Table of Contents

2  Chair’s Message
4  Faculty/Staff News
14  Publications

Then & Now  16
Student News  17
Thank You!  21

"The laboratory represents what mankind hopes to know." -

Photo above from the F&M Archives: Fackenthal Laboratories (home of the Chemistry Department up to 1969), shortly after dedication in 1929. Notice arched wall extending to Biesecker Gym.

Photo on cover: F&M Chemistry 2013 Summer Research Scholars (see page 19)
Dear Alumni & Friends of the Department:

This past year has been a busy and successful one for our department. In addition to our research programs and our classes, the department completed two successful searches for a biochemist and an inorganic chemist, Dr. Gabriel Brandt and Dr. Amy Hofmann (F&M alumna, 2004), respectively. These talented individuals join a department of faculty members devoted to teaching high-quality courses and committed to the importance of undergraduate research as the ultimate form of education for our students. I also have the pleasure of congratulating Dr. Scott Brewer who was awarded tenure in Spring 2013. His exciting research program has engaged talented student and faculty collaborators and to date resulted in 12 publications with 31 student co-authors (17 individual students, some on multiple publications). Overall, our classes remain full with interested students. Our research program has continued to result in active academic year research, a vibrant summer research program [29 summer research students, 4 recently graduated F&M students and 3 Moore-Schaeffer students who matriculated at F&M in Fall 2013], and peer-reviewed publications that include many of our students.

I regret sharing that Carol Strausser has decided to retire from her position as Academic Coordinator. Her goal in the department over the past 42 years has always been to keep the department running smoothly, which she has done with grace and careful attention to details both large and small. Over the decades, she has accepted challenges from the department both willingly and enthusiastically, for which we are forever grateful. An example of Carol’s contribution to the work of our faculty can be seen in Dr. Ed Fenlon’s discussion of his interesting history of the National Organic Symposium. We are also thankful that Dr. Yoder has offered to coordinate the newsletter this year. We also welcome our new department coordinator, Julie Gemmell.

I was able to continue my research with the help of Anthony Wishard ('13) and Phillip Slogoff-Sevilla ('13), both of whom presented research posters at the National ACS meeting. They have now moved on to Tulane (Anthony) and University of Illinois at Chicago (Phil) for graduate school. During Summer and Fall 2013, Ryan Brenner ('15) continued our investigation of the interactions among molybdate, single mineral phases, and simple organic molecules as proxies for more complex humic material found in marine waters. In collaboration with Dr. Claude Yoder, Emily Christie ('15) began a project using NMR to investigate aqueous molybdenum-organic complexes. I have been extremely fortunate to have such wonderful collaborators.

My family had its own addition this year when Theresa joined her two big brothers on April 9th. Theresa is currently on a mission to discover every small item left on the floor, while Gregory, our ten year old, enjoys anything powered by electrons. Benjamin is now 4 years old and is obsessed with Legos. Our transition to quintet has been joyously crazy.

Finally, I would like to thank our alumni who have made donations to the department. These gifts allow us to enhance our teaching and, particularly, our student-faculty research. The department is extremely grateful for your support.

Please drop me a note and let me know how you’re doing or stop by if you’re in Lancaster. If your sons, daughters or friends decide to visit F&M, please contact the department. We are always excited to chat with prospective students and families and to show them around the department.

All the best for a successful and enjoyable year,

Jennifer Morford, Chair and Associate Professor
jennifer.morford@fandm.edu
717-358-4590

This year’s issue of the Chemistry Newsletter is dedicated to:

Carol Strausser
For her 42 Years of dedicated service to the F&M Chemistry Department
AMY JOINED THE DEPARTMENT AS A TENURE-track Assistant Professor in July 2013. Inorganic Chemistry will be her primary teaching responsibility. A 2004 graduate of Franklin & Marshall, Amy earned her Ph.D. in Geochemistry from Caltech in 2010 and then completed a two-year postdoctoral position at UC, Berkeley in 2012. Her research centers on elucidating the molecular-scale mechanisms that govern the incorporation of impurities into solids during crystal growth.

