Chemistry at Hamilton

A newsletter produced by the Department of Chemistry at Hamilton College

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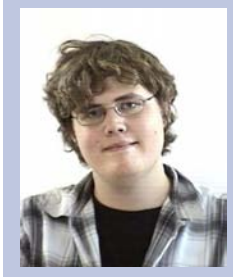
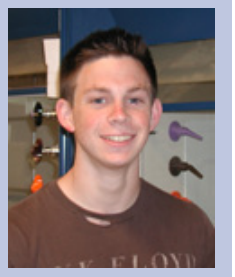
December 2011



Phill Milner



Connor Brown

Phill Milner, chemistry major, 2010 salutatorian and NSF winner. Connor Brown, '12, wins Goldwater. *See Page 9 for story.*

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Hamilton

INTRODUCTION

It has been two and a half years since I last took electron to screen to create the March 2009 chemistry departmental newsletter, and that intervening time has been filled with excitement, change, and great students. The major excitement for both the Department and the College came as a result of a sixteen million dollar donation from Edward C. and Virginia C. Taylor to the College for scholarship aid, faculty research in science and support for new art facilities. In honor of the Taylors, the Science Center is now the Edward C. and Virginia C. Taylor Science Center, or TSC for short. Ted Taylor started college at Hamilton in the mid 1940's intending to be an English major, but discovered a passion for chemistry, exhausted the College's chemistry offerings, and transferred to Cornell for his last two years. He continued on to graduate school at Cornell, and in 1954 Taylor became a faculty member at Princeton actively pursuing research in heterocyclic chemistry. His interest in purine chemistry led to his discovery of and anticancer drug, Alimta, which is now marketed by Eli Lily. Ted has been a passionate supporter of Hamilton chemistry, culminating in this wonderful gift to the College.

Our productivity in terms of students continues to be excellent. In the classes of 2009, 2010 and 2011 we have graduated a total of forty-five Chemistry majors, sixteen Biochemistry and Molecular Biology majors and two Chemical Physics majors. The class of 2012 is similarly strong with a total of twenty-three majors in Chemistry and Biochemistry/Molecular Biology. The students continue to excel, hauling in several Goldwater scholarships and NSF Graduate Fellowships.

With Karen Brewer in the Dean of Students office since July 2008, we have had replacement faculty for the past three years, whom you can read about in the new faculty section. With Ian Rosenstein on leave in the fall of 2009 and Nicole Snyder on leave in 2010-2011, we also had a leave replacement, Josh Ruppel, who has since moved on to a tenure track job in South Carolina—more about him in the "Where are they Now" section.

Chemistry hasn't been all work and no play. The summer students, those at Hamilton and those with Nicole in Germany (see her faculty update) have taken the opportunity to do some fun things together. Last summer, for example, the students attended a Syracuse Chiefs baseball game-and were recognized on the scoreboard (see iPhone photo on p. 10). The Department continues to be a place where students, faculty and staff work together to learn and do chemistry in a supportive and convivial atmosphere.

Robin B. Kinnel, Silas D. Childs Professor, Emeritus
Editor, *pro tem*

FROM THE CHEMISTRY DEPARTMENT CHAIR

The first floor of the Science Center, now the Taylor Science Center, has been an exciting place over the past few years. Enrollments in Chemistry courses have been rising steadily, creating staffing challenges but giving us opportunities to work with more talented students. As you can see from the reports that follow in this newsletter, the accomplishments of our students are impressive, a testament to their hard work and dedication. It is a pleasure to get to work with such an amazing group of students year in and year out.

Equally impressive is the range and quality of the work being done by my colleagues in the department. The core members of the department continue to pursue their research and teaching duties with enthusiasm and we have been blessed with a number of visiting faculty who have worked hard and been successful in their short stays with us. I hope you enjoy reading about all that is happening in the department and please send us your own news if you have a chance!

Ian Rosenstein
Chair, Department of Chemistry

FACULTY UPDATE

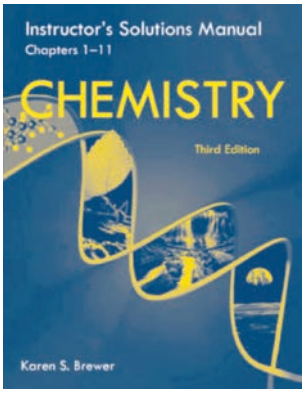
Karen Brewer

Karen Brewer is completing her fourth year as Associate Dean of Students for Academics. As part of her responsibilities in the Dean of Students Office, located in the Elihu Root House, she meets with students encountering academic difficulties and works with the Honor Court Chair to administer the honor code. She chairs the Committee on Academic Standing, which administers the academic regulations of the College and sits *ex officio* on the Committee on Athletics and the Committee on Academic Policy.

While serving in the administration, Karen has continued to teach one course in the chemistry department, either Inorganic and Materials Chemistry 265 or Principles of Chemistry 120, and to supervise senior project students (Sara Miller '12, Elena Wood '11, Peter Kosgei '11, Matt Breen '11, Ariel Kaplan '10, James Langan '10) as well as summer research students. Most of these students have investigated the synthesis of chelated rare earth ions and their incorporation into silica-base sol-gel materials. Variants of the projects have included the synthesis and spectroscopic study of fluorescent rare earth-doped germania glasses and the study of nanoclays as constituents in cosmetics. Karen also continues to teach in the summer HEOP program and welcomes area elementary school groups and Citizen School groups to Hamilton College for "science day" demonstrations.

When her term as Associate Dean of Students is completed at the end of this academic year, Karen will pursue a year's sabbatical leave. She plans on exploring writing a textbook for inorganic chemistry and working on her courses (Principles of Chemistry, Inorganic and Materials Chemistry, Advanced Inorganic Chemistry, and Research Methods in Chemistry).

She has served on two outside review teams for chemistry departments at other colleges, and has authored the second and third editions of the instructor and student solution manuals for *Chemistry: The Science in Context* by Gilbert, Kirss, Foster, and Davies published by W. W. Norton and Company.



Karen is also looking forward to sending Simon (17) off to college next year, while watching Noah (15) accelerate in math in high school and third grader Caleb (8) enjoy reading and all things Egyptian. She has begun taking piano lessons again and is currently working on a piece by Brahms, aiming eventually for a Beethoven sonata.

