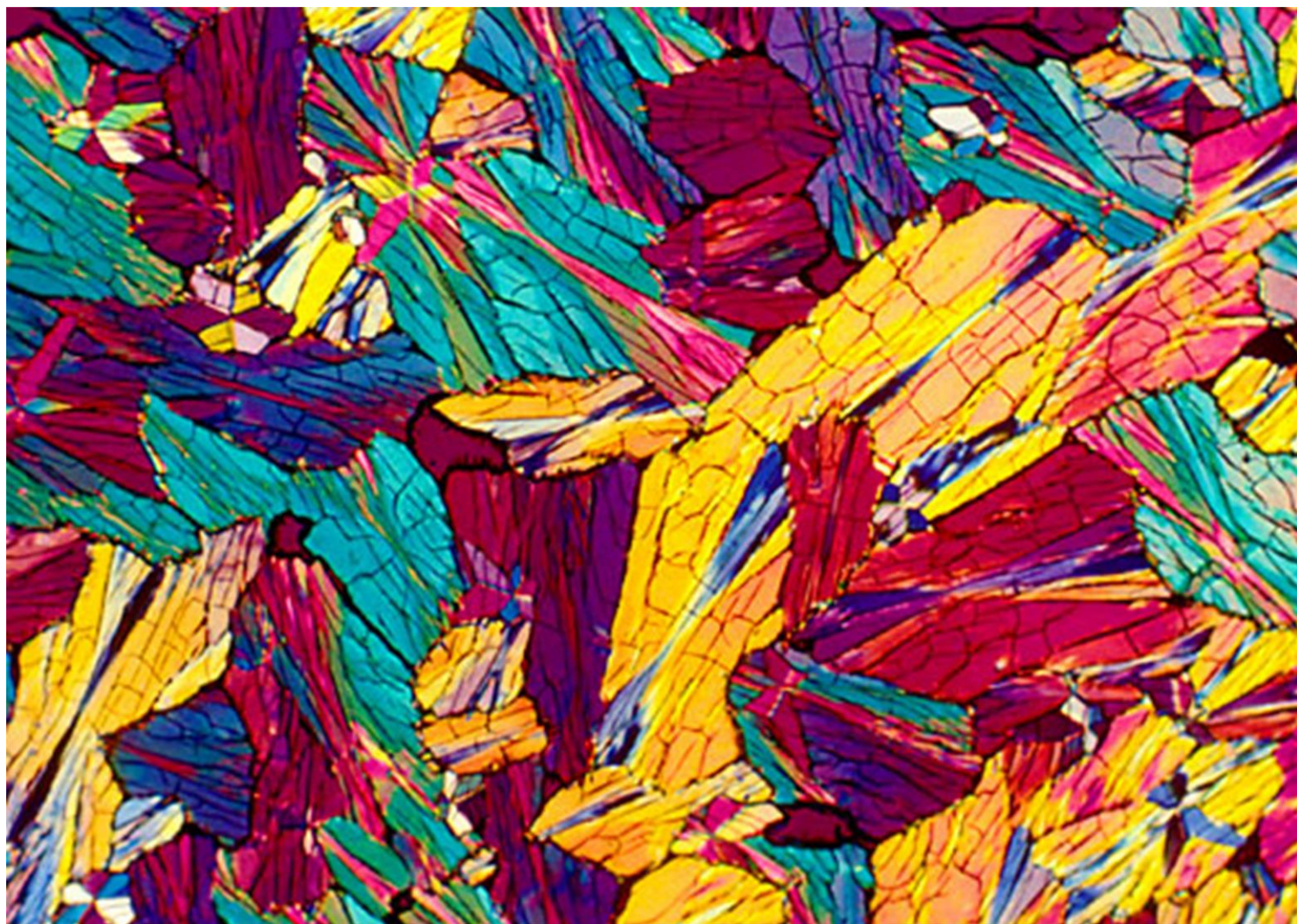




Mudd

IN
YOUR
EYE



Fall 2017 Newsletter

No. 47

LEHIGH
UNIVERSITY

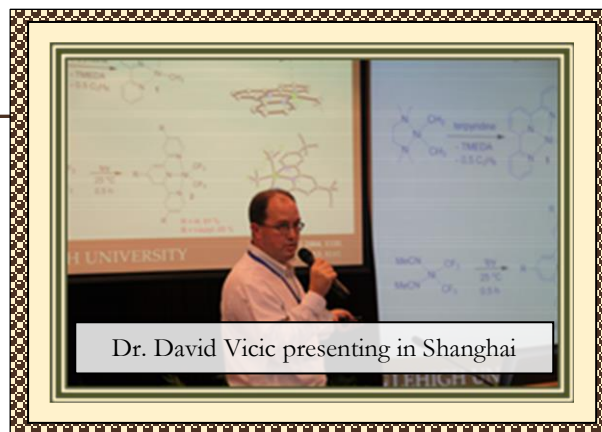
Department of
CHEMISTRY

From the Department Head

It is nice to see many new faces in the Chemistry Department as Lehigh University begins its 151st academic year.