Hofmann: It is both thrilling and humbling to have returned to my undergraduate alma mater in this new capacity! As one of the newest members of the department, I’m still learning all of the secret goings-on behind the curtain, but I confess that I am very much enjoying doing so. I graduated from F&M in 2004 (a product of the Department of Earth & Environment), but the 3rd floor of Hackman feels like home to me now. I received my Ph.D. in Geochemistry from the California Institute of Technology in 2010 and then headed to Berkeley where I spent three years as a postdoc. My research broadly addresses the thermodynamic and kinetic driving forces that govern impurity incorporation in naturally occurring inorganic solids.

At F&M, I’ll be teaching both introductory chemistry and the upper-level inorganic course. In my not-so-copious free time, I can be found cycling, tromping around Civil War battlefields, and indulging in a love of all things science fiction.

GABRIEL JOINED THE DEPARTMENT IN JULY 2013 as a tenure-track Assistant Professor with a primary teaching responsibility in Biochemistry. He graduated in 1992 with a B.A. from Reed College and received his Ph.D from Caltech in 2003. Prior to coming to F&M, Gabriel completed a four-year postdoctoral stint at Johns Hopkins’ Malaria Research Institute. His research encompasses the atomic and molecular scale of natural processes; specifically, understanding the virulence mechanism of the malaria parasite P. falciparum and developing chemical tools for using light to control biochemical processes as they occur in cells in real time.

Brandt: I’ve been incredibly grateful for the department’s guidance, advice, and support that I’ve relied on to get through my first semester at F&M. I taught two sections of General Chemistry, which seemed pretty doable until I actually tried doing it. I guess this is the first part of Benjamin Franklin’s “bold and arduous project of arriving at . . . perfection.”

In terms of research, I’ve been scouring the Internet to find the optimal suppliers of reagents, pieces of small equipment and services that our lab will require. More importantly, perhaps, I’ve lured some unwary students into joining the research effort come spring and summer. I have two Biochemistry and Molecular Biology students (Alex Lieber ’15 and Min Hong ’15) who will get the lab up and running in the spring. The greatest interest seems to be in my more biochemical projects thus far, but I have one chemistry major Taylor Hughes ’15 who’s willing to brave the solvent-scented air of the synthetic side of the lab over the summer.

I’ve also been applying for funding. I have a proposal to make photoactive drugs under review at Research Corporation, and one at the American Philosophical Society on inhibitor screening of kinases secreted by malaria parasites.

After the new year, I’ll be trying to juggle the complete set of balls, with Advanced Biochemistry, a section of General Chemistry lab, and two CHM390 students working in the lab. Wish me luck.

I HAVE NOW ENTERED A PERIOD OF MY CAREER that we call phased retirement. That’s where you promise not to teach (or at least just a little) and do whatever else can be called scholarship. And, of course, your pay decreases proportionately. This summer, my first on phased retirement, I worked with seven research students, Jennifer Goldenberg ’14, Anna Smith ’16, Linh Tran ’16, Tierney Wohlgemuth (Washington and Lee), Ben Guttenstag ’16, Emily Christie ’15, and Molly Carney (Moore-Schaeffer Mentorship), who were both entertaining and productive.

During the Spring semester, my last batch of Chem 112 students showed a remarkable diversity of talent and interest. My two research students Zach Wilt ’13 and Demetra Schremmerhorn ’13 did fine work in the laboratory and already have several publications, with more coming soon. Both are headed to medical school—Zach to Jefferson and Demetra to a Medical Science program at Boston University.

Our research continues on apatites, with a focus at the moment on the location of carbonate, important for the growth of bone, in the apatite structure. After two years of training on the Rietveld method for structure determination from powder X-ray diffraction data, Zach was able to obtain...
very good results for a variety of apatites. Our first Rietveld paper has just been finished.

The first issue of F&M Scientist was published this past winter with the help of co-editor Carol De Wet, and Carol Strausser, Anita Focht, and other folks in Publications. I am particularly grateful to those of you who contributed to the first volume. The response has been excellent. I hope that we can grow the journal into a first rate College Science publication.

I value the continued support of my collaborators Jill Pasteris of Washington University and Charles Schaeffer, Jr., now retired from Elizabethtown College. I am indebted to all of my colleagues in the department, but especially to our Chair, Jennifer Morford, and Ken Hess, for carving up the last bit of useable space in the department for an office inside of a lab, both of which I use for my research. I am also very appreciative of the moral and financial support that many of you have provided for the department and me.

