award

**John M. Stacy**

Outstanding Senior Award

**Carrie L. McCarthy**

CRC Press Freshman Chemistry Achievement Award

**Bhagya W. Gunatilleke**

Undergraduate Inorganic Chemistry Award

**Gregory R. Waetzig**

College of Arts & Sciences Board of Visitors Student Service  
Award

**Gregory R. Waetzig**

Arthur Gray Janssen Award

**Gregory R. Waetzig**

Howard H. Heady Scholarship in Chemistry

**Joshua H. Jones**

R. Owen Asplund Prize for Undergraduate in Chemistry

**Levi A. Hamilton**  
**James E. Thorne**

Rebecca Raulins Undergraduate Research Prize

**Bradley M. Schmidt**  
**Gregory R. Waetzig**

Walter F. and Barry D. Gasdek Scholarship

**James T. Moulton**

Clifford C. Hach Memorial Scholarship

**Jessica F. Hunt**  
**Jencee E. Reardon**

Clifford C. Hach Scientific Foundation  
Chemistry Teacher Scholarship

**Jacob T. Schmied**



Gregory Waetzig receives an award from Department Head, Ed Clennan

## EXTERNAL AWARDS

American Chemical Society E.R. Schierz Scholarship

**Joshua T. McConnell**

American Chemical Society Graduating Senior Award

**Carrie L. McCarthy**

American Chemical Society Entering Freshmen Award

**Aaron B. Cheese**

Nielson Excellence Fellowship in Energy Studies Award

**Carrie L. McCarthy**  
**Jim Thorne**

Congratulations to **Carrie L. McCarthy** College of Arts and Sciences 2012 Outstanding Graduate



## SUPERIOR STUDENT AWARDS

Mohammed M. Al Musabeh  
Ameen A. Alabdulaal  
KariAnna Baber  
Borden W. Ball  
Samuel G. Bartko  
Paul Bonifas  
Paul J. Burke  
Ching-Rong Chung  
Scott L. Coffin  
Christina J. Davison  
Stanley B. DeVore  
Patrick S. Dilsaver  
Frances G. Domenico  
Kyle D. Duffee  
Sakun Duwal  
Michael J. Even  
Katelyn A. Gonterman  
Leslie Ann Graul  
Bhagya W. Gunatilleke  
Levi A. Hamilton

Joshua H. Jones  
Lambert L. Kabwar  
Brianna N. Kilpatrick  
Claire J. Korpela  
Jared L. Krysl  
Alex M. Literati  
Carrie L. McCarthy  
Zoe N. McDonald  
Joshua J. Messer  
Kendra L. Moore  
Jennifer A. Morkemo  
James T. Moulton  
Neil R. Neuberger  
Clark R. Newbold  
Drew C. Newman  
Christopher T. Nordyke  
Amanda M. Olive  
Bryan W. Overcast  
Christopher M. Parton  
Erik W. Peterson

Rachael N. Piver  
Ashlin G. Porter  
Christopher W. Robinson  
Bradley M. Schmidt  
Della C. Simmons  
Robert B. Slipp  
Aaron C. Spurlock  
John M. Stacy  
Mitchell S. Szymczak  
Jordan Thorn  
James E. Thorne  
Gregory R. Waetzig  
Stephanie N. Wakefield  
Mikel L. Walbridge  
John L. Weerstra  
Benjamin G. Wimpenny  
Sarah Wimpenny  
Emily Woodard  
Haonan Zhong