Mary Roberson began as academic coordinator this summer, and she has started off strong by crafting this newsletter. Mary is enthusiastic about gathering information and sharing it with all of you, so please keep her apprised of your latest news to share with fellow colleagues and alumni at (mwr217@lehigh.edu or inchem@lehigh.edu). Bob Syvret and Electronic Fluorocarbons has begun an industrial liaison program with the Department, and we look forward to developing a strong and lasting partnership. We are also very pleased to welcome Elizabeth Young, who begins her career at Lehigh as an Assistant Professor. Her group specializes in understanding charge transfer and how it relates to biological systems and systems of interest to organic photovoltaics. Elizabeth comes to us from Amherst College where she got her research program off to a fast start. Finally, we welcome eleven new graduate students who will bring a wealth of enthusiasm for furthering the scientific enterprise of the Chemistry.

I am also very pleased to provide a progress report on our efforts to enhance research infrastructure in the Department. In 2015 our 300 MHz solid state NMR magnet quenched. The NMR instruments are vital to our research and training efforts, and they are tied to a great deal of indirect cost return from grants. It was vital that we rebuild the facility. In 2016 the Department purchased a new 400 MHz NMR replacement that can perform both solid state and multinuclear solution experiments. The new instrument came with a shielded magnet that helps keep helium costs low, and researchers noted that the spectra obtained with the new 400 MHz instrument were better than that obtained with the higher field 500 MHz instrument having an older console. In 2017, Professor Jebrell Glover (PI) spearheaded an effort with Damien



Thévenin and Bryan Berger (co-PIs) to modernize the out-of-date 500 MHz instrument. We are excited that their proposal for the highly competitive NSF MRI competition was funded (\$471k from NSF and ~\$159k from Lehigh cost-share). The new upgrade will make our 500 MHz instrument suitable for biomolecule experimentation and will feature an ultra-sensitive cryoprobe. The NMR facility is now better than ever, and we can focus on developing other capabilities that will enable and strengthen state-of-the-art science in our department.

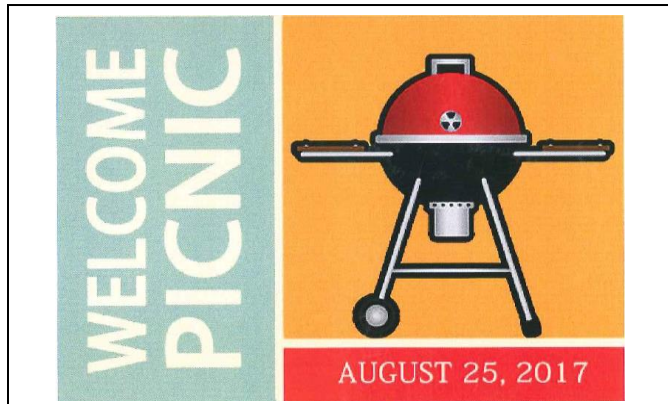
Finally, increasing our visibility and reputation among peers is one of our priorities. We are improving our website as a gateway to the world. We are bringing in high-profile speakers for our seminar series. Our faculty are presenting at top national and international conferences. We have brought on board many outstanding Assistant Professors who are performing groundbreaking work and are publishing in top journals. You can read all about the exciting efforts of our faculty in this issue of the newsletter. We are building upon this success and performing a search for a computational chemist this fall in order to broaden our expertise in that area. I am enthusiastic about the changes taking place, and I encourage you to visit the Department to see many of the new transformations. I am looking forward to hearing from you and welcoming you in person.

In This Issue

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On the cover: A remarkable magnification of the herbicide Atrazine—a member of the symmetrical triazine class of pesticides from the Florida State University National High Magnetic Field Laboratory.

Chemistry Department Welcome



On a beautiful, late-summer Pennsylvania day, a crowd gathered in a sunny field in the Pennsylvania highlands. No . . . it wasn't a repeat of Woodstock '69. . . or even the Pocono Rock Fest '72. It was, instead, a gathering of talented, enthusiastic and hungry Chemistry Department faculty, staff and graduate students who had gathered to launch the start of the 2017-2018 academic year.

With a mixture of seasoned to "new-to-Lehigh" faculty, long-term to beginner staffers, and graduate students running the gamut from several years' experience to "new-on-campus" Lehigh University students (some of whom traveled from across the globe) the **2017 Chemistry Department Welcome Picnic** was a huge success.

Implemented by the Dr. Jebrell Glover, the GAAC, and Graduate Coordinator Jennifer Cummings, the planning for the picnic began many months earlier when the discussion turned to the best way for the entire department to meet all of the new graduate students (and vice versa) before the hectic schedule of the academic year began. Held at the beautiful South Mountain Park at lunchtime on Friday, August 25, the weather cooperated and permitted the preparation of a delicious picnic luncheon of hamburgers and hot dogs and topped off by a "Welcome" sheet cake that was a perfect ending to a fun afternoon

The students were able to put "names" with "faces" and the conversations veered from the best places to get used textbooks and late-night meals--to how to juggle study/lab/teaching duties/personal time. Each of the new students were introduced with a brief intro and personal bio of where they had journeyed from—and one sentence sharing something that made them a "unique" Lehigh addition.



Gathered around the table enjoying the chow are (left to right) Lucie Loftus, Lauren Rusiloski, Craig Pointer, Nick Boekell and Ryan Charlton

While waiting for Chef Chen to complete the grilling, the students shared some friendly competition and got to know a bit more about each other in games of corn hole, soccer and Frisbee golf.