I HAVE BEEN ON SABBATICAL LEAVE DURING THE 2012-2013 academic year. After spending three months in the research lab last fall, during the spring semester I wrote three scientific papers and worked closely with two former students/preceptors to modify substantially the Foundations course on environmental issues in chemistry. Three excellent research students (Chris Bemis ’14), Munsha Sidhu ’14, and Sylvia Zohrabian ’13 also conducted CHM 390 research in the spring. This summer our research group expanded to a total of six: Chris Bemis ’14 as lab leader, Joe Mohrbacher ’15, Kevin Khant Khine ’15, Don Viray ’16, Dave Mix ’17, and George Eitzen ’17. Undergraduate research continues to offer me immense satisfaction.

On a personal note my daughter Carolyn received her M.S. in Clinical Psychology in May and recently started her first (Yipee!!) fulltime job. As a therapist working with adults who have suffered traumatic brain injury, she finds her work very fulfilling.

TEACHING GENERAL CHEMISTRY IS A GREAT opportunity to interact with new students and hopefully inspire them to continue in the sciences. I am now gearing up to teach a new senior capstone course about which I am very excited. The course "Materials Chemistry" will focus on understanding the relationships between chemical structure and properties and function of technological devices. We will focus to a degree on the chemical principles behind modern liquid crystal-thin film transistor technology. This will be a great follow up to the well received "Chemistry of Solar Energy Conversion" elective course I taught last year.

Research continues to be fun and productive. Three new research students, Christian Kim ’14), Cole Wisdo ’15), and Jiaming (Nick) Gu ’16), joined Nathaniel Freymeyer ’14) and graduate Laura Heller ’13) last summer. We had a fun summer involving lots of science and ice cream. Laura, who has just begun graduate school at Georgetown University, advanced our knowledge of the self-assembly of thiophene molecules as part of a collaborative project with Prof. Kris Kolonko at Sienna College. Christian, Cole, Nick, and Nathaniel are all contributing to our studies of the synthesis and optical properties of semiconductor nanoparticles. We have published on both projects this year and our first patent has been allowed.

DURING 2012-13 I CONTINUED TO TEACH organic chemistry but also taught a general education course for the first time in my career. "Pills, Pills, Pills" was a Foundations course that focused on contraception, estrogen replacement therapy, erectile dysfunction, and HIV-AIDS. I had a great group of students and Carl Djerassi was among the authors we read.

Research students working with me on the azide probes project included Hongyi Kyle Pan ’13) and Elise Tookmanian ‘15). Scott Brewer and I continue collaborations with chemists at
Scott Brewer

U. of Iowa, Notre Dame, and U. Nevada, Reno. Ian Fucci ('14) continued work on the synthesis of stable hydrocarbon radicals for use in an NMR technique known as dynamic nuclear polarization (DNP). This project is challenging as we are competing with groups at MIT and Ohio State. Amy Lakin ('14) joined the group and is working on a new project to design and synthesize environmentally green musk perfumes. Kyle graduated in May and is now in a post-Baccalaureate program at Drexel University.

This past June my collaborator Brian Myers at Ohio Northern and I published our paper on chemical history as "Profiles in Chemistry: A Historical Perspective on the National Organic Symposium" which appeared in the *Journal of Organic Chemistry* (JOC). The paper was featured on the journal cover (see below) with artwork by Carol Strausser! I also presented this project as a poster at the NOS in Seattle in June. The response to this work has been very gratifying – the paper was the 5th most read paper in JOC in July and was one of the top 10 most read papers in JOC for the second quarter (April-June) of 2013. C&E News also interviewed me and did a story on it as part of the report from the symposium. They even created an NOS online quiz based on the article, which you can take here: http://cenm.ag/nos.

In terms of service, I was elected to the Professional Standards (rank and tenure) Committee and served my first year. The work is very demanding and gives me a new appreciation for the excellent work done by my F&M colleagues across campus.

Ethan is now in high school, joined the Marching Band this past summer, and got a new alto saxophone (YAS-62) for his birthday. You can see his band in this YouTube video: http://tinyurl.com/qxvnsjl. Stephanie '89 continues her freelance copy editor work for the European Journal of Organic Chemistry and Wiley-VCH, keeps an eye on the Euro-Dollar exchange rate, and enjoys yoga classes. Please keep in touch.