For the more recent graduates, she continues to sponsor "beer club" gatherings at her home on Griffin Road. This semester's first one is planned for early December and will celebrate the holidays with a Yankee Swap accompanied by plenty of food and great fun for both students and faculty.

Myriam Cotten

Since joining the Department in 2008, Associate Professor of Chemistry Myriam Cotten has been extremely busy. In addition to teaching a Fall section of Chemistry 120 (General Chemistry) from 2008-2010, and Chemistry 270 (Biochemistry) in Spring 2009 and 2011, Cotten has developed and taught a new course, Chemistry 320 (Biophysical Chemistry) in the spring semesters of 2010 and 2011. She has supervised lab sections of Chemistry 125 (Principles of Chemistry) and Chemistry 270. In 2010, she used a Class of 1966 Career Development Award to implement changes in Chemistry 120, which included a Biomimicry assignment as an integrative exercise. In July, 2010 Cotten began a three year term as Director of the Biochemistry and Molecular Biology (BMB) Program. Cotten's research group is large and growing, and has been funded largely by a $525,000 National Science Foundation Faculty Early Career Development (CAREER) award. Their research focuses primarily on piscidins, host-defense peptides found in the mast cells of hybrid striped sea bass, using NMR spectroscopy to investigate the molecular structures of the peptides. The overarching aim of Cotten's research is to demonstrate how structural and functional principles obtained from the study of host-defense peptides can be applied to the development of more effective anti-bacterial therapeutics, using the research to engage undergraduate students in the excitement of learning.

Deacon Lile '09, and Nedzada Smajic '10 completed their senior thesis work in Cotten's lab in 2009-2010. During 2010-2011, seniors engaged in Senior Projects included William (Billy) Wieczorek, Matthew (Matt) Baxter, Daryl Berke, and Nathan (Nate) Schneck. Billy, Matt, and Daryl worked on aspects of the piscidin project while Nate investigated neuropeptide Y, a fascinating antimicrobial neurotransmitter. In March 2011, Billy, Daryl, Matt, Nate and Alexander (Alex) Dao '12 and Jason McGavin '12 presented four posters at the 2011 Biophysical Society Meeting in Baltimore, MD. Billy, Jason, and Matt also presented two posters at the 2010 Biophysical Society meeting in San Francisco, CA, based on research they had conducted in Cotten's lab during the summer of 2009. In

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the summer of 2010, five Hamilton students: Matt, Jason, Alex, Caitlin Burzynski '12, and Nina Kraus '13 worked with Cotten. Matt and Caitlin investigated the charge-state of piscidins 1 and 3 as it relates to the attractive forces between the peptides and microbial membranes. Alex successfully initiated a new study of pisdicin in the presence of lipids that mimic *E. Coli* bacteria, which are killed more effectively by piscidin 1 than piscidin 3. Nina spearheaded studies to optimize the binding of piscidin to DNA. Nina was excited about the project because antimicrobial peptides have been shown to deliver genes inside cells and could therefore be used for gene therapy. Jason performed dye-leakage experiments to test the activity of piscidin on liposomes of varying lipid compositions. Alex, Caitlin, Nina and Cotten spent twelve days at the National High Magnetic Field Laboratory (NHMFL) at Florida State University performing NMR experiments. Jason and Matt went to the University of California San Diego for ten days to learn new sample preparation methods from Prof. Stanley Opella's group, leaders in the field of investigating membrane-bound species under physiologically-relevant conditions using "bicelles," which mimic the lipid membranes surrounding bacterial cells. During these trips, students learned how to set up basic experiments on state-of-the-art instrumentation, and then obtained some outstanding results and data.

In 2009, Cotten published a paper in the *Journal of the American Chemical Society* (131: 10830-10831), and in 2010, she had an invited manuscript published (*Biochim. Biophys. Acta,* 2010, 1798:228). Prof. Eduard Chekmenev (Vanderbilt University) and Dr. Riqiang Fu (NHMFL) collaborated on the BBA and JACS papers. The BBA paper features the first direct evidence that piscidin bound to lipid bilayers interacts with the aqueous environment and provides experimental data to support the idea that the fast motions of piscidin may be a feature shared by antimicrobial peptides to help them kill bacteria within minutes. Cotten also co-authored a paper with Opella and Dr. Anna De Angelis of University of California – San Diego, with Matt and Jason as co-authors. Cotten is also a co-author on an article entitled "Modeling the Membrane Environment for Membrane Proteins" published in the *Biophysical Journal* in May 2011. Cotten gave a research talk at the 2011 Upstate NY NMR Symposium in November 2011.

Tim Elgren

Tim Elgren and his students continue to encapsulate enzymes in their effort to create new functional bio-materials. Two patents have been filed on these novel materials. Their most recent paper describes coupling a photoactive ruthenium complex to the surface of hydrogenase. Photoreduction facilitated by the Ru-complex provides the electrons used for hydrogen production catalyzed by the enzyme (*J. Inorg. Biochem.,* 2012).

His research has expanded to include a number of analytical toxicology projects. These projects are natural extensions of student-initiated projects that have originated from the Chem 125 course. They include investigations of leaching of bisphenol-A (BPA) from various sources. BPA is an endocrine disruptor that can serve as a hormone mimic. Primary exposure comes from polycarbonates (recycling code no. 7) and the resin that lines aluminum cans. One of the interesting projects found, not surprisingly, that there were high levels of BPA in beer taken from cans. (Also not surprising that this would appear as a first-year college student lab project!) A reasonable control sample was to measure BPA in bottled beer. To their surprise, they found more BPA in the bottled beer than in the canned beer. Further investigation established that the BPA originates from the resin on the inside of the bottle cap. Students have quantified BPA leaching into soda and toothpaste and from thermal paper used as cash register receipts. Other students have focused on assessing exposure to toxic metal through contact with pressure treated wood and carcinogenic halogenated flame retardants through contact with dust originating from furniture foam and carpet backing. The Chem 125 lab has evolved into an exciting venture into human and environmental toxicology. The lab was developed in collaboration with Prof. Myriam Cotten, Chuck Borton and Greg Rahn, and adopted in 2010 by Science Education for New Civic Engagements and Responsibilities (SENCER) as a model course (http://serc.carleton.edu/sencer/assessing_exposure_toxic/index.html).