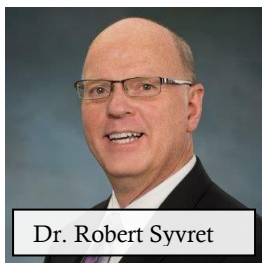
After spending time in the sun, the faculty, staff and students were happy to gather in the pavilion to get caught up on the latest news and finalize plans for the launch of another successful year



Chef Mark Chen grills hotdogs and hamburgers with "supervision" from (left to right) Grad student Siqi Yu, Lab Manager Aliana Lungu and Chair David Vici



Spotlight on Research



Dr. Robert Syvret

As announced on the College of Arts and Sciences online news update, Lehigh University has accepted Electronic Fluorocarbons (EFC) for participation in the Industrial Liaison program at the Lehigh Chemistry Department. In addition, the University has appointed EFC's Chief Scientist, Dr. Robert Syvret, as a University Research Fellow.

“We are grateful to Lehigh . . . and anticipate a fruitful collaboration between our research staff and the staff and students of Lehigh.”

The Industrial Liaison program gives industry members access to the University's laboratories and other support services, and encourages scientific interactions between the University staff and students and the industrial participant.

As part of this program, EFC will occupy a research laboratory in the Chemistry Department and have access to the University's analytical equipment to support the fundamental science behind EFC's development of new materials, including rare and electronic specialty gases, using advanced fluorine chemistry and purification techniques.

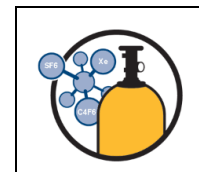
EFC is taking a leadership role in the development, chemical synthesis and commercial manufacturing of new materials, with an emphasis on electronics applications.

Electronic Fluorocarbons offers the latest technology for purification and analysis of specialty and rare gases for the medical, electronics, and semiconductor manufacturing industries, among others.

“We are grateful to Lehigh for admitting EFC to the Industrial Liaison program and are anticipating a fruitful collaboration between our research staff and the staff and students of Lehigh” says Syvret. Recently named a Fellow of the American Chemical Society, Syvret has over 75 patents, publications and conference presentations and 30+ years of experience in industrial fluorine chemistry. Dr. Syvret has already brought CTO's from Wonik through the Department to show them our facilities. Wonik is a major supplier to Samsung.

For more information about Electronic Fluorocarbons and its products, call 1-888-924-3371 or email sales@efgases.com.

To read more, visit the Lehigh University Chemistry Department website at:
<https://chemistry.cas2.lehigh.edu>



Welcome New Faculty



Dr. Liz Young

The Chemistry Department welcomes **Dr. Elizabeth Young** as Assistant Professor of Chemistry. A native of Macungie, Pennsylvania, Dr. Young received her B.S. in Chemistry (with a minor in German) from Haverford College. After spending a year abroad in Germany, she returned to the U.S. to begin her graduate work at the Massachusetts Institute of Technology in the laboratory of Daniel G. Nocera where she conducted research regarding proton-coupled electron transfer in model systems utilizing electrochemistry and both steady-state and time-resolved spectroscopies. After completing her Ph.D., she received an NSF American Competitiveness in Chemistry Fellowship to sponsor her postdoctoral work with Vladimir Bulovic in the Electrical Engineering and Computer Science Department at MIT. During her postdoc, she learned solid state device fabrication and gained insight about how engineers design organic solar cells.

In 2011, Dr. Young joined the Amherst College Chemistry Department as an Assistant Professor. Her research involves investigations of photo-induced proton-coupled electron transfer reactions in model systems and studies of charge transfer dynamics in molecules and materials of interest for next generation photovoltaics. Her work has been funded by the National Science Foundation as well as the American Chemical Society Petroleum Research Fund. At Lehigh she will establish an experimental physical chemistry laboratory that will include a laser facility for ultrafast transient absorption spectroscopy.

Faculty News

Mark Chen's lab group has recently finished synthesizing and characterizing their first series of molecular biradicaloids by using an aromatic carbenoid C-H insertion strategy pioneered by graduate student Caleb Wehrmann. Keep an eye out for this publication coming soon. In May 2017, the group also had two recent graduates: Kayla Jang (B.S. in Pharmaceutical Chemistry) and Michael Kerner (Master's in Chemistry).

Greg Ferguson and his group are excited about results published/submitted in three papers from their labs in 2017. The first describes an advance in the surface chemistry of Si/SiO₂:

•Ferguson, G.S. and Lee, M. "Stepwise Synthesis of a Well-Defined Silicon (Oxide)/Polyimide Interface" *Langmuir* **2017**, *33*, 1639-1645.

The second confirms their discovery of a phenomenon called "cathodic silence":

•Ferguson, G.S. and Giron, R.P. "Confirmation of Cathodic Silence in an Anodic Oxide Gold" *J. Electrochem. Soc.* **2017**, *164*, H635-H638.

The paper on silicon surface chemistry presents a new synthetic approach with the unique feature of producing no byproducts, thereby avoiding a potential source of contamination on the semiconductor surface. It shares this characteristic with additive manufacturing, which has recently become popular with the advent of affordable 3D-printing.