**THIS HAS BEEN AN EXCITING YEAR! I RECEIVED tenure and was promoted to Associate Professor. I would like to especially thank my research students and colleagues that made this accomplishment possible.**

My research continues to focus on the development of vibrational reporters of local protein structure and dynamics. The research during this past year resulted in a *Journal of Physical Chemistry B* article, which focused on expanding the utility of the vibrational reporter unnatural amino acid (UAA), 4-cyano-L-phenylalanine through isotopic labeling. We have also recently synthesized a new UAA, 4-azidomethyl-L-phenylalanine to utilize the azide group as an effective vibrational reporter of local environment. This UAA was genetically incorporated into superfolder green fluorescent protein (sfGFP) with high efficiency and fidelity into two distinct sites to illustrate the high sensitivity of the azide asymmetric stretch vibration to local protein environments.

Christine Phillips-Piro and I have also started to collaborate to determine the crystal structure of sfGFP constructs containing UAAs to explore the structural consequences of UAA incorporation on native protein structure.

Ed Fenlon and I have continued to collaborate on the development of azido-modified nucleosides such as 2’-azidoadenosine to probe protein-nucleoside interactions. We are also studying the development of a series of azido-modified UAAs.

Ken Hess, Ed Fenlon and I have also begun to develop an effective synthesis of the ganglioside GM3 to treat Amish children suffering from GM3 Synthase Deficiency.

Christopher Bazewicz ('12), Kevin Hines ('13), Melanie Liskov ('13), Elise Tookmanian ('15), and Nicole Maurici ('16) conducted research on the development of unnatural amino acids to serve as vibrational reporters, Hongyi Pan ('13) conducted research on the azido-modified nucleoside FTIR absorbance spectra of sfGFP containing either pCNPhe or an isotopomer of this UAA genetically incorporated at a solvent exposed position (site 134) in the protein.
project, and Joshua Wesalo ('13) and Jonathan Salandra ('14) conducted research on the GM3 project.

For the 2012-13 academic year, I again taught CHM 111 and CHM 322. Two students, Peter Sun ('15) and Marvin Nicoleau ('16), served as Hackman research students during the summer, investigating the solvent characteristics of polyglycols and their dimethyl ethers. In September 2012, I was a speaker at a very interesting conference that brought together experts in cognitive and educational psychology with leaders in research-based approaches to science pedagogy. Then, in May I was a keynote speaker at the Human Anatomy and Physiology Society national meeting. I am not sure why they thought it was a good idea to have someone who has never studied either anatomy or physiology talk to them, but they seemed to enjoy learning about, and experiencing, student-centered group learning approaches to teaching science. The POGIL (Process Oriented Guided Inquiry Learning) Project continues to be headquartered in college-owned space on College Avenue, providing professional development workshops and curricular materials for instructors at both the high school and college levels. This past year saw the release of our first materials for mathematics – a collection of activities for Calculus 1. There are now eight employees at the POGIL Project office, and that keeps me busy as a second job!

My research interests in mechanistic organic chemistry continue. Two chemistry majors and I have been investigating organic photochemical reactions in order to determine the mechanism of two reactions: photo-acid catalyzed acetal formation reactions and the photo-Cannizzaro reaction. This year Greg Oppenheim ('14) has been working on the former project and Madison Herling ('14) has been studying the photo-Cannizzaro reaction.

Both of these seniors will be presenting their research at the national ACS meeting in Dallas in March 2014. In addition to organic photochemistry, two students have been studying linear free energy relationships in electrophilic aromatic substitution reactions of benzamides with various electron donating and withdrawing groups.

This has been a fun and busy year both academically and personally! In February, I welcomed my son, Finn and it has been a joy watching him grow. Not quite ready for lab yet, but I hope to have him holding a pipetteman by the end of 2014.

In the summer both Andrew Dippel ('14) and Greg Olenginski ('15) worked with me on a research project looking at how a certain bacteria can sense the halogenated small molecule pollutants trichloroethene and tetrachloroethene. We made great progress this summer and I look forward to seeing where this project leads in the new year.