## IN OTHER NEWS

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- § Associate Professor, **Franco Basile**, published “Intermolecular Condensation Products formed During the Pyrolysis of Peptides,” in the *Journal of Applied and Analytical Pyrolysis*.
  - § **Franco Basile** published “Mass Spectrometry Characterization of the Thermal Decomposition/Digestion (TDD) at Cysteine in Peptides and Proteins in the Condensed Phase” in the *Journal of the American Society for Mass Spectrometry*.
  - § **Franco Basile** published a book chapter, “Rapid Sample Preparation for Microorganism Analysis by Mass Spectrometry in Rapid Characterization of Microorganisms by Mass Spectrometry,” in the *American Chemical Society (ACS) Symposium Series*, volume 1065.
  - § Professor **Ed Clennan**, Department Head, served as discussion leader for a session on photo-chemically induced electron transfer at the Physical Organic Gordon conference.
  - § Professor, **Dean Roddick**, and his research group’s research on catalytic hydrocarbon conversion chemistry was selected as the cover highlight for *Organometalics*.
  - § Assistant Professor, **Milan Balaz**, published an article, “Chiroptical Detection of Condensed Nickel(II)-Z-DNA in the Presence of the B-DNA via Porphyrin Exciton Coupled Circular Dichroism,” in *The Journal of Physical Chemistry B*.
  - § Assistant Professor, **Milan Balaz**, published an article, “3,3’-Diethylthiatricarbocyanine Iodide: Helicity and Sequence,” in *International Journal of Molecular Science*.
  - § Assistant Professor, **Mark Mehn**, presented “Developing New Iron and Manganese Oxidation Catalysts” at the American Chemical Society national meeting.
  - § **Mark Mehn** and several collaborators presented a poster, “Synthesis and Characterization of Sterically Encumbered  $\eta$ -Ketoiminate Complexes of Iron(II), and Zinc(II)” at the American Chemistry Society national meeting.
  - § **Mark Mehn** presented a poster, “Bioinspired Oxidation via Iron and Manganese Catalysts,” at the Biological Inorganic Chemistry 15th international conference. Mark also gave a series of talks in Boston last spring.
  - § Professor, **Keith Carron**, is the editor of a special issue of the *International Journal of Spectroscopy*, which will focus on “Raman Spectroscopy: Applications for Defense and Security.”
  - § Assistant Professor, **Brian Leonard**, received the 2011 Donald E. Fox Chemistry Lectureship Award from the University of Nebraska-Kearney. While accepting the award, he gave an invited lecture, “Inorganic Nanomaterials: Synthetic Techniques and Applications.”
  - § Graduate students, **Gevorg Sargsyan** and **Jung Kyu Choi**, (Balaz Group) presented posters at the American Chemical Society national meeting.
  - § Graduate Students, **Tamara Sibray** and **Brian Gruver**, (Roddick Group) presented seminars on catalysis research at the American Chemistry Society national meeting.
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## CONGRATULATIONS TO SHELLEY STRALEY, Chemistry Department Office Manager



Dean Oliver Walter poses with this year’s A&S Staff Service Award winners. **Shelley Straley** (Chemistry), Nicole Wade (Physics & Astronomy), Kris Wold (Art), Beth Buskirk (Math), and Sue Woirhaye (A&S Deans Office).



## ALUMNI NEWS

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- § **Larry Sherman**, Ph.D. 1969, the BSA named their garden in Scranton, “The Dr. Larry Sherman Scout Garden.” Larry also was elected in the wall of fame at Nazareth High School in Nazareth, Pennsylvania. Larry has also published a novel, “To Hide Behind a Wall”.
- § **Desiree Henriksen**, BS 2006, Chemistry, BA 2006, Education, is the new director of the 2012 National Youth Science Camp. Henriksen teaches science at Waynesboro High School in Virginia and has a master’s degree in teaching chemistry from Indiana University.
- § **Abdujwegab Tuwati**, MS 2011, and Ahlam Elrahal welcomed son Fouzi Abdulwehab.
- § **Mary Jean Wilson**, BS 1949, died December 21st, 2011.
- § **Jenna Buffington**, BS 2011 and Eric Milliken, BSCE 2011, married June 11th, 2011. Jenna is pursuing a master’s in Chemistry and Eric is pursuing a master’s in Civil Engineering here at UW.
- § **Eric Kalberer**, Ph. D. 2004, has resigned as senior scientist at the Western Research Institute and moved to the Cleveland, Ohio in February, accepting a position as Director of Product and Market Development at Nuvention Solutions Inc. Eric and his wife Lindsey added a new son, Henry.
- § **Travis Hesterberg**, BS 2006, married Elyse Pearson, September 24th in Dallas.
- § **Shannon White**, Ph.D. 2000, continues to work at Aspen Aerogels as a program manager. Her current projects are with NASA to develop aerogel insulation replacement for multi-layer insulation which is currently used in most cryogenic space applications. She also still works with the Air Force and DARPA to insulate satellites with aerogel insulation. Some of Aspen’s aerogel material was on the last Space Shuttle Endeavour launch, and Shannon got VIP passes for her family to watch the launch.
- § **Chris Schnabel**, Ph.D. 1995, continues as an Assoc. Professor of Chemistry at Eckerd College in St. Petersburg, FL, where his research with undergraduates explores the biologically-relevant coordination chemistry of zinc. Chris has been spending much of his time co-authoring an undergraduate level textbook (Oxford Press) which he hopes to complete this year.
- § **Laura Peitersen**, Ph.D. 1995, and her husband Matt are celebrating their 24th wedding anniversary this fall, and are both research scientists with SAIC, Inc. Their daughter Rhiannon is in her freshman year at Western Washington University in Bellingham, WA. Laura survived a total kitchen and bathroom remodel a couple of years ago.
- § **Richard Merwin**, Ph.D. 1994, has just moved from his previous job with Henkel in Phoenix, Arizona, to Stephan Colorado. Rich was hired to develop insecticides, herbicides and crop protection products.