The second paper describes the use of electrochemical quartz-crystal microgravimetry (EQCM) to demonstrate that a standard electrochemical technique (linear-sweep voltammetry) does not provide a reliable measure of the amount of oxide present during in the open-circuit decomposition of a gold-oxide film on a gold electrode. Analytical methods underlie all of experimental chemistry, so learning the limits of their reliability addresses a fundamental need in the field. In addition, the group has recently submitted one other paper for publication, a computational study of hydrogen bonding.

Robert Flowers gave two invited lectures at the recent Mid Atlantic Regional Meeting of the ACS entitled: "Mechanistic Studies of Low-Valent Samarium Reductants" and "Mechanistic Study and Development of Catalytic Electron Transfer Reactions". He also presented an invited lecture at the 28th Rare Earth Research Conference entitled: "Follow the Thread: Unraveling the Mechanism of Substrate Reduction by Sm(II)-Water Complexes". He also gave an invited seminar at the University of Ottawa: "Unraveling the Mechanism of Electron Transfer in Reactions of Samarium(II)-based Reductants".

His group published the following paper this spring:

• Chiuck, T. V.; Li, A. M.; Vazquez-Lopez, A.; Anderson, W.R. and Flowers, R.A. II "Secondary Amides as Hydrogen Atom Transfer Promoters for Reactions of Samarium Diodide" *Org. Lett.* **2017**, *19*, 290-293.



Dr. Flowers received the Hillman Award for Excellence in Graduate Advising and was recognized at the Annual Faculty and Staff Awards dinner by (left) President John Simon and (right) Provost

Patrick Farrell. The award recognizes exemplary student advising and assisting students in the development and completion of research related to their degree program.

The University reserves this award for those who have distinguished themselves through long-term excellence or service to the institution. In nominating Flowers, his students noted that despite numerous responsibilities, he unfailingly supports, guides and makes himself available to them. He helps his students see the big picture importance of their efforts and models the highest levels of ethical responsibility.

Jebrell Glover has been awarded the Class of '61 Professorship. This highly competitive Professorship recognizes faculty who have received the rank of associate professor and have shown excellence in teaching, research and service.

He also received the Eleanor and Joseph F. Libsch Early Career Research Award, honoring a faculty member or members early in their research career demonstrating the potential for high-quality research and scholarship.

Faculty News

Members of the Glover Lab attended the Gordon Research Conference on Membrane Protein Folding At Stonehill College in Massachusetts. Sarah Plucinsky presented a poster entitled "Biophysical characterization of caveolin-1".

The group published a review in the Journal of rare diseases research and treatment entitled "The C-terminal domain of caveolin-1 and pulmonary arterial hypertension: An emerging relationship". Lucie Loftus attended the ACS Mid-Atlantic regional meeting in Hershey, Pennsylvania.

Former Glover lab member Kyle Root accepted a tenure track position at Lock Haven University. Former lab member Monica Rieth (Ph.D.) accepted a visiting professorship at Southern Illinois University in Edwardsville.

Ned Heindel In addition to the patent reported in our Spring 2016 newsletter, Dr. Heindel's research group has recently been issued two more patents and one published provisional patent for their work in new pharmaceutical development.

The patents are "Augmenting Moieties for Anti-Inflammatory Compounds," U.S. Patent 9,512,068 (2016); and "Vanilloid Fatty Hydroxamates as Anti-inflammatory Pharmaceuticals," U.S. Patent 9,422,233 (2016). A provisional patent "Unique Dual-Action Therapeutics," 2017-0143836 was published 25 May 2017. The co-inventors on these disclosures are C. Jeffrey Lacey, Sherri Young, Robert D. Rapp, and Christophe Guillon.

Kai Landskron's Postdoctoral Research Associate Shan Zhu joined the lab in July. Postdoctoral Research Associate Swapn Das will also be joining in September. In the spring, the Landskron group published the following papers:

•Liu, C. and Landskron, K. "Design, Construction, and Testing of a Supercapacitive Swing Adsorption Module for CO₂ Separation" *Chemical Communications* **2017**, 53, 3661-3664.

•Mandal, M.; Liu, C.; Sanders, T.; Haso, F.; Bhadram, V.; Arslan, I.; Liu, T.; Fei, Y. and Landskron, K. "Periodic Mesoporous Hexagonal Boron Nitride at High Pressure: A Route to Cubic Boron Nitride Nanocrystals and Mesoporous Cubic Boron Nitride" *ChemistrySelect* **2017**, 2, 740-744.

•Sanders, T.; Gelb, A.; Platte, R.B.; Arslan, I. and Landskron, K. "Recovering Fine Details from Under-Resolved Electron Tomography Data Using Higher Order Total Variation l(1) Regularization" *Ultramicroscopy* **2017**, 174, 97-105.

Dr. Landskron also received a new grant from the DOE Office of Basic Science. The title is: "Porous Weakly Coordinating Anionic Frameworks".

Marcos Pires' Laboratory synthesized analogs of cell walls and established that they are tolerated by bacteria, which provided an efficient way to graft handles on bacterial cell surfaces. With these concepts defined, they showed that this mode of grafting antigens onto bacterial cell surfaces was superior to their original concept. Their work was published in 2016 in the journal *ACS Infectious Diseases* without a request for any further revisions. The editor-in-chief invited their work to be highlighted as the journal cover to bring higher visibility to this emerging and novel modality of fighting bacterial infections.

