



Colorado State
University



Fall 2009

Department of Chemistry



Inside New Faculty Biographies:

Eric Ferreira

Melissa Reynolds

Letter From The Chair

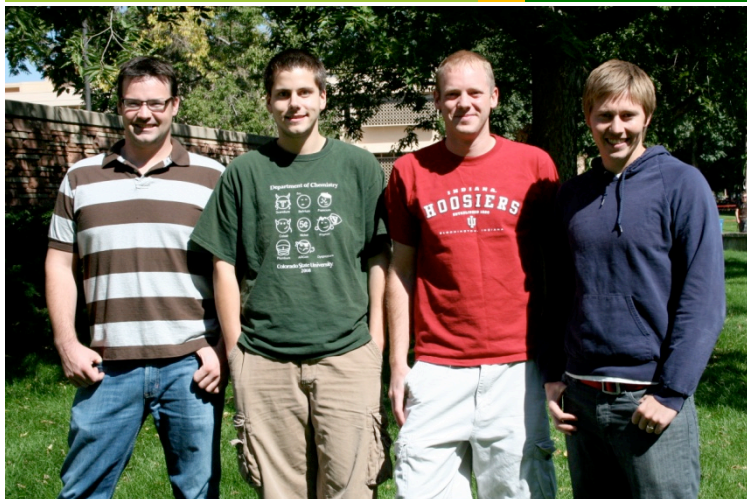
Ellen R. Fisher

Leica e-Beam Lithography Instrument Donation

Graduate Students Awarded Prestigious National Fellowships

Four Chemistry graduate students have been awarded highly coveted and highly competitive graduate fellowships. Second year graduate student Phillip Wheeler was recently awarded the prestigious National Science Foundation Graduate Research Fellowship (NSF-GRF) available only to the most promising graduate students nation-wide. The NSF-GRF is extremely competitive with fewer than 10% of applications across all NSF disciplines being selected for funding. Wheeler will receive a 3-year, \$30,000/year stipend along with a \$10,500/year budget for tuition and educational expenses to pursue his graduate research under the direction of Prof. Tom Rovis. Philip's research project involves the development of new catalyzed acyl transfer reactions. He is currently engaged in attempting to make complex peptides in a greener, and more efficient process. (cont p.2)

Awards in Chemistry



From left to right: Phillip Wheeler, Michael Cuddy, Stephen Lathrop and Derek Dalton

Derek Dalton, also a second year Ph.D. student in the Rovis group, was awarded the Ruth Kirchstein graduate fellowship from the National Institutes of Health (NIH). This fellowship aims to improve the diversity of the health related research workforce by supporting the training of predoctoral students from groups that have traditionally been underrepresented in the sciences. Derek has been actively engaged in the development of a rhodium catalyzed reaction which brings three different components together to assemble a six-membered nitrogen heterocycle in a single step. With this [2+2+2] cycloaddition, Derek is planning to assemble the natural product acosmine, which has a variety of desirable medicinal properties.

Third year Ph.D. student Michael Cuddy was awarded the SMART (Science, Mathematics and Research for Transformatism) fellowship, beginning in August 2009. SMART fellows are funded through the Department of Defense and are required to participate in research at a National Laboratory during their graduate careers as well as after graduation. Mike's research project under the direction of Prof. Ellen Fisher seeks to understand the surface interactions of gas-phase species in fluorocarbon plasmas using both experimental and computational methods. These systems are widely used in the microelectronics industry for etching of semiconductor materials and for deposition of super-hydrophobic surfaces.

Finally, senior graduate student Stephen Lathrop was awarded an ACS Division of Organic Chemistry Graduate Fellowship, sponsored by Sanofi Aventis for the 2009-2010 academic year. In addition to a generous stipend, the fellowship also includes travel expenses to present a poster at the 2011 national Organic Symposium in June 2011. Stephen, under the direction of Prof. Tom Rovis, has recently succeeded in developing a multi-catalytic reaction wherein multiple distinct catalysts act on simple starting materials, making complex poly-substituted products in a stereodefined way. His current efforts are engaged in applying this reaction to the synthesis of the natural product cephalimysin, which has potential antitumor properties.

Congratulations to all four of these outstanding students!