Camille Jones

During the 2009-10 and 2010-11 academic years, Camille Jones taught general and physical chemistry and continued her research on clathrate hydrates, serving as senior thesis advisor to Tom Nevers and Sarah Cryer, both of the Class of 2010. She began the development of a solid-state chemistry course with a $200,000 grant from an NSF award titled "Development of an Undergraduate Course in Solid State Chemistry," with co-PI Tabbetha Dobbins, a physicist at Rowan University. Summers were as active as ever. Joining the Jones Hydrates Research Group to explore a variety of aspects of hydrate structure and bonding were Emina Memisevic '12, Melissa Nezamzadeh '11, Lisa Olszewski '11, and Kristen Pallen '12 in 2009, and Kristen, Aaron Danilack '13, Lennox Chitsike '13, and Pauline Wafula '13 in 2010. High School students also took part in hydrates research; participants were Tyriek Burgess (2009), Adam Schultz (2010), and Tasha Davis (2010) from Thomas R. Proctor H. S. in Utica, NY. Summers ended with excursions to New York City, where the group visited

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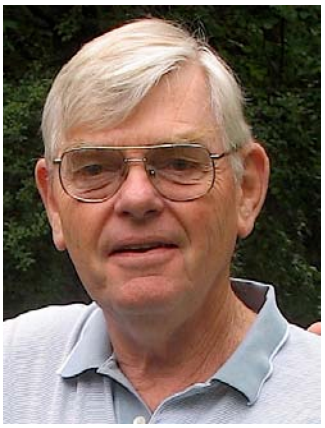
the research group of Jae Lee, a collaborator at The City College of New York (CCNY) and explored midtown Manhattan.

The new CHEM 298 Chemistry Research independent study course offered new avenues for student-faculty collaboration. Participants in research conducted during the semesters were Melissa Nezamzadeh '11 (Fall 2010), Kristen, Daniel Feinberg '13, and Lennox (Spring 2010), and Elizabeth Costello '13, Melissa, and Lennox (Spring 2011). Camille gave seminars at Union College in October of 2010 and Bucknell University in April of 2011.

She also served as co-chair for the *Telluride Workshop on the Microscopic Description of Clathrate Hydrates* in July of 2010. Three works were published: "Temperature-dependent distortions of the host structure of propylene oxide clathrate hydrate." published with Tom Nevers '10 in *Journal of Physical Chemistry C.* A second paper, "Isotope Effect on Eutectic and Hydrate Melting Temperatures," was published in *Journal of Thermodynamics* with coauthors Jae Lee and Junshe Zhang of CCNY. Finally, "Synthesis of Three Selectively Deuterated Propylene Oxides" was published in *Journal of Labelled Compounds and Radiopharmaceuticals* with Kate Otley '12, Ben Saccomano '09, Silas McKee '07, Greg Nizialek '08, Dave Hamilton '09, Leighanne Sherrow '11, and Ian Rosenstein, who supervised the syntheses of these special hydrate guest molecules.



Robin Kinnel

Following a wonderful retirement celebration in May 2009, Kinnel took on Keith Willner, '11, and Nate Taylor, '11, for research during the summer. Keith made good progress with the synthesis of (+)-germacrene-D, while Nate embarked on a new project involving the synthesis of some peptidomimetic compounds related to the peptides from alphafetoprotein.

In the fall, Kinnel taught the Natural and Cultural Histories of the Adirondacks course, which incorporated a glorious weekend exploring old growth forests, John Brown's cabin, a trip to the top of Whiteface and another to the Wild Museum in Tupper Lake. The highlight of the weekend was an overnight stay at Camp Wenonah, a restored Great Camp owned by Jim Schoff, '68; the evening included a seminar on a legal case involving land owner's rights conducted by Schoff's long-time friend Dennis Phillips. He taught the course again in the fall of 2011, this time as professor emeritus, which became official on July 1, 2010.

In the spring of 2010, Kinnel took a five-month sabbatical at Scripps Institution of Oceanography, working in the labs of William Gerwick, who has been working with cyanobacteria, also known as blue-green algae, for more than a decade. Kinnel became involved in a project that aimed to establish a different protocol for discovering natural products derived from cyanobacteria. The organisms are cultured in ^{15}N sodium nitrate, and then are examined by MALDI mass spectrometry to look for compounds that have incorporated the heavy nitrogen. Subtracting peaks for known metabolites reveals the presence of hitherto unknown ones. By using this technique, Kinnel discovered three new compounds from two different strains of algae and established their structures. He reported on one of the compounds, cryptomaldamide, in a talk given at the 2010 International Chemical Congress of Pacific Basin Societies in Honolulu in December 2010.

Upon return to Hamilton in early July 2010, Kinnel was joined at Hamilton by Marta Kolodziejczak, a student from Paris, under the auspices of the Junior Year in France Program. Marta worked on a synthesis of cryptomaldamide, and her efforts were extended in the spring of 2011 by Alexander Thompson, '13. For the summer of 2011, Miles Blackburn, '13, and Aaron Danilack, '13, joined the Kinnel group to work on the syntheses of the other two metabolites isolated, called di- and trichlorobouillonamide. Kinnel reported on these compounds in a poster at the national meeting of the American Society of Pharmacognosy in San Diego in August 2011. Todd Woodworth, '12, is continuing the synthetic efforts toward the chlorinated bouillonamides for his Senior Project during 2011-12. Earlier this fall Hamilton hosted the annual meeting of MAALACT, the Middle Atlantic Association of Liberal Arts College Teachers. As president of the organization, Kinnel, together with Professor Karen Brewer, organized the meeting, whose highlight was a splendid plenary lecture by Terry Collins, a green chemistry proponent from Carnegie Mellon University.

Ian Rosenstein

Ian Rosenstein enjoyed a sabbatical leave for the 2009-10 academic year. During his time away from teaching, he focused his efforts on writing an invited chapter entitled "Radical Allylation and Vinylation Reactions Using Tin Reagents" for the monograph series *Organic Reactions*. Despite completing a major portion of the manuscript during his sabbatical year, this massive project is still a work in progress. He hopes to submit a completed draft by the end of 2011.