Professor Brewer and I are also collaborating on a project examining the structural impacts of unnatural amino acid (UAA) incorporation into proteins with GFP (green fluorescent protein) as a model system. Melanie Liskov ('13) and Nicole Maurici ('16) worked with us this summer on this project with Andrew Dippel ('14) joining the project this fall. This past November, Nicole and Andrew accompanied Professor Brewer and myself to the synchrotron at the Argonne National Lab to collect X-ray diffraction data. The trip was a great success, and we are now primed to process a lot of data and put together a paper, which will include a number of student authors.

I also had the pleasure of teaching Introductory Biochemistry again this fall and for the first time General Chemistry. It’s been a busy but really fun semester to have the opportunity to work with both the upperclassmen in Biochem and the first year students in Gen Chem. The Biochemistry students helped design and implement a new assay into the lab component of the course, which was a great success! I’m excited to teach the second half of General Chemistry this coming spring. Hope everyone has a great 2014!
A NOTHER YEAR ANOTHER NEW PROJECT! WE made good progress on our study of the Hantzsch ester analogs (amide and ketone) as transfer hydrogenation reagents. Quynh Nguyen (’15) and I worked on the project this past summer after good preliminary results while I was on sabbatical last fall. Some of that work was presented at the National Organic Chemistry Symposium at the University of Washington in June. Tram-Anh Pham (’14) completed the synthesis of a potential dendritic fluorescent chemosensor and is currently in the process of studying its binding properties. A new teaching project I have going involves the use of video as a supplement to written answer keys for homework exercises. Look for me on the daytime Emmy awards.

At the National Organic Chemistry Symposium in Seattle this past June I made several side trips as part of what I am calling my Hackman 406 tour. Of course our very own Ed Fenlon was also at the symposium and I met him at the airport; so he was the first “one-time occupant” of that office I saw on the trip. I also visited with former occupants (in order of occupancy) Eric Scharrer, Chris Hammann, and Ryan Mehl. It was also good to see other Fummers at the meeting. If you weren’t listed here I still hope that you are doing well and I would love to hear from you.

I’VE GREATLY ENJOYED MY RETURN TO FULL-time faculty status and my first year as the mentor for the Miami STEM Posse Scholars (www.possefoundation.org). The Scholars all completed great work in and out of the classroom, finished their first year in excellent fashion, and I’m very proud of them.

In the research lab, we are continuing the collaboration with the Clinic for Special Children on the GM3 Synthase deficiency project. A genetic mutation present in Old Order Amish families results in the inability to produce GM3 synthase, a key enzyme involved in the biosynthesis of glycosphingolipids such as the ganglioside GM3.

This molecule plays a role in cell adhesion, cell signaling, oncogenesis, and central nervous system development, and is a biosynthetic precursor to other higher order gangliosides. The resulting GM3 deficiency causes developmental delay, epileptic seizures, blindness, and is ultimately fatal by early adolescence. A proposed treatment involves providing GM3 by subcutaneous injection, provided a sufficient quantity of GM3 can be obtained. Past efforts directed at the extraction and analysis of gangliosides from natural sources were modestly successful, but limited. In collaboration with department colleagues Ed Fenlon, Scott Brewer, and Christine Phillips-Piro, a new project is underway to produce GM3 synthetically, in large quantities and at a relatively low cost. I’ve been fortunate to have three great students work on the project over the last year. After joining the group in the Spring, Brittany Sembler (’13) initiated the synthetic work and laid the foundation for Jon Salandra (’14) to take over during the summer. When not on the basketball court listening closely to Glenn Robinson, Jon can still be found in the lab doing an excellent job driving the research forward. Josh Wesalo (’13) made significant progress on the synthesis during his Independent Study and stayed in Lancaster to continue working both in my lab and at the Clinic for Special Children while applying to MD/PhD programs.

Julie and the family are doing well with the kids growing fast. Cooper’s getting ready to drive and starting to think about colleges, while Jessie has moved on to middle school. Both still play travel ice hockey with the Lancaster Firebirds, and Jessie also plays for the Quakers, a tier 1 girl’s team in West Chester. You can guess where we spend our free time. As always, I hope all is well in your lives and careers.

