

NOTES FROM COOK

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Of note

- New undergraduate research opportunity in the department (page 1)
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CHAIR'S MESSAGE

In effort to keep better connected to our community on campus and off, we have initiated this newsletter. It is a complement to continually updated sources such as our Web page and new Twitter feed (www.twitter.com/UVMChemistry) as well as other sources such as the recent highlight on chemistry in the College of Arts and Science newsletter.

The last year brought exciting new developments in the department including new research opportunities for our students, new state-of-the-art instrumentation, and student accomplishments. The research in the Department continues to be top-flight, and key to our successes in research are the graduate and undergraduates who work with our professors as partners in research. This fall there are 40 graduate students in chemistry from diverse backgrounds: Three are from Africa, two from the Middle East, four from China, one from Europe, and four from India. The remainder of the students come from around the United States.



View of Cook Physical Sciences Building from the north.

There is always great activity in the department, and we have highlighted some of those changes herein for you. Beside the new developments in teaching and research, our students and faculty have been recipients of numerous accolades over the last year.

Enjoy some developments about the Department, your friends, and fellow alum and please keep in touch.

-Dwight Matthews

DEPARTMENT NEWS

New research opportunity in the Department

Alumna **Louise Foley** (B.S., '65) established the Martin E. Kuehne Summer Undergraduate Research in Organic Chemistry Award to support students pursuing undergraduate research in synthetic organic chemistry. Upon graduating from UVM, Dr. Foley earned a Ph. D. degree in chemistry from MIT before a distinguished career at Hoffmann-LaRoche as well as engaging in teaching. Dr. Foley's gift began with her recognition of the value of her experience at UVM. She wrote in establishing the fund, "Professor Kuehne selected me to do summer research in his group and thus made it possible for me to discover my love of doing research in organic chemistry." The Department and particularly the first Kuehne Summer Fellowship recipient, **Chelsea DuHaine** (B.S., '09), are very grateful for the generosity Dr. Foley demonstrated in establishing this award and for her support of chemical research at UVM.

Upgrade in research capacity

Through a National Science Foundation Major Research Instrumentation grant award to Profs. Matthews and Petrucci, the Department acquired a state-of-the-art Applied Biosystems 4000QTrap Pro mass spectrometer to upgrade the department facilities and create new research opportunities. This new mass spectrometer has indeed created these opportunities already. In less than nine months of operation, several new publications from the Department have resulted using this new resource. Additionally this year, the Department acquired new routine-use infrared and ultraviolet-visible spectrophotometers.

Record enrollment in chemistry courses

Since 2002, the total enrollment in chemistry courses at UVM has nearly doubled to an all-time high of just over 3600 students in the fall of 2009. Although increasing undergraduate enrollments explain some of the growth seen in chemistry classes, we also attribute the ever increasing quality of the UVM undergraduate with much of this growth. The increased quality of students brings more students to UVM seeking professional careers in the health and related sciences.

National support for student research

Senior chemistry major **Jon Hulce** was one of the first students in the country to receive a newly created ACS Division of Organic Chemistry Summer Undergraduate Research Fellowship. This award was used to support his work with Prof. Paul Krapcho over the summer of 2009.

Research funding

After leading the College of Arts and Sciences in extramural funding in fiscal year 2008, the Department brought more than \$1.2M in additional grant funding in FY2009.

New faces

In 2009, **Bruce O'Rourke** (M.S., '07) started as the manager of the Mass Spectrometry Facility upon acquisition of the new LCMS. Also this year, **Travis Verret** took over the second-floor stockroom. Welcome to both new members of the Department.

UNDERGRADUATE DEGRRES 2009

Andrew Crampton Jr.	B.S., Chemistry	Oliver Pentenrieder	B.S., Chemistry
Timothy Boyd	B.A., Chemistry	Jessica Scherer	B.A., Chemistry
Jillian Davidson	B.S., Chemistry	Jonathan Tinkham	B.S., Chemistry
Chelsea DuHaime	B.S., Chemistry	Joseph Wright	B.S., Chemistry
Stephen Haley	B.S., Chemistry	Christopher Ziegler	B.A., Chemistry
Julie Kwok	B.A., Chemistry		