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During his sabbatical, Rosenstein worked with two senior thesis students, Alexandra Isaacs ’10 and Phillip Milner ‘10. Alex explored potential synthetic applications of an unexpected esterification reaction that was encountered in attempts to cyclopropanate alkenoic acids under Simmons-Smith conditions while Milner focused on developing methods to control stereochemistry in radical cascade reactions involving conversion of bicyclic vinylcyclopropanes to vinylcyclopentanes. Both Alex and Phill presented their results at the American Chemical Society National Meeting in San Francisco in March 2010.

Kate Otley ’12 and Cara Vennari ’12 joined the Rosenstein lab for the summer of 2010. Cara continued Phill’s work on the radical cascade project while Kate picked up an unrelated project that had progressed but had not quite been finished by previous students. The goal of this project was to synthesize three different selectively deuterated versions of propylene oxide. The project was carried out in collaboration with Prof. Jones, who will use the products to study the dynamics of propylene oxide in a clathrate hydrate cage. Kate successfully completed the third synthesis and the results of this were published in the spring in the *Journal of Labelled Compounds and Radiopharmaceuticals*. In addition to Otley and Prof. Jones, co-authors include Ben Saccamano ’10, Silas McKee ’07, Greg Nizialek ’08, Dave Hamilton ’09 and Leighanne Sherrow ’11.

During the 2010-11 academic year, four seniors did their theses in the Rosenstein lab. Keith Willner examined the use of Oppolzer’s camphorsultam as a chiral auxiliary for controlling the stereochemistry of cyclopropanation reactions, while Lydia Rono investigated a variation on the radical cascade reactions that involves an endocyclic ring opening process of bicyclic cyclopropylcarbinyl radicals. Leighanne Sherrow and Kathy Lee each took a different approach to the study of the effects of the electronic nature of substituents on the rate of the cyclopropylcarbinyl radical ring opening reaction, ultimately taking advantage of a Hammett plot to characterize the influence of substituents.

Nicole Snyder

Since our last newsletter, Assistant Professor Nicole Snyder, now in her fifth year, has been busy building her research program at Hamilton. In the summer of 2009 she worked with ten Hamilton students (Graham B. Hone ’10, Sara G. Miller ’10, Taylor P. Adams ’11, Peter F. Garrett ’11, Kevin W. Graepel ’11, Rem V. Myers ’11, Christopher J. Boisvert ’12, Rachel F. Rothbarth ’12, and Max Yelbi ’12) on several projects focused on the central theme of carbohydrates. Two of those students, Taylor P. Adams ‘11 and Kevin W. Graepel ‘11, were nominated for Goldwater scholarships based on their research on porphyrin-carbohydrate and phthalocyanine-carbohydrate conjugates, respectively, as well as their strong academic records. Adams was selected as a 2010 Goldwater Scholar, and Graepel was awarded Honorable Mention.

In the spring of 2010, Snyder received a grant from the Research Corporation titled, “The Synthesis and Evaluation of Carbohydrate-Porphyrin Conjugates as Asymmetric Catalysts.” Snyder’s work on carbohydrate-porphyrin conjugates is part of a collaboration with X. Peter Zhang’s group at the University of South Florida, which has resulted so far in a manuscript in *Organic Letters* (**2009**, *11,* 2273-2276) titled “Asymmetric Cobalt-Catalyzed Cyclopropanation with Succinimidyl Diazoacetate: General Synthesis of Optically Active Cyclopropyl Carboxamides.” Snyder and Zhang (along with two former University of South Florida graduate students) also coauthored two chapters for the *Handbook of Porphyrin Science* (Eds. Kadish, K. M.; Smith, K. M.; Guillard, R. World Scientific **2010)** titled, “Metalloporphyrin-Catalyzed Asymmetric Atom/Group Transfer Reactions” and “Porphyrin Functionalizaton via Palladium-Catalyzed Carbon-Heteroatom Cross-Coupling Reactions.” Snyder and Zhang have also submitted a manuscript describing the synthesis of carbohydrate-porphyrin conjugates using a palladium-catalyzed cross-coupling approach. Three Hamilton students, Taylor P. Adams ’11, Kevin W. Graepel ’11 and Peter F. Garrett ‘11 are coauthors of this work.

Snyder has also coauthored several book chapters in the *Named Reactions in Organic Chemistry* series edited by Jie Jack Li of Bristol Myers Squibb. In 2009, Snyder and Kevin W. Graepel ‘11 published a manuscript in *Named Reactions for Carbocyclic Ring Forming Reactions* (Eds. Li, J. J.; Corey, E. J. Wiley **2010**, Chapter 5.3 (489-577)) titled, “Ring Closing Metathesis.” Snyder submitted two manuscripts for the *Named Reactions for Heterocyclic Chemistry* series; one with Taylor P. Adams ’11 on “The Dimroth Rearrangement,” and second with Christopher P. Boisvert ’12 on “The Hantzsch Synthesis of Pyrroles, Thiazoles, and Dihydropyridines.” Both of these manuscripts were published in August 2011.

Teaching has also been on Snyder’s plate. On Class and Charter day 2010, Snyder received *The Class of 1963 Excellence in Teaching Award,* which recognizes a professor in a tenure track or tenured position who has demonstrated extraordinary commitment to and skill in teaching undergraduates. Her courses in Organic Chemistry and the new one in Chemical Immunology were obviously well received by the students. This past August, Snyder co-chaired the Chemical Education Division’s National program for the 240th National Meeting of the ACS in Boston. As co-Chair she was responsible for selecting organizers from all over the country for the individual sessions. She also worked with the organizers to put together a five-day meeting consisting of over 40 sessions, including nearly 450 papers. Snyder also played

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a key role in establishing a symposium where undergraduate students could give oral presentations of their work.