Their research team has also described chemical probes that label bacterial cell walls of live organisms to report on structural alterations linked with antibiotic resistance. The improper use of vancomycin has directly led to the rise in Vancomycin Resistant Enterococci (VRE). VRE cells gain resistance to vancomycin by synthesizing altered cell wall building blocks. Although structurally subtle, the changes to the cell wall result in 1000-fold weaker binding affinity to vancomycin. The drug-resistant phenotype specific to vancomycin requires the function of two primary genes. The product on one of the genes is responsible for degrading drug-sensitive cell wall building blocks. Both of these enzymatic functions are necessary for VRE. In 2017, they published successive articles in

ACS Chemical Biology and *Angewandte Chemie*, which disclosed their specific probes to each pathway. Their work was also selected and highlighted by *C&EN* magazine in June 2017.

Dr. Pires presented invited talks at NIH-Chemical Biology Laboratory, Temple University, New York University, Kutztown University, Drew University, North Carolina State University, and Johns Hopkins.

Additionally, he presented his work at five conferences: "Frontiers at the Chemistry-Biology Interface" Symposium at the University of Delaware; Lehigh University Workshop-"Taking Aim at

Faculty News

Bacteria”; New York Academy of Science-“Emerging Paradigms in Chemical Biology”; National Meeting of the American Chemical Society in Philadelphia and at the Protein Society National Meeting in Montreal.

His research group had the following publications:

•Fura, J.; Pidgeon, S.; Birabaharan, M. and Pires, M. “Dipeptide-Based Metabolic Labeling of Bacterial Cells for Endogenous Antibody Recruitment” *ACS Infectious Diseases* **2016**, 2, 302-309. (Chosen as the cover).

•Yu, Y.; Sabulski, M.; Schell, W.; Pires, M.; Perfect, J. and Regen, S. “Simple Strategy for Taming Membrane-Disrupting Antibiotics” *Bioconjugate Chemistry* **2016**, 27, 2850-2853. (Highlighted by *Chemical & Engineering News*).

•Fura, J.; Sarkar, S.; Pidgeon, S. and Pires, M. “Combatting Bacterial Pathogens with Immunomodulation and Infection Tolerance Strategies” *Current Topics in Medicinal Chemistry* **2017**, 17, 290-304.

•Pidgeon, S. and Pires, M. “Cell Wall Remodeling by a Synthetic Analog Reveals Metabolic Adaptation in Vancomycin Resistant Enterococci” *Angewandte Chemie Int. Engl.* **2017**, in press (Highlighted by *Chemical & Engineering News*).

•Pidgeon, S. and Pires, M. “Vancomycin-dependent Response in Live Drug-Resistant Bacteria via Metabolic Labeling” *ACS Chemical Biology* **2017**, in press (Highlighted by *Chemical & Engineering News*).

Steve Regen and his group published the following materials:

•Wang, C.; Yu, Y. and Regen, S.L. “Lipid Raft Formation: Key Role of Polyunsaturated Phospholipids” *Angew. Chem. Int. Ed.* **2017**, 56, 1639-1642.

•Lin, C.; Stedronsky, E. and Regen, S. L. “pKa-Dependent Facilitated Transport of CO₂ Across Hyperthin Polyelectrolyte Multilayers” *ACS Appl. Mater. Interfaces*, **2017** 9, 19525-19528.

In addition, Dr. Regen’s Department of Energy project, “Hyperthin Membranes for Gas Separations” has been renewed through June 14, 2020.

Jim Roberts was recognized for excellence in service and advising when the college hosted its annual faculty awards dinner on March 30. David Vicic, who nominated Jim for the award, notes: “Jim has gone above and beyond in the realm of service. He filled in when we were searching for our new Director of Instrumentation, he plays a lead role in safety in the department, and he single-handedly directed the network re-cabling of the Mudd Building.”

Dr. Roberts, associate professor and vice chair of chemistry, also serves as sole Head Usher and has served as head liaison with the University’s technology services. At the college level, he serves as an advising mentor and is a member of Alpha Chi Sigma, the Lehigh Philharmonic Orchestra and as a Scoutmaster for a local Boy Scout troop.

Damien Thévenin was invited to speak at the Cancer Research Center of Toulouse (Toulouse, France), the Center for Cancer Research at the National Cancer Institute in Frederick, MD, and the Department of Chemistry, Binghamton University, State University of New York (Binghamton, NY).

Dmitri Vezenov’s group has reported findings on interactions in soft matter systems in two papers:

•Selivanova, N.M.; Sautina, N.V.; Vezenov, D.V.; Stoyanov, O. V. and Galyametdinov, Y.G. “Evaluation of Interactions Between Liquid Crystal Films and Silane Monolayers by Atomic Force Microscopy” *Journal of Molecular Liquids* **2017**, 230, 574-578.

•Starostina, I.A.; Sautina, N.V.; Nguen, D.A.; Galyametdinov, Y.G.; Stoyanov, O.V. and Vezenov, D.V. “Prospects of the Evaluation of Adhesive Interaction Via Chemical Force Microscopy” *Polymer Science (Series D)* **2017**, 10-2, 111-114.

David Vicic gave invited lectures at the University of Ottawa and at Juniata College. He was also an invited speaker at the ACS National Meeting in San Francisco, the Mid-Atlantic Regional Meeting of the ACS held in Hershey, and the International Symposium on Fluorous Technologies held at Tufts University. Two members of the Vicic lab--Long Xu and Peter Kaplan--defended their Ph.D. dissertations in 2017. Long is currently working as a postdoc in the labs of Nobel Laureate Barry Sharpless. Peter is beginning a position in industry at Croda.