AWARDS

Student Awards*University-wide*

Jillian Davidson ◦Mariafranca Morselli Leadership Award

Joseph Wright ◦Hannah Howard Prize

*Departmental*Fourth-year Awards

Joseph Wright ◦American Institute of Chemists Award

Andrew Crampton Jr. ◦Charles E. Braun Award

Third-year Awards

Jonathan Hulce ◦Merck Index Award

L. Taylor Elrod ◦Clinton D. Cook Award

Second-year Award

Douglas Fox ◦Donald C. Gregg Award

First-year Award

Samantha Ogilvie ◦Chemical Rubber Company (CRC) Award

Faculty Awards

Matthias Brewer ◦2009 Thieme Journal Award

William Geiger ◦Elected to Vermont Academy of Sciences and Engineering

◦2009 College of Arts and Sciences Dean's Lecture Award

Willem Leenstra ◦E. Ann Nalley Award from the ACS Northeast Region

Rory Waterman ◦Research Fellow, Alfred P. Sloan Foundation
◦Cottrell Scholar, Research Corporation for Science Advancement

Alexander Wurthmann ◦2009 Kroepsch-Maurice Excellence in Teaching Award

RESEARCH GROUP NOTES

Matthias Brewer

The Brewer group gained a few new graduate students recently with **Zhe Zhang** and **Dan Bercovici** both joining us during the fall semester. These new additions come just in time to fill the voids left by **Cristian Draghici** (Ph.D. '09) and **M. Irfan Javed** (Ph.D. '09) who both graduated during the spring. Cristian is now doing postdoctoral work with Jón T. Njarðarson at Cornell, while **Irfan**, who apparently can't get enough of the cold, has moved on to postdoctoral studies with Philip S. Portoghese at the University of Minnesota. **Jodi Wyman** and **Nezar Al Bataineh** continue to probe the formation and reactivity of diazenium salts, and Jodi reported some of her results at the 2009 National Organic Symposium as well as in a recent *Organic Letters* manuscript. **Ali Bayir** has been broadening the scope of our novel ring fragmentation methodology and congratulations are due to Ali and Cristian whose work in this area was recently published as a Featured Article in *The Journal of Organic Chemistry*. Dr. **Qiufeng Huang** will soon finish his postdoctoral stint in our group and return to China to interview for faculty positions. Undergraduate students **Bradley Parker**, **Gordana Vukmirovic**, and **Dan Cooney** are all new to the team this semester, while **Spencer Scholz** and **Thomas Ford-Hutchinson** returned and continue to push their projects forward.

William Geiger

Research continues with Ph.D. students **Michael Stewart**, **Kan Wu**, and **Will Barker**. A Project SEED student from Burlington High School, **Blake Ingram**, worked in the group during the summer of 2009. **Derek Laws** (Ph.D., '08) finished up a postdoctoral year at the University of Texas at Austin with Richard Crooks and accepted a position at Siemens. After spending a year at Dow-Corning research, former postdoctoral associate **Daesung Chong** has accepted a tenure track position at Ball State University. **Michael Stoll** (Ph.D., '00) moved to Sandia National Laboratory from Los Alamos. **Ayman Nafady** (Ph.D., '04) continues his electrochemistry research in Australia with Alan Bond. **Tom Gennett** (Ph.D., '83) has moved to the National Renewable Energy Lab in Colorado.

Christopher Landry

The group welcomes two new graduate students, **Alden Clemments** and **Brendon Miller**, both of whom will work on enzyme encapsulation and release in porous materials, a project begun by **Stephanie Livingston** (Ph.D., '09), who is currently a visiting instructor at Roanoke College. **Will Davidson** is completing an M.S. degree, as is **Rahul Patel** as he begins a new job in Ohio. Undergraduate biochem major **Doug Fox** won the top award for organic chemistry, continues research on creating polymeric beads, and hopes to attend the REU program at UCSF this summer. Postdoc **Jeremy Steinbacher** continues collaborative research with the UVM medical school as a fellow on the environmental pathology training grant. Jeremy presented his work at the Inorganic Chemistry Gordon Conference and fall Materials Research Society meeting and attended the first Chemical Communication Leadership Institute in Seattle, sharing his insights in a lecture and workshop at UVM. Last semester his poster won first prize at the Vermont Cancer Center conference. Recent graduates include **Sean Solberg** (Ph.D., '08) who is at Chevron; **Terry Nassivera** (Ph.D., '06) at J. M. Huber, Inc.; and **Adam Sorensen** (Ph.D., '07), who recently moved to Mylan Laboratories facility in West Virginia.