I’M VERY EXCITED TO AGAIN HAVE THE opportunity to work with the students and colleagues at F&M this year as a Visiting Assistant Professor.
During this last academic year, I was again busy getting reagents and equipment ready for teaching labs, manning the stockroom for students and faculty doing research, ordering chemicals and equipment, becoming proficient with the new Banner system that now controls our lives, and helping prepare for the advent of two new faculty and the move of one phased-retired guy. Summers are always a stimulating challenge—over 30 research students and four sections of Johns Hopkins Center for Talented Youth to assist. On a personal note my oldest son graduated from college and entered a graduate program. One down and two to go before achieving empty nest nirvana.

The Agilent 500 MHz NMR continues to be a significant research tool for the department. New pulse sequences for solids NMR have resulted in better looking spectra for Dr. Yoder’s apatite samples, and the improved automation programs make it much more efficient to run samples requiring overnight acquisitions. Although H-1 and C-13 are by far the most requested nuclei, I still get a variety of requests for other nuclei, which for the past year included the following (number of spectra in parentheses): H-2 (55), Li-7 (5), N-15 (17), F-19 (7), P-31 (40), Na-23 (5), Mo-95 (7). I also ran a total of about 100 2D spectra, as well as the old standbys (over a 100) APTs, and DEPTs.

——Staff News——


——Publications cont.—


Then & Now

This photo is labeled “FRESHMEN CHEMISTRY IN FACKENTHAL, ca. 1950”, but Professor Emeritus Austin Rich believes that this may have been the Quantitative analysis lab. Austin also explains the attire of the students by suggesting that this was hell week. Notice the absence of safety glasses, gloves, etc. and the presence of those fantastic hoods. Alternative hypotheses are welcome and should be sent to cyoder@fandm.edu.

First year students in Hackman 311, 2012

Student News

Class of 2013

Best of Luck!

Druv Bhalla
Industry

Patrick Cunningham
Univ of Chicago Graduate School
Manager and Auto Mechanic

Benjamin Dailey
Industry

Nik Economy
Law Firm Intern

Gregory Florek
Georgetown Univ Graduate School

Laura Heller
Teach for America

Barton Linderman
Jefferson Univ Medical School

Melanie Liskov
Registered Patent Agent

Stephen London
Health/Health-policy Career

Yujun (Audrey) Mao
Drexel Univ Post-Baccalaureate Program

Hongi (Kyle) Pan

Demetra Schermerhorn
Boston Univ Medical Sci Program

Brittany Sembler
Vet Tech, in preparation for Veterinary School

Phillip Slogoff-Sevilla
Univ of IL at Chicago Grad School

Joshua Wesalo
Clinic for Special Children in preparation for PhD/MD Program

Zachary Wilt
Jefferson Univ Medical School

Anthony Wishard
Tulane University Graduate School

James Wolf
Equity Analyst at the Haverford Trust Company
PHI BETA KAPPA

MORE THAN 35 STUDENTS PARTICIPATED IN THE SUMMER research program with twelve faculty serving as mentors. The mix included several seniors who stayed on for several weeks before heading to graduate or medical school, three Moore-Schaeffer students (high school students conducting research before their first semester at F&M), and two Miami STEM POSSE Scholars students.


Cole Wisdo, Peter Sun, Nathaniel Freymeyer, Ian Fucci, Andrew Dipple, Christian Kim, Alex Kim, Kevin Khine, Gregory Oleninski, Marvin Nicoleau, Quynh Nguyen, Elise Tookmanian, Chris Bemis, Amy Lakin, Nicole Maurici
National ACS Meeting

posing with their costumed ACS hosts are from left: Phillip Slogoff-Sevilla ('13), Laura Heller ('13), Hannah Metheny ('14) and Anthony Wishard ('13). They were joined by Kyle Pan ('13) and Patrick Cunningham ('13) and each presented research posters at the American Chemical Society National Meeting held in New Orleans in April 2013. Phil and Anthony were mentored by Dr. Morford, Hannah worked with Dr. Thomsen, Laura and Patrick completed their research with Dr. Plass, and Kyle completed his research with Dr. Fenlon. Their poster titles were:

- Tunable properties of covellite microparticles (Cunningham)
- Synthesis and self-assembly of alkyl-functionalized thiophenes (Heller)
- Substituent effects in the electrophilic aromatic bromination of anilides (Metheny)
- Synthesis of photocaged azido-ATP (Pan)
- Investigations into Mo complexation with small organic molecules (Sloggoff-Sevilla)
- Molybdate and tetrathiomolybdate adsorption to pyrite in the presence of select organics (Wishard)

Thank you for your donations!