Faculty News

The Vicic group has published/submitted the following papers:

- McGarry, K.R. and Vicic, D.A. "A Perfluorometallacycloheptane Complex of Nickel Bipyridine" *J. Fluorine Chem.* **2017**, *in press and online*.
- Han, J.B.; Dong, T.; Vicic, D.A. and Zhang, C.P. "Nickel-Catalyzed Trifluoromethylselenolation of Aryl Halides Using the Readily Available [Me₄N][SeCF₃] Salt" *Org. Lett.* **2017**, *19*, 3919-3922.
- Kaplan, P.T.; Lloyd, J.A.; Chin, M.T. and Vicic, D.A. "Comparative Profiling of Well-Defined Copper Catalysts and Precatalysts for the Trifluoromethylation of Aryl Iodides" **2017**, *submitted*.

On March 29, 2017, Professor Vicic and Peter Kaplan performed chemistry demos for a fourth grade class at Moravian Academy. The scene was well-documented in this thank you letter from a student.

The thank you card read: "*Dear Dr. Vicic and Peter, Thank you for coming to our class and doing some fun experiments. I enjoyed watching them and hearing the sound effects that came with the experiments. You are very inspiring to kids that love science, chemistry, and blowing things up.*"



Xiaoji (George) Xu

Dr. Xu's group has published the following papers:

- Wang, L.; Huang, D.; Chan, C.K.; Yong, J.L. and Xu, X. G. "Nanoscale Spectroscopic and Mechanical Characterization of Individual Aerosol Particles Using Peak Force Infrared Microscopy" *Chemical Communications* **2017**, *53*, 7397.
- Wang, L.; Wang, H.; Wagner, M.; Yan, Y.; Jakob, D.; and Xu, X. G. "Nanoscale Simultaneous Chemical and Mechanical Imaging Via Peak Force Infrared Microscopy" *Science Advances*, **2017** *3*, e1700255
- Wang, H.; Wang, L.; Jakob, D. and Xu, X. G. "Mapping Three-Dimensional Near-Field Responses With

Reconstruction Scattering-Type Scanning Near-Field Optical Microscopy" *AIP Advances* **2017**, *7*, 055118.

Dr. Xu has been featured in the ChemComm Engineering Investigators 2017 Issue as one of 57 emerging investigators around the world.

Professors of Practice

Rebecca Miller and Andy Ho received the Faculty Recognition Award sponsored by the Office of Academic Support Services and the Peer Mentors Student Leadership Program at Lehigh in spring 2017. Two faculty members from each college are selected each year in recognition of their commitment to educating all students. Drs. Miller and Ho were selected for their willingness to work individually with students and/or the use of Universal Design for Learning with an intentional multi-faceted approach to teaching that engages students' learning styles.

Along with General Chemistry Lab Manager **Denise Beautreau**, Drs. Ho and Miller also taught a preparatory chemistry course in the Lehigh University Student Scholars Institute (LUSSI) this summer. The program starts with a three-week intensive college preparatory experience designed for incoming first-year students who identify as first generation and/or low income. These students work closely with faculty instructors as they attend classes and work on projects and research opportunities that expose them to the academic rigors and culture of Lehigh. This is the third summer our team taught the prep chemistry course in the program.

FALL 2017 FACULTY SEMINAR SERIES

| DATE | SPEAKER | AFFILIATION |
|--------------|-------------------|---------------------------------|
| August 30 | Nancy Allbritton | University of North Carolina |
| September 6 | Michael Freund | Florida Institute of Technology |
| September 13 | Neil Vasdev | Harvard Medical School |
| September 20 | David Lawrence | University of North Carolina |
| September 27 | Zahra Fakhraai | University of Pennsylvania |
| November 1 | Jeanne Stachowiak | University of Texas |
| November 15 | Howard Hang | The Rockefeller University |
| November 29 | Lauren Wolf | American Chemical Society |

All seminars begin at 4:10 p.m. in Neville 3

Departmental News

Our deepest thanks to **Dr. William Schiesser**, Professor Emeritus in the Department of Chemical Engineering for the donation of this antique (c. 1920's) Christian Becker apothecary/analytical, semi-micro scale in a glass-enclosed polished maple cabinet with a black glass base. This is a very rare scale which sets on three legs, and has a bubble for making it perfectly level. It is a treasure of pure craftsmanship.

The scale will be on view and securely housed in the Chemistry Department display case in the lobby of the STEPS building.

Dr. Schiesser is the R.L. McCann Professor Emeritus of Engineering and Mathematics. He continues to make critical contributions to the field of biomedical engineering.

See more about Dr. Schiesser's contributions to the Lehigh University community at the [Lehigh University News Center](#)



The Total Eclipse at Lehigh



On Monday, August 21, a group of faculty, staff and students gathered in the plaza behind the Seeley G. Mudd Building to watch the first total eclipse of the sun in the northern hemisphere since 1979. With safety glasses, shields and lenses safely in place, the group watched in fascination as the moon slowly but inexorably obscured the sun. Although only a 75% eclipse in our area, the process of watching this rare occurrence was both awe-inspiring and humbling.