Additional Chemistry Department Kudos

In the past year members of the Chemistry Department have garnered several honors and awards, including the following:

- Prof. **Debbie Crans** was among the inaugural group of ACS Fellows at the Fall 2009 National ACS meeting. Crans was the only chemist from a Colorado University to be named an ACS Fellow this year.
- Prof. **Mike Elliott** was named a Professor Laureate in the College of Natural Sciences at CSU in 2008.
- Recent Ph.D. graduate, **Tenaya Newkirk** was awarded the College of Natural Sciences graduate teaching award in 2009; primarily for her outstanding efforts in teaching CHEM245 during the 2008-2009 academic year.
- Senior chemistry and violin performance double major **Nancy Tao** was awarded the prestigious Jack and June Richardson Honors Scholarship award from the Honors College. This award is given to only four students across the entire university each year.
- Prof. **Ellen Fisher** was named a Professor Laureate in the College of Natural Sciences at CSU in 2009.
- Prof. **John Wood** was honored with the 2009 Alan Katritzky prize from the International Society of Heterocyclic Chemistry, which recognizes members of the heterocyclic community who have made outstanding contributions to the field.

The department welcomes 3 new faculty members this Fall. Here we highlight one of these, Dr. Melissa Reynolds, along with our slightly more senior junior faculty member, Dr. Eric Ferreira, who started CSU in August of 2008. Our Spring newsletter will highlight the other two new faculty; Dr. Ackerson and Dr. McNaughton.

Dr. Eric Ferreira

Dr. Ferreira joined CSU's Chemistry Department in the Fall of 2008, and he has already built a group of four graduate students. His research focuses on the design and development of synthetically useful reactions and their applications in the construction of structurally interesting molecules. Specifically, they are studying the utilization of catalysts based on transition metal complexes to design transformations. By inventing these new reactions, they hope to ultimately facilitate the syntheses of compounds with unique biological properties, such as important pharmaceuticals or natural products.

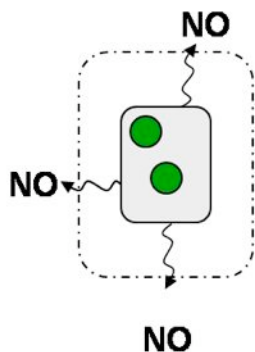
Eric received his bachelor's degree from MIT, where he spent some time doing undergraduate research in the labs of Stephen Buchwald. He pursued his Ph.D. studies as an NSF Graduate Fellow under Brian Stoltz at Caltech working on palladium-catalyzed oxidation chemistry. He then went on to do postdoctoral research as an American Cancer Society Fellow under direction of Barry Trost at Stanford University, where he worked on carbon-carbon bond forming reactions.

In his time at CSU, Eric has been very active on our graduate recruiting



Dr. Melissa Reynolds

Dr. Reynolds received her Ph.D. in chemistry in 2004 from the University of Michigan while working in Dr. Mark E. Meyerhoff's laboratory. Her graduate work focused on developing new methods for synthesizing and characterizing nitric oxide releasing polymeric materials. Following graduate school she directed research for a medical device startup company focused on creating polymeric materials for use as implant coatings. As a result of this work, She was awarded over \$5 million dollars in NIH funding, is an inventor on 2 issued and 8 pending patents, and created a comprehensive IP portfolio through licensing and internal research efforts. In 2008, these endeavors resulted in the formation of a spin-off company supported by venture capitalist firms. Melissa has authored over 25 papers/presentations on nitric oxide materials for improving the biocompatibility of devices. In 2005 she was recognized with a Science Award from the National Institutes of Health for her expertise in nitric oxide research.



In her short time at CSU, Melissa has joined the faculty of the School of Biomedical Engineering, a new multi-disciplinary, cross-college program and is a member of our Faculty Search Committee.



Letter From the Chair

I began writing this column a few weeks ago at Reagan National airport in Washington D.C., awaiting the departure of my return flight to Colorado, having spent the previous few days at the National ACS meeting. The myriad items forming my rapidly expanding “To-Do-Before-Classes-Start” list stared up from the page in front of me. Beginning a new academic year always invokes a range of emotions in me. The perpetual excitement and invigoration from the campus buzzing with students, becomes a sense of loss inevitably permeating my mood as the laid-back ease of summer gives way to feelings of trepidation and nervousness when classes begin. Although eager to get back in the classroom to try out new activities or a rearranged set of lecture notes, I am reluctant to turn away from my group’s latest research results to focus on class preparation.

This year is the same, yet very different for me – being Department Chair brings with it a completely different set of responsibilities for the beginning of an academic year. Although I served as Associate Chair for the past three years, nothing really prepares you for everything the position of Chair entails. Before anything else, I send out a resounding “Thank You!” to Prof Tony Rappé, our immediate past Chair, who continues to be extremely generous with his time, helping me transition into the Chair’s role. Over the past six years, Tony actively advanced the Department’s high quality education and research programs, most notably by hiring six assistant professors and one senior faculty member. He also spearheaded efforts to increase the Department’s participation in clean energy and catalysis research programs. These have reaped huge rewards as multiple faculty members currently hold research grants from the Center for Revolutionary Solar Photoconversion (CRSP) and CSU’s Clean Energy Research Supercluster. As Tony returns to our faculty ranks this fall, he is teaching a section of our freshman-level “Chemistry in Context” course with a new energy-related theme, but will rejuvenate with a well-deserved sabbatical at Los Alamos National Labs during the Spring 2010 semester.