CHEM 5200

Topics: Analytical Chemistry

Summer 2012, July 18-20\*

“Surface-Enhanced Raman Spectroscopy”

“Biosensing with Plasmoni Nanosensors”

“New Directions in SERS: Pushing the Sensitivity, Space, and Time Limits”

PRESENTED BY Professor RICHARD P. VAN DUYNÉ, Northwest University



Richard P. Van Duyné is the Charles E. and Emma H. Morrison Professor of Chemistry at Northwestern University. He is known for the discovery of surface-enhanced Raman spectroscopy (SERS), the invention of nanosphere lithography (NSL), and development of ultrasensitive nanosensors based on localized surface plasmon resonance (LSPR) spectroscopy. His research interests include all forms of surface-enhanced spectroscopy, plasmonics and nanophotonics, nanoscale chemical/biological sensors, nanosphere lithography (NSL), atomic layer deposition (ALD), atomic force microscopy (AFM), scanning tunneling microscopy (STM), ultra-high vacuum (UHV) STM, UHV-tip-enhanced Raman spectroscopy (UHV-TERS), MALDI-TOF mass spectrometry, and surface-enhanced femtosecond stimulated Raman spectroscopy (SE-FSRS). Professor Van Duyné has been recognized for his accomplishments with several recent honors including the Charles N. Reilly Award, Society for Electroanalytical Chemistry (2011); Election to the US National Academy of Sciences (2010); Award in Analytical Chemistry, American Chemical Society (2010); Bomem-Michelson Award, Coblentz Society (2010); Ellis R. Lippincott Award, Optical Society of America (2008); Professeur invite classe exceptionnelle – University Pierre et Marie Curie, Paris (2008); Special Creativity Award, National Science Foundation (2007); L’Oreal Art and Science of Color Prize (2006); Nobel Laureate Signature Award for Graduate Education, American Chemical Society (2005); Election to the American Academy of Arts and Sciences (2004); and The Earle K. Plyler Prize for Molecular Spectroscopy, American Physical Society (2004). Van Duyné received his B.S. degree from Rensselaer Polytechnic Institute (1967) and a Ph.D. degree in analytical chemistry from the University of North Carolina (1971).

\*Wednesday, July 18th, 10:00-11:40 am

\*Thursday, July 19th, 10:00-11:40 am

\*Friday, July 20th, 10:00-10:50 am

Berry Center Room 138

This is three days only; students may receive 1 credit hour by enrolling in CHEM 5200, CRN 31436

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EFFECTS: Wyoming Natural Gas Prices

By: Ed Clennan

Wyoming natural gas prices are at a 10-year low and are likely to come in well below the projected 2012 price of \$3.25 per million cubic feet (mcf). This creates a significant budgetary problem for the State of Wyoming since natural gas is the state’s major source of revenue. Governor Matt Mead in anticipation of further eroding prices has asked all state agencies, including the University of Wyoming, to prepare for an 8% budget cut. The State of Wyoming has been very generous over the years with the University of Wyoming allowing us to provide a world-class education to our students. I anticipate that the State’s strong support for the University will continue. I also want to thank you, our alumni, for your generosity with gifts to the Department of Chemistry. Please take a look at the list of our foundation accounts on the next page including our two most recently created accounts, the Patrick Sullivan Travel Fund and Frontiers in Physical Chemistry Lecture. Donations from our alumni, especially in tough economic times, help us to do the little bit extra needed to offer an exceptional educational experience to our students.



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Hans Peter Richert Memorial Fund

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Patrick Sullivan Memorial Fund

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