Willem Leenstra

Undergraduate research student **Ross Grimshaw** is applying his

expertise in math (his minor) to a statistical problem in pendant-group distributions in the interlayer region of zirconium phosphonates. Two former students have made recent strides forward in their academic careers: **Jay Amicangelo** (Ph.D., '99) received tenure at Penn State, Erie a year ago, and is now spending a sabbatical semester in Taiwan. **Thomas Castonguay** (Ph.D., '04) just started a tenure-track position as Assistant Professor at Iona College in the fall of 2009.

Dwight Matthews

The Matthews' group welcomed two new members for fall 2009: **Edward Gakpe** from Ghana and **Pushwinder Kaur** from India. Eddie and Pushwinder join **Praveena Nukareddy** Several people also have left in the last two years: **Yue Luo** completed her M.S. degree and is now working at Dartmouth College while her husband completes his Ph.D. **Michael Previs** completed his Ph.D. in Cell and Molecular Biology this fall 2009 and is now a postdoctoral fellow at UVM in the Department of Molecular Physiology and Biophysics. Dr. **Lars Holm** completed his postdoctoral stay in the group in July 2009 and has returned to the Institute of Sports Medicine, Bispebjerg Hospital, Copenhagen, Denmark where he is gaining a junior faculty position. **Zhaoyan Wang**, Ph.D., completed her postdoctoral stay in the group in January 2010 and has returned to China with her husband where he has a faculty position. **Mark Jennings**, (PhD '06) continues working on proteomics project as a Research Associate in Medicine in the group. **Bruce O'Rourke** (MS '07) has now taken a position in the Department as the Mass Spectrometry Facility manager.

Rory Waterman

The Waterman Group continues to grow with two new graduate students, **Karla Erickson** and **James Moten**, as well as two postdocs, Drs. **Dave Newsham** (Penn State) and **Tony Wetherby** (Oklahoma State), in 2009. Undergraduate group alumni **Jill Davidson** (TAMU), **Kyle Donovan** (Westward Pharm.), **Mellisa Ly** (RPI), **James Vance** (U Bristol), and **Joe Wright** (UVM) are working hard and doing well. Former high school researchers are also in good stead. Two former students **Amsal Karic** (SEED) and **Cali Cornacchi** (Essex WIS) started this fall at U Rochester and Wesleyan of Ohio, respectively, and **Stephanie Chan** (SEED) won a Fassbinder Scholarship as student at Dartmouth College. Current graduate student **Vikki Carhart** works on a joint project with Team Landry. Our group is spreading work of our science far and wide. **Andy Roering** and **Jill Davidson** presented at the spring ACS national meeting in 2009, and **Mike Ghebream** presented at the Northeast regional NOBCCHE meeting in October. Our article in *Dalton Transactions* was one of the top-ten most cited articles for 2009, and with students looking toward graduating in 2009, there will be a number of new publications in 2010.

Stephen Waters

The Waters Group welcomed first-year graduate student **Natalie Machamer** (Juniata College) into our laboratory in 2009. The group had a productive year as our natural products program flourished with **Joe Panarese's** synthesis of Aspergillide C and **Xiayun Cheng's** concise total syntheses of three (!) complex alkaloids. Their publications in *Organic Letters* were the #2 and #14 most read articles for their respective months. **Mike McCormack** received the senior graduate teaching award and **Chelsea DuHaim** received the inaugural Martin E. Kuehne Summer Undergraduate Research in Organic Chemistry Award. The group looks forward to a strong showing at the ACS national meeting in Boston this fall.