In the summer of 2010 Snyder began a second collaboration with carbohydrate chemist Peter H. Seeberger at the Max Planck Institute for Colloids and Interfaces, Department of Biomolecular Systems in Berlin, Germany on the automated synthesis and biological evaluation of glycans associated with disease. Snyder and two Hamilton students, Taylor P. Adams '11 and Kevin W. Graepel '11, traveled to Berlin to collaborate on the automated synthesis of A2G2F, an *N*-linked glycan associated with glioblastoma multiform (an aggressive brain tumor). Snyder remained in the Seeberger lab as a Visiting Scientist during her 2010-2011 sabbatical. Snyder recently received funding from the Deutscher Akademisher Austausch Dienst (DAAD) for her collaborations with the Seebeger lab, and she was also nominated by the Freie Universität for a Mercator Award. She brought three Hamilton students--Connor W. Brown '12, Alexander Thompson '13 and Megan Schlosser '13--to Berlin in summer 2011 to assist with ongoing collaborations.

NEW FACULTY

When it became apparent that Brad Wile was going to leave for a tenure-track position, we needed to hire someone to fill the remainder of Karen Brewer's time in the Dean of Students Office, and, fortunately, **Tim Chapp** was able to step in for the 2010-2011 year and continue for 2011-2012. Tim grew up in Des Plaines, IL, but because he is fond of ice hockey chose to attend St. Lawrence University in Canton, NY, where he could get his fill of ice hockey while concentrating on the chemistry and biology he was studying in the classroom. While at St. Lawrence, Tim learned to appreciate the Adirondacks, and did a fair amount of rock climbing, as well as playing club and intramural hockey.

The choice of Dartmouth for his graduate work enabled him to continue his interest in hiking, rock climbing and hockey, while doing some excellent work in organophosphorus chemistry under the direction of David Glueck. Tim's spouse, Sarah, also graduated from St. Lawrence; their baby girl, Abi, was born in early 2011.

During the summer of 2011, following his first year, Tim took on four students: Alison Boyaris, '12; Hilary (Kip) Langat, '13; Barsha Baral, '13; and Shawon Akonda, '12. They worked on a variety of projects, including synthesis of some chiral phosphorus ligands as components for aqueous asymmetric induction catalysts, preparation of several porphyrin metal complexes to serve as chiral hosts, and an intriguing study of configurationally constrained phosphorus ligands for potential metal-free asymmetric hydrogenation. This fall Tim has been exploring tenure track positions, and we've just learned that he's accepted a post at Allegheny College in Meadville, PA. We wish him and his family well.

In the last newsletter we reported that we had hired George Shields' replacement, but were not able to identify him by name.

Adam Van Wynesberghe, is now in his third year at Hamilton and is clearly on track for a distinguished research and teaching career. Adam did his undergraduate work at Ohio Wesleyan. Physical and computational chemistry are Adam's expertise, although he has capitalized on his experience teaching general chemistry at the University of Wisconsin, where he completed his graduate work, this fall as he launched into teaching Chemistry 120.

From Wisconsin he traveled to the west coast, where he pursued post-doctoral work under the tutelage of Andrew McCammon at the University of California at San Diego. Since coming to Hamilton, Adam has written and received a prestigious National Science Foundation Major Research Instrumentation grant for $178,000 to upgrade the computers associated with his computational research on protein-protein and protein-ligand interactions.

In his first summer (2009) Adam began his research with Sam Cho, '10, and Jeffrey Sung (UCSD '11). Sam Cho completed his senior thesis with Adam in 2009-2010, and he was joined by Tom Morrell and Carlos Rico. Jeremy Edelman, '13, Anna Hagstrom,(Amherst '13), Erica Losito, '12, and Jeff Sung joined Adam's research group during the summer of 2010 and they all presented work at the Mercury Conference that year. Senior thesis students Rebecca Green, 11, and Laura Leonard, 11, contributed to Adam's projects during the 2010-2011 year, and Dan Mermelstein, '13, Carmen Montagnon, '13, Alvin Wu, '13, and Anna Hagstrom continued their work during the 2011 summer. A Research Corporation grant in 2010 provided

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additional impetus for Van Wynesberghe's research involving a computational study of the association constants of influenza neuraminidase inhibitors. Since coming to Hamilton Adam has taught both terms of Physical Chemistry (Quantum and Thermo) as well as this fall's foray into General Chemistry. Adam will be taking a sabbatical during the spring of 2013, and will stay at Hamilton while pursuing his computational work.
On a more personal note, Adam and his wife, Priscilla, who teaches microbiology at Colgate, had a son, Andrew, this past September.

Myriam Cotten is on leave for 2009 and Tim Elgren will be pursuing an ACE fellowship in the spring, which leaves the Department without coverage for biochemistry courses and labs. Furthermore, with a record number of students in General Chemistry, coverage for the extra laboratory sections was needed. **Egidijus (Egis) Zilinskas**, has come to the rescue. From Lithuania, Egis completed undergraduate and masters' degrees at Kaunas University of Technology, then came to the

US in 2007 to spend a half year at the University of Connecticut in the Environmental Research Institute. He started his doctoral research at Michigan State University but moved to Montana State University to complete his degree when his research supervisor moved there. This fall Egis has taught General Chemistry labs, and in the spring he'll have full responsibility for Chemistry 270, Biochemistry. Egis loves to cook and has already entertained department members at an informal party. Though he likes Hamilton, Egis misses Montana State, since his fiancé, Silvina, is staying there to finish her degree.

WHERE ARE THEY NOW?

During the past several years, several faculty members on temporary appointments who have had a significant impact on students and on the chemistry program itself have joined us for a year or more. In addition, **George Shields**, who joined the department in 1999 as chair, left in 2008 to become the first Dean of Sciences at Armstrong Atlantic State University in Savannah, GA. After three successful years there, Shields joined Bucknell University as their Dean of Faculty.

During the 2005-2006 academic year while one of our organickers was on leave **Stephen Waratuke**, joined us from Susquehanna University. After his time at Hamilton, Steve took a job at Bridgewater State University in Massachusetts, where he recently was tenured. **Ram Subramaniam**, substituted for Tim Elgren while he was in the Dean's Office; he is now splits is time between the University of Santa Clara in San Jose, CA and De Anza University in Cupertino, CA. Physical chemist **Kim Bradley** left the College to work for the Illinois State Police as a forensic scientist. **John LaGraff**, who followed Kim, currently is a lecturer at Siena College in Loudonville. **Karl Kirschner**. who taught physical chemistry for and the Adirondack course for a year in 2005, now resides in Germany with his wife, where he is a senior scientist at the Fraunhofer Institute for Algorithms and Scientific Computing.