Your generous financial support enables Franklin & Marshall and your Chemistry Department to continue to flourish. Your gifts are very important and much appreciated. Contributions were received from the following during the past year:

F&M Fund in support of Chemistry: Bonnie Wolf Bloom ’87 and Ted Bloom; Sara A. Brown ’10; John L. Burmeister, Ph.D. ’59 and D. Aileen Burmeister; Mark M. Chamberlain, Ph.D. ’53 and Barbara Chamberlain; Mark Chilton, M.D. ’76 and Sharon Chilton; Barry Cooper, M.D. ’67 and Lynn Cooper; Kim Brown Even, O.D. ’82 and Ralph Craig Even ’81; John M. Fosnocht, D.D.S. ’54 and Roberta J. Fosnocht; Jay Richard George ’72 and Shirley George; Judith Greene W’43; Allison K. Griffith ’10; Pui Shing Ho, Ph.D. ’79 and Margaret Ho; Donald E. Hoffman, Ph.D. ’52 and Dolores Hoffman; Neil H. Jones, Ph.D. ’57 and Dolores Wesley Jones; Stephan A. Klopacic, Ph.D. ’92 and Melissa Klopacic; Ronald Krol, M.D. ’09 and Karen Krol ’09; David K. Lee, Ph.D. ’04; Charles M. Lieber, Ph.D. ’81, P’15 and Jennifer Karas Lieber, Ph.D. P’15; Melanie Liskov ’13; Lilian Leung Louie, Ph.D. ’76 and Peter Louie; Jennifer McGuinn ’95 and Scott Mente, Ph.D.; W. Scott Moore, M.D. ’74 and Anne Moore; Warren Nachlis, Ph.D., J.D. ’87 and Debra Jacob-Nachlis, Esq. ’90; Francis Narin, Ph.D. ’55 and Carole Narin; Hongyi Pan ’13; David C. Powers, Ph.D. ’06 and Tamara M. Powers, Ph.D. ’08; Daner R. Reider, M.D. ’63 and Susan K. Reider; Nathan Rosenblum, M.D. ’68; Jean M. Samii W’61; Robert Sauter, D.O. ’57, P’80 and Margaret Sauter; Howard D. Schechter, M.D. ’75 and Janis I. Schechter; Michael Sobel, D.O. ’79, P’15 and Jodi Benett, D.O. P’15; Stephen J. Steinbacher P’03 and Sharon M. Breitenbeck P’03; Kelly Luther Stern, M.D. ’78 and Craig Stern; Andrew B. Turner, Ph.D. ’62; Mark Wachtler, Esq. ’69 and Virginia Wachtler; Paul W. Weibel, Jr., M.D. ’76 and Cathlene Weibel; David C. Zecher, Ph.D. ’63 and Karen Zecher; Pfizer Foundation Matching Gifts Program, thanks to Ann and Francis Beideman, Jr., Ph.D. ’72.

Endowments benefiting Chemistry: Richard C. Barth, Ph.D. ’71 and Carol A. Barth; Thomas P. Beebe, Jr., Ph.D. ’82 and Claudia Beebe; Samuel O. Grim, Ph.D. ’56 and Rebecca A. Allen; Ralph Even ’81 and Kim Brown Even, O.D. ’82; George F. Martin, Ph.D. ’79 and Jane Martin; Thomas J. Martin, M.D. ’56, P’96 and Lois D. Martin, D. Min.; John Moore, Ph.D. ’61 and Elizabeth Moore; Robert B. Pepinsky, Ph.D. ’76 and Laurelee Osborn; Charles D. Schaeffer, Jr., Ph.D. ’70; Debra Salkin Swaim, Ph.D. ’76 and Robert Swaim, Ph.D.; Jane L. Beers Zboray ’76 and James A. Zboray, Esq.

For information about how to support the Chemistry Department during your life or via a legacy gift through your estate plan, please contact Stefanie Valar, Director of Gift Planning (717-291-4272; stefanie.valar@fandm.edu).