Welcome New Staff



Our new Faculty Coordinator, **Mary Roberson** comes to us most recently from Chesapeake, Virginia. Originally from northeast Ohio, Mary has a broad background in a myriad of industries including manufacturing, healthcare, insurance, education and public service sectors. With a BA in Business Management and an MIS in Information Studies, she has gained experience in both gathering and presenting information in ways that provide effective communication. She lives in Hampton, New Jersey with her husband--and is a fledgling empty-nester with two sons on the cusp of graduation from colleges in New Jersey and Virginia.

IN MEMORIAM



Dawne Kressler, Department of Chemistry secretary for 20 years, passed away June 14, 2017 in Quakertown, PA, at the age of 81. She first served as secretary to the Chair, Dr. Fred Fowkes, in the 1970's – as in the 1980's as the secretary to the Fowkes Research Group. Those who encountered Dawne remember her laughter and fun-loving spirit.

After leaving Lehigh, Ms. Kressler was employed by the Saucon Valley Country Club as part of the vibrant team that helped produce the 1992 USGA Senior Open.

UNDERGRADUATE STUDENT AWARDS - 2017

American Chemical Society Award presented to the outstanding senior major in chemistry: **Jessica Lloyd**

American Institute of Chemist's Award for an outstanding senior majoring in chemistry or biochemistry: **Alexis Apostolos**

ACS Inorganic Chemistry Award to an outstanding senior in inorganic chemistry: **Jessica Lloyd**

ACS Organic Chemistry Award for the outstanding seniors in organic chemistry: **Kayla Jang**

Alpha A. Diefenderfer Analytical Award presented to the highest ranking junior in analytical chemistry, sponsored by the ACS Division of Analytical Chemistry: **Evan Pretti**

Biochemistry Award given to the highest-ranking junior or senior biochemistry major: **Alexandra Mease**

Harry M. Ullmann Chemistry Prize which is awarded to the highest-ranking senior in chemistry: **Kayla Jang**

Hypercube Scholar Award is given to a senior chemistry major who has shown outstanding promise in theoretical chemistry and molecular modeling: **Jennifer Schlegal**

Merck Index Award presented to an outstanding senior in Chemistry who has been active in student society affairs, and who, in the judgement of faculty of the chemistry department, has promise of a successful career in chemistry: **Mariel Flanagan**

William H. Chandler Senior Prize, established in 1920 by Mrs. Chandler, presented to the highest-ranking senior in the chemistry department: **Alexis Apostolos**

William H. Chandler Junior Prize presented to the highest-ranking junior in the chemistry department: **Julia Nelson**

William H. Chandler Sophomore Prize presented to the highest-ranking sophomore in the chemistry department: **Guanwei Zhou**

Congratulations to the winner of the **Frederick Fowkes Scholarship** which is awarded based on the student's GPA: **Weng Si Chan**

Le Wang – Xu Group

GRADUATE STUDENT AWARDS

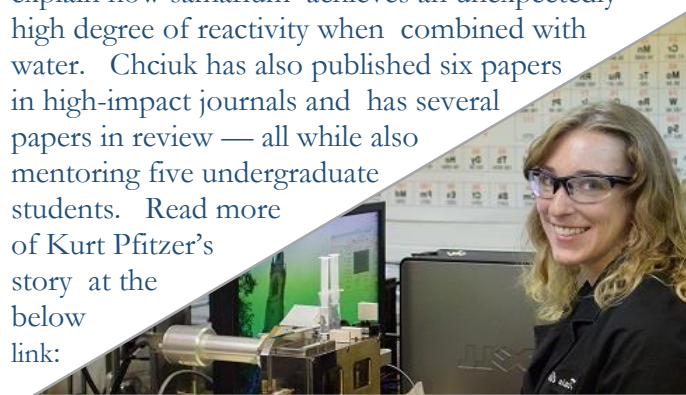
Tesia Chciuk, is the recipient of the prestigious **Anna Louise Hoffman Award**. She has become the first Lehigh student to receive the award from Iota Sigma Pi, the National Honor Society for Women in Chemistry for outstanding achievement in graduate research. The award is given annually to one graduate student in the United States.

As an undergraduate, Chciuk (pronounced "Chuck") was awarded a patent and has several patents pending relating to her work for Eos Energy Storage from 2009-2012.

In her five years at Lehigh (2012-2017) Chciuk conducted research into samarium (Sm), a Rare Earth element and number 62 on the Periodic Table.

She and her advisor, Bob Flowers, were the first to explain how samarium achieves an unexpectedly high degree of reactivity when combined with water. Chciuk has also published six papers in high-impact journals and has several papers in review — all while also mentoring five undergraduate students. Read more of Kurt Pfitzer's story at the below link:

<https://www1.lehigh.edu/news/versatile-chemist-rises-top>



FELLOWSHIP RECIPIENTS 2017-2018

Chemistry Student Fellowship

Chang Wang – Regen Group

Buch Fellowship

Le Wang – Xu Group

College of Arts and Sciences Summer 2017 Research Fellowship

Siqi Yu – Vicic Group

Honor Fellowship

Caleb Wehrmann – Chen Group

NEW ALUMNI – CLASS OF 2017

Ph.D Graduates 2017

Tesia Chciuk (Flowers Group) “The Role of Additive and Solvent Coordination in Sm(II) Reactions”. She is now working as a Research Fellow in the Flowers Group and as the Scientific Research Director at Bethlehem Apparatus Company in Bethlehem, PA.