Josh Ruppel

Steve Feldgus, a Dreyfus teaching post-doctoral fellow in physical chemistry for a year, left academe to join the public sector, and he is now a staff person in the House of Representatives for the Committee on Natural Resources. **Tom Castonguay,** who filled in for George Shields during 2007-2008, took a position at Iona College, where he currently is teaching physical chemistry. **Patrick Caruana**, who was teaching organic as a sabbatical replacement, was lured away to do research as a postdoctoral fellow at the Naval Surface Warfare Center, in Indian Head, MD. He was replaced by **Josh Ruppel**, who had received his Ph.D. from the University of South Florida with Peter Zhang; after his time at Hamilton from 2009-2011, he moved to the University of South Carolina, Upstate, in Spartanburg with his new bride.

Brad Wile, who was a replacement inorganicker for Karen Brewer while she is in the Dean of Students Office, landed a position in chemistry at Ohio Northern University in Ada, as did his new wife Amelia, who was a postdoc at Cornell while Brad was at Hamilton.

Though they are gone, they are not forgotten. Each has left an indelible imprint on the Department, and we remember them fondly.

STUDENT NEWS

CLASS AND CHARTER DAY COMMENCEMENT AWARD RECIPIENTS

2009: Phillip J. Milner, ‘10: Barry M. Goldwater Scholarship, Willard Bostwick Marsh Prize Scholarship, James L. Bennett Prize, Bejamine Walworth Arnold Prize Scholarship, Donald J. Denney Prize in Physical Chemistry; **Amy C. Klockowski**: Samuel F. Babbitt Kirkland College Fellowship; **Louisa Brown:** Root Fellowship, Phi Beta Kappa, *Summa cum Laude*, Honors in Chemistry and in Art, Underwood Prize; **Yuqi Mao**: Phi Beta Kappa, *Summa cum Laude*, Honors in Chemistry, Underwood Prize; **David Hamilton:** Phi Beta Kappa, *Magna cum Laude*, James L. Bennett Prize, Honors in Chemistry, Root Fellowship, Underwood Prize; **Benjamin van Arnam**: Phi Beta Kappa, *Summa cum Laude*, Honors in Chemistry, Norton Prize, Havoc Service Award; **Michael Flanders**: *cum Laude*, Honors in Chemistry, Phi Sigma Iota (Foreign Languages);**Deacon Lile**: Honors in Chemistry, Phi Alpha Theta (History); **Matthew Kotlove**: *cum Laude*, Honors in Chemistry; **Gregory Hartt, ’08** and **Marco Allodi, ‘08**: Root Fellowships; **Nicholas Berry**: Phi Beta Kappa, *Summa cum Laude*, Senior Prize in Biochemistry and Molecular Biology, Mary McMaster Hallock Prize in Science, Honors in Biochemistry and Molecular Biology; **Matthew Breen, ’11**: CRC Press First-Year Prize in Chemistry; **Sarah Bertino**: Phi Beta Kappa, *Magna cum Laude*, Root Fellowship, Honors in Biochemistry and Molecular Biology and Molecular Biology; **Jared Pienkos**: *Magna cum Laude*, Root Fellowship, Honors in Chemistry; **Kathrine Alser**: Honors in Chemistry; **Andrew Beyler, ’10:** Leo Macta Prize in Physics; **Peter K. Kosgei, ‘11**: Grant Keehn Prize Scholarship; CRC Press First Year Prize in Chemistry, Phi Beta Kappa Book Prize; **Taylor Adams, ‘11**: Dr. Philip I. Bowman Prize Scholarship, ACS and Joint Polymer Education Committee Prize in Organic Chemistry, CRC Press First-Year Prize in Chemistry

Sigma Xi: Louisa Brown, Yuqi Mao, Ben van Arnam, Jared Pienkos, Michael Flanders, Amy Klockowski, Matthew Kotlove, Katherine Alser, Kathryn Manning, David Hamilton,