GRADUATE DEGREES 2009

Student	Degree	Thesis or dissertation title (advisor)
Cristian Draghici	Ph.D.	<i>Discovery of a Novel Ring Fragmentation Reaction; Efficient Preparation of Tethered Aldehyde Ynoates and N-Containing Heterocycles; Radical Addition Approach to Asymmetric Amine Synthesis</i> (Brewer)
Muhammad Irfan Javed	Ph.D.	<i>Studies on the Reaction of Sulfonium Salts with Hydrazones: Synthetic Methods for the Preparation of Diazo Compounds, Alpha-Chloroazo Compounds and Fused of Bridged Bicyclic Diazenium Salts</i> (Brewer)
Andrew Korich	Ph.D.	<i>Phenylene Ethynylene and Phenylene Imine Macrocycles as Precursors for Organic Nanotubes</i> (Hughes)
Derek Laws	Ph.D.	<i>Organometallic Electrochemistry: A Study of Diazonium-Based Surface Attachments and the Anodic Chemistry of Piano-Stool Complexes</i> (Geiger)
Yue Luo	M.S.	<i>Development And Validation of Gas Chromatography- Pyrolysis - Isotope Ratio Mass Spectrometry in Deuterium-Labeled Tracer Study for Protein Metabolism</i> (Matthews)
Stephanie Livingston	Ph.D.	<i>Synthesis, Characterization, and Application of Catalysts Supported on Mesoporous Silica for the Degradation of Chemical Warfare Agent Analogues</i> (Landry)
Nathan Mahany	M.S.	<i>Design of Multifunctional Magnetic Silica Nanoparticles with Polymer Induced Biocompatibility for Biomedical Applications</i> (Waterman and Landry)
Lacey Marina Paradee	M.S.	<i>An Electrochemical Switching Approach to Cr(arene)(CO)₃ Substitution Reactions</i> (Geiger)
Michael Previs	Ph.D.	<i>Quantification of Cardiac Thin Filament Phosphorylation by Liquid Chromatography Mass Spectrometry</i> (Matthews in Cell & Molecular Biology)
Jeffrey Rawson	M.S.	<i>Synthesis of a Soluble, Highly Substituted Pentacene</i> (Hughes)
Sean Solberg	Ph.D.	<i>Synthesis and Characterization of Mesoporous Materials and Their Application in Catalysis and Adsorption</i> (Landry)
James Zahardis	Ph.D.	<i>Photoelectron Resonance Capture Ionization Aerosol Mass Spectrometry of Organic Particulate Matter</i> (Petrucci)

ALUMNI NEWS

Paul Anderson (BS, '59) was named a Burack President's Distinguished Lecturer for 2010. The Department looks forward to the visit in February from one of our distinguished alumni.

Kai Cheng (Ph.D., '07) is completing a post-doc at Brown University and applying for industrial jobs.

Karl Gallis (Ph.D., '01) is the proud father of **Matthew Gallis**, born in September.

Michael MacCoss (PhD '01) was promoted to Associate Professor of Genome Sciences with tenure at the University of Washington (proteome.gs.washington.edu), and in 2008, he received a prestigious NIH Presidential Early Career Award for Scientists and Engineers (PECASE).

Michael's younger sister, **Rachel MacCoss**, who performed research as an undergraduate (BS '01), first completed a Ph.D. in organic chemistry from Trinity College, Cambridge University, with Prof. Steven Ley then was a postdoctoral fellow in Chemistry at Princeton University with Prof. Erik Sorensen before taking her current position as a research scientist at the Merck Research Laboratories in Boston.

Dena Marrinucci, who also performed research as an undergraduate in the Matthews group (BS '04) just completed her Ph.D. from the

Scripps Research Institute in 2009. Dena is continuing on at Scripps as a Project Manager in the Physical Sciences Oncology Center.

Adam Sorensen (Ph.D., 2007) continues to work for Mylan Laboratories and has moved to their new facility in West Virginia.

Next steps

Jill Davidson (BS, '09) is in the Ph. D. program at Texas A&M University working with Prof. Oleg Ozerov.

Stephen Haley (BS, '09) has started graduate study in chemistry at the University of California, Santa Barbara.

Recent undergrad **Jon Tinkham** (BS, '09) is completing his first year at UMass Amherst.

Staying close to home, **Joe Wright** (BS, '09) is working on a M. A. in Teaching at UVM's College of Education and Social Services.

A number of our current seniors are currently entertaining offers of admission from graduate schools including Harvard, Indiana, Iowa State, Emory, Scripps, and Berkeley. We look forward to seeing what choices our future alumni will make.