Many new faces appear in the halls of the Chemistry Building these days. In addition to the latest crop of excellent graduate students entering our program from as far away as Thailand and as close as Denver, we also welcome new assistant professors, and new staff members. This past summer marked the 16th straight year of our NSF-funded Research Experiences for Undergraduates (REU) program. The ACS-sponsored International REU program, has allowed us to go global as we have now hosted a total of 3 students from Germany. In other newsworthy areas, the Department recently acquired several new state-of-the-art instruments through a generous donation as well as National Science Foundation and National Institutes of Health instrumentation grants. We plan to use the pages of our (also) new departmental newsletter to feature both people and facilities, highlighting changes and updates to our educational and research programs, our building, and our people.

Similar to my mixed emotions on facing new school years, the enthusiasm and optimism surrounding new faces and research programs in the Department are tempered by the financial difficulties facing the University as the state of Colorado attempts to address budget shortfalls. Thus, as I finish this column (3 weeks into the semester and 4 weeks after starting it), I find I have completed most of the “Before Classes Start” tasks, but my To-Do list has, if anything, grown even longer and perhaps more complicated. Although we face difficult times, I remain optimistic that the Department and the University will continue to thrive as we work to protect our most valuable asset – our students and their education.

Alumni and Friends: Plan to attend our first-ever Alumni Event to be held Sunday, March 21 at the National ACS Meeting in San Francisco. More information will appear in our Spring 2010 Newsletter.



Leica e-Beam Lithography Tool Donated to Chemistry Central Instrument Facility

Colorado State University recently obtained a Leica VB6-HR E-beam lithography system, resulting from a proposal written by Professors Kristen Buchanan (Physics), Carl Patton (Physics), Mingzhong Wu (Physics), and Amy Prieto (Chemistry). The Seagate facility in Pittsburgh, PA donated the tool in exchange for research CSU faculty will do in collaboration with their company. The \$1.2 M instrument, which will be housed in the Chemistry Department's Central Instrument Facility, significantly enhances CSU's nanofabrication capabilities. It will be operated as a user facility to provide students with hands-on experience in electron beam lithography, which is used to reproducibly create nanoscale features and patterns (i.e. under 30 nm) on surfaces, a mainstay of integrated circuit manufacturing and other areas of nanotechnology. Although not up and running yet, the instrument promises to be an asset in competing for new research funding and for recruiting faculty in the areas of nanoscience and quantum computing.



The upper photo shows the instrument up and running at the Seagate facility. Upon arrival, Interim Dean Jan Nenger and CIF Director Chris Rithner were on hand to supervise the e-beam instrument's arrival at CSU (lower photo).

Chemistry at CSU: By the Numbers

The following is a list gives a snapshot of the chemistry department at CSU, by the number of:

Current graduate students.....	139
International graduate students.....	15
Current undergraduate majors.....	140
Female Chemistry majors.....	64
Freshman Chemistry majors (Fall 2009).....	45
Ph.D.'s granted 2008-2009.....	15
M.S. degrees granted 2008-2009.....	9
B.S. degrees granted 2008-2009.....	25
Full time research-active faculty.....	28

Help Us Stay in Touch:

Let us know when you move or get a new email address so that we can stay in touch with our friends and alumni. Update your information by emailing our

College Alumni Office at:

Erica.Nesselroad@colostate.edu



Spring 2009 Chemistry Graduates: Back Row (L to R): Andrew Blimes, Barry Cooper, Kate Gorecki, Frederick Peelor, Daniel Banks, Jennifer DuCray, Lauren Rubenstrunk, Prof. Tony Rappé. Middle Row: George Davies, Chase Girard, Welsey Kramer, Jeff Chory, Aaron Wolfe, Brittelle Bowers, Sarah Collins, Morgan Kohls, Michael Getzy, Prof. Alan Van Orden, Prof. Rick Finke. Front Row: Diana Chang, Amanda Bayless, Carrie Gowen, Jannelle Plasters



Summer 2009 REU Students: Back Row (L to R): Cathy Munson, Michelle Liugscheit, Katti McNally, Laurence Quinn, Prof. Amy Prieto (new REU Director), Casey Andrews, Becky Bayer; Front Row: Jakob Schaab, Ariane Vartanian, Stacie Newton, Sara Mosley, Sheneve Butler.