2010: Phillip Milner: George Lyman Nesbitt Prize (Salutatorian), Phi Beta Kappa, *Summa cum Laude*, Honors in Chemistry, National Science Foundation Graduate Fellowship, Root Fellowship, Benjamin Walworth Arnold Prize Scholarship, Willard Bostwick Marsh Prize Scholarship, Edward Huntington Memorial Mathematical Prize Scholarship, Captain Gerald FitzGerald Dale Senior Scholarship, Norton Prize, Underwood Prize in Chemistry, Kirkland Prize (tie); **Andrew Beyler**: Phi Beta Kappa, *Summa cum Laude*, Honors in Chemical Physics, Southworth Prize in Physics, Root Fellowship; **Tom Nevers**: *Magna cum Laude*, Honors in Chemistry, Donald J. Denney Prize in Physical Chemistry, Mary McMaster Hallock Prize in Science, Norton Prize; **Kate Arpino**: Phi Beta Kappa, *Magna cum Laude*, Honors in Chemical Physics, Root Fellowship; **Gail Corneau:** Senior Fellow, Phi Beta Kappa, *Magna cum Laude*, Senior Prize in Biochemistry/Molecular Biology, Honors in Biochemistry/Molecular Biology; **Fallon Chipidza**: *Magna cum Laude*, Senior Prize in Biochemistry/Molecular Biology, Honors in Biochemistry/Molecular Biology, Jenny Rubin Memorial Prize Scholarship, Omicron Delta Upsilon (Economics); **William Stateman**: Phi Beta Kappa, *Magna cum Laude,* Senior Prize in Biochemistry/Molecular Biology, Honors in Biochemistry/Molecular Biology, Phi Sigma Iota (Foreign Languages); **Ryan Seewald**: Phi Beta Kappa, *Magna cum Laude*, Honors in Chemistry, Phi Alpha Theta (History); **Sam Cho**: *Magna cum Laude*, Honors in Chemistry; **Tom Morrell**: National Science Foundation Graduate Research Fellowship, *cum Laude*, Honors in Chemistry, Root Fellowship, Donald J. Denney Prize in Physical Chemistry, Norton Prize; **Graham Hone**: *cum Laude*, Honors in Chemistry, Root Fellowship; **Ben Saccomano**: *cum Laude*, Honors in Chemistry; **Mark Breazzano**: *cum Laude*, Senior Prize in Biochemistry/Molecular Biology, Honors in Biochemistry/Molecular Biology; **Andrew Boddorf**: Honors in Chemistry; **Sarah Cryer**: Honors in Chemistry, Phi Alpha Theta (History); **Chris Lorenc**: Honors in Chemistry, Root Fellowship; **Alex Isaacs**, Honors in Chemistry; **Carlos Rico**: Root Fellowship; **David Brown**: Honors in Biochemistry/Molecular Biology; **Julianne Tylko**: Honors in Biochemistry/Molecular Biology, Hawley Prize in Latin, Eta Sigma Phi (Classics); **Rebecca Green, ‘11**: Dr. Philip I Bowman Prize Scholarship, Alfred J. and A. Barrett Seaman Prize in Interdisciplinary Writing; **Matthew Breen, ’11**: James L. Bennett Prize; **Lydia Rono, ‘11**: Davis Peace Project Grant; **Taylor Adams, ‘11**: Barry M. Goldwater Fellowship; **Kevin Graepel, ‘11**: Barry M. Goldwater Fellowship Honorable Mention; **Jack Trieu, ’11**, Donald A. Hamilton Prize Scholarship; **Raul Patrascu, ‘12**: Phi Beta Kappa Book Prize, Charles A. Dana Prize Scholarship, CRC Press First-year Prize in Chemistry; **Kate Otley, ‘12**: American Chemical Society and Joint Polymer Education Committee Prize in Organic Chemistry, Charles A. Dana Prize Scholarship; **Alexander Wood, ’12**: Phi Beta Kappa Book Prize, Lawrence K. Yourtee Prize Scholarship, Charles A. Dana Prize Scholarship; **Rem Myers, ’11**: Calvin Leslie Lewis Prize Scholarship in the Dramatic Arts

Sigma Xi: Kathryn Arpino, Andrew Beyler, Andrew Boddorff, Sam Cho, Gail Corneau, Phillip Milner, Tom Morrell, Tom Nevers, Julianne Tylko

2011: Taylor P. Adams, ’11: National Science Foundation Graduate Research Fellowship, Phi Beta Kappa, *Summa cum Laude*, Root Fellowship, Honors in Chemistry, Norton Prize (shared), Underwood Prize; **Connor Brown, ’12:** Barry M. Goldwater Scholarship, James L. Bennett Prize; **Courtney Carroll, ‘11:** Henry Love Fellowship, Phi Beta Kappa, *Magna cum Laude*, Senior Prize in Biochemistry/Molecular Biology, Honors in Biochemistry/Molecular Biology; **Lydia J. Rono, 11:** Samuel Babbitt Kirkland College Fellowship, Root Fellowship,

CLASS AND CHARTER DAY AND COMMENCEMENT AWARD RECIPIENTS, *continued*

continued from page 8

Honors in Chemistry; **Matthew Breen, 11:** Phi Beta Kappa, *Summa cum Laude*, Honors in Chemistry, Edward Huntington Memorial Prize Scholarship in Mathematics; **Kevin Graepel, '11:** Phi Beta Kappa, *Summa cum Laude*, Honors in Chemistry, Norton Prize (shared), COOP Service Award; **Rebecca Green, '11:** Phi Beta Kappa, *Magna cum Laude*, Honors in Chemistry, Mary McMaster Hallock Prize in Science; **Keith Willner, '11:** Phi Beta Kappa, *Magna cum Laude*, Honors in Chemistry, Adam Gordon Campus Service Award; **Andrew Branting, '11:** *cum Laude*; **William Wieczorek, '11:** *cum Laude*, Root Fellowship, Norton Prize (shared); **Jack Trieu, '11:** Root Fellowship, Honors in Chemistry; **Peter Kosgei, '11:** Jack B. Riffle Award for Senior Athlete; **Laura Leonard, '11:** Philip I Bowman Prize Scholarship, Honors in Hispanic Studies; **Courtney M. Carroll, '11:** *Magna cum Laude*, Henry M. Love Fellowship, Root Fellowship, Senior Prize in Biochemistry/Molecular Biology, Honors in Biochemistry/Molecular Biology; **Peter Garrett, 11:** Honors in Biochemistry/Molecular Biology; **Nathan Schneck, 'll:** Thomas Watson Fellowship, Honors in Biochemistry/Molecular Biology, COOP Service Award; **Ke Xu, '11:** Honors in Biochemistry/Molecular Biology; **Rem V. A. Meyers, '11:** J. W. Fulbright Grant, Honors in Theater; **Aaron Danilack, '13:** ACS and Joint Polymer Education Committee Prize in Organic Chemistry, CRC Press First Year Prize in Chemistry, Phi Beta Kappa Book Prize, Charles A. Dana Prize Scholarship; **Miles Blackburn, '13:** Charles A. Dana Prize Scholarship, Phi Beta Kappa Book Prize

Sigma Xi: Taylor Adams, Matthew Baxter, Kevin Graepel, Rebecca Green, Laura Leonard, Lydia Rono, Nathan Schneck, Leighanne Sherrow, Jack Trieu, Keith Willner, William Wieczorek,

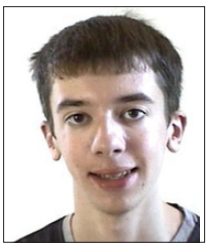
Congratulations to all the graduates in chemistry, biochemistry and chemical physics from the three recent classes. **2009**: Katie Alser, Alexa Ashworth, Nick Berry, Sarah Bertino, Louisa Brown, Michael Flanders, David Hamilton, Tom Irvin, Abby Jones, Amy Klockowski, Matt Kotlove, Deacon Lile, Kathryn Manning, Yuqi Mao, Divij Mathew, Jared Pienkos, Gillian Smith and Ben van Arnam. **2010**: Kate Arpino, Andrew Beyler, Andrew Boddorff, Mark Breazzano, David Brown, Fallon Chipidza, Sam Cho, Gail Corneau, Sarah Cryer, Graham Hone, Alexandra Isaacs, Ari Kaphan, Jim Langan, Chris Lorenc, Jared Mereness, Phill Milner, Tom Morrell, Tom Nevers, Carlos Rico, Ben Saccomano, Ryan Seewald, Wynn Stateman, Julianne Tylko, and Ben Weissman. **2011:** Taylor Adams, Matthew Baxter, Daryl Berke, Andrew Branting, Matthew Breen, Courtney Carroll, Peter Garrett, Kevin Graepel, Rebecca Green, Peter Kosgei, Annie Lee, Kathy Lee, Laura Leonard, Rem Myers, Lydia Rono, Rebecca Rowe, Nathan Schneck, Leighanne Sherrow, Jack Trieu, Billy Wieczorek, Keith Willner, Elena Wood and Ke Xu.

NATIONAL AWARD WINNERS

Since the last newsletter, several chemistry and biochemistry majors have won national awards, and one, **Phill Milner,** '10, also won the George Lyman Nesbitt Prize for being salutatorian of his class. Phill also won a Goldwater Fellowship for 2009-2010 and parlayed that into a National Science Foundation (NSF) graduate research fellowship, which he is using to support his graduate studies at MIT. Now in her third year in graduate studies at Cornell, **Louisa Brown**, '09, was also awarded an NSF fellowship in 2010. Graduating senior **Tom Morrell**, '10, also was granted an NSF fellowship; he is now in his second year of graduate work at Princeton. For his work with Nicole Snyder, **Taylor Adams**, '11, received a Goldwater fellowship for his senior year. He also won an NSF fellowship and began graduate school at California Institute of Technology this fall. **Kevin Graepel**, '11, also a Snyder research student received honorable mention in the Goldwater competition. He currently is pursuing an internship at the National Institutes of Health, and expects to attend graduate school when he finishes. Based on his research done in an NSF sponsored program at Washington State University during the summer of 2010 and his excellent record at Hamilton, **Connor Brown**, '12, was awarded a Goldwater Fellowship for his senior year. Connor spent last summer in Germany carrying out research in the Seeberger laboratory at the Max Planck Institute with Nicole Snyder. Next year he will enter graduate school in bioorganic chemistry.

Phill Milner

Louisa Brown



Tom Morrell

Taylor Adams

Kevin Graepel

Connor Brown

STAFF NOTES

Since **Greg Rahn's** arrival in January 2008 Greg has had a significant impact on all the sciences in Taylor Science Center, but most significantly on the Chemistry Department. He arranged for the acquisition of a used ESI mass spectrometer for use as an adjunct to the Thermo LC/MS that was acquired through a grant in the summer of 2007. He and a colleague brought it back from the NIH on a pickup and Greg managed to get it up and running again with minimal cost. This fall Greg is teaching one of the laboratory sections in Chemistry 125, and being especially effective at convincing the students in his section that aspects of analytical chemistry are important. Together with Bruce Wegter, an instrumental adjunct with the Geosciences Department, Greg has been able to generate some very useful data on their isotope ratio mass spectrometer (IRMS). He and Bruce also attended a conference on IRMS in Toronto during the 2011 summer. **Sue Senior** continues to provide good lab experiences for General Chemistry, Biochemistry and Organic students. She attended the MAALACT conference this past fall and found it very instructive. **Chuck Borton** helped to revamp the labs for Chemistry 125, and he has made major contributions to the design of the labs in Inorganic Chemistry. Chuck's family is close to the Adirondacks, and he and his family spend a good bit of time, both summer and winter, in the family camp on Long Lake. **Shawna O'Neill**, **'92**, who joined the department in 2002 as Director of Laboratories, connects us to the outside world of vendors and the Business Office. For the past two years Shawna has taught a lab section of General Chemistry in the fall and a lab section of organic in the spring. She says that the interaction with the students makes her job more interesting.

CHEMISTRY CONFERENCES AT HAMILTON, 2009-2011

Mercury Conferees at Hamilton 2010

MERCURY: The summer brings the opportunity to get researchers together to share their accomplishments and their progress on a variety of research and educational projects. For the past ten years, the Mercury conference has brought together researchers, principally undergraduates, involved in computational chemistry. Started by George Shields, the most recent Mercury conference was held at Bucknell University. The keynote speakers for these conferences come from both academia and from industry and represent such institutions as Georgia Tech, Penn, Carnegie Mellon, and University of California at San Diego. In 2009, Nobel Laureate Roald Hoffman from Cornell gave a major lecture. Students from Hamilton who presented posters in 2010 were: Jeremy Adelman, '13, Anna Hagstrom, Amherst '13, and Erica Losito, '13; in 2011, Alvin Wu, '13, Carmen Montagnon, '13, and Dan Mermelstein, '14, presented posters at Bucknell.

CHOG: In 2011, the Colgate-Hamilton Organic Group convened at Colgate with a new moniker. The addition of students from Hobart-William Smith meant that the name needed to be changed, and the new acronym is SMORGS, for SuMmer ORGanic Symposium, at least for the time being. Students from Hamilton who participated were: Aaron Danilack, '13 and Miles Blackburn, '13 (Kinnel group); Allie Boyaris, '12, Shawon Akanda, '12, and Kip Langat, '13 (Chapp group)

MAALACT: Every year the Middle Atlantic Association of Liberal Arts Chemistry Teachers meets at a different college. Formed in 1967, MAALACT provides a forum for college chemistry faculty to exchange ideas about how better to teach chemistry, to garner grants, and to make their research time more effective. Hamilton was the venue for the 2011 meeting, and the highlight was the inspiring plenary lecture given by Terry Collins, the Teresa Heinz Professor of Green Chemistry at the Institute for Green Science, associated with Carnegie Mellon University, on Friday evening The fifty-odd registrants then explored a variety of topics in round table format on Saturday morning, as well as hearing presentations on laboratory safety, implications for chemistry departments from the coming changes in the medical college admission test, and involvement of chemistry faculty in teaching courses to non-science students. Robin Kinnel, this year's MAALACT president, and Karen Brewer organized the meeting.

Hamilton Chemistry recognized at Chiefs game