Jonathan Fura (Pires Group) “Development of an Immunomodulation Strategy to Combat Pathogenic Bacteria” He is now working as an Entrepreneurial Scientist for Avantor Performance Materials in Center Valley, PA.

Michael Goodrich (Xu Group) “Matrix-Isolation Studies of Ionic CO₂ Clusters and Improvements on the Counter Ion Co-Deposition Technique”

Peter Kaplan (Vicic Group) “Metal-Based Approaches for the Fluoroalkylation of Aryl Halides”. Peter will be working as a Research Scientist at Croda Atlas Point in New Castle, Delaware.

Cong Liu (Landskron Group) “Nanoporous Materials Chemistry: From Gas Separation to High Pressure Chemistry”. Cong has accepted a position at Axalta Coating Systems.

Mary Sabulski (Pires Group) “Development of Immunotherapy Strategies: Targeting Gram-positive and Gram-negative Pathogenic Bacteria”. Mary will be working with Dr. Camila Dos Santos at Cold Spring Harbor in New York.

Long Xu (Vicic Group) “Advances in Metal-Catalyzed Difluoromethylation and Polydifluoromethylation Reactions”. Long has accepted a Postdoc position with Nobel Laureate Barry Sharpless at his labs at the Shanghai Institute of Organic Chemistry.

Master’s Graduates 2017

Cara Blakenbicker
Jignesh Darji
Myles Donegan
Philip Eempio
Jessie Friga
Michael Kerner

Kiran Khadka
Sophie Miotto
Kelcie Molchany
Luis Reyes
Brian Volk
Lindsey Whitecotton

Bachelor’s Graduates 2017

BA Chemistry: Candra Doron

BS Chemsitry: Mariel Flanagan, Christopher Gardineer

BS Pharmaceutical Chemistry: Elyssa Hanson, Kayla Jang, Alexander Kaplitz, Jin Park

BS-College of Engineering-Chemisty: Kayla Lash, Jessica Lloyd

BS Biochemistry: Alexis Apostolos, Gabrielle Dardis, Marina Grossi, Daniel Liberta, Jennifer Schlegel, Adam Shaw, Joshua Spair, Duyen Tran, Mack Trexler

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Lehigh Chemistry alums can be found all across the globe making their degrees work for them. Your Lehigh Department of Chemistry would like to stay in touch. We love hearing about where your degree has taken you! Send your success stories, professional or personal, throughout the year to mwr217@lehigh.edu



WELCOME NEW GRADUATE STUDENTS



| NAME | HOME STATE/COUNTRY | MATRICULATING FROM |
|--------------------|--------------------|-------------------------------------|
| Nick Bokell | Pennsylvania | Trinity College (Connecticut) |
| Jennie Cawley | Pennsylvania | DeSales University |
| Brianna Dalesandro | Pennsylvania | DeSales University |
| Muhammad Imran | Pakistan | University of Eng'g & Tech. -Lahore |
| Jeffrey Julien | New York | DeSales University |
| Jiajie Li | China | Minzu University - China |
| Shea Martin | Pennsylvania | Delaware Valley University |
| Craig Pointer | Pennsylvania | Kutztown University |
| Lauren Rusiloski | Pennsylvania | Delaware Valley University |
| Chengshuo Tian | China | Jilin Univeristy |
| Teng Xue | China | Shanghai University |

Getting to Know You . . . Grad Student Spotlight

Elizabeth “Betty” Bloch

Home State: New York

Undergrad: Middlebury College, Middlebury, VT

Research Group: The Thévenin Research Lab

Research Interest: Elucidating the function of the transmembrane region in the activity and regulation of receptor protein tyrosine phosphatases, as it is known to play a causative role in cancer.

What lead you to Lehigh University?

I wanted to be a part of a small, tight-knit community that focuses more on things like collaboration and encouragement than just competition. I also enjoy the multidisciplinary approach most labs have towards their research in our department.

What have you found to be the biggest surprise about Lehigh and/or the Bethlehem area?

I was surprised to find all the various activities available for me in this area, ranging from festivals and breweries to amazing hikes on the Appalachian Trail.



What was the last book you read for pleasure?

“The Handmaid’s Tale” by Margaret Atwood

What’s your “go-to” graduate student food?

Italian hoagie from Goosey Gander

Name a fun place in Bethlehem that people might not know about.

The Lehigh cross country course and sports fields on Goodman campus are a great place to run and play games with friends.

If you could give one piece of advice to future Chemistry grad students . . .?

Visit all the labs you are interested in and talk to/shadow the graduate students in those labs.

What are your current thoughts on where you want to go from Lehigh?

I’d like to move to Cambridge, Massachusetts and find either a postdoc position or a biotech research position.

'68 Steven Richheimer (PhD), has published his second book: *The Nonlocal Universe, Why Science Validates the Spiritual Worldview*. The book explores the scientific evidence that supports the idea that nonlocality in the physical and mental realms negates the materialistic worldview, but is entirely consistent with the spiritual worldview. In contrast to the materialistic worldview which can be called a "bottom-up" ontology because it starts with subatomic particles which build atoms, then molecules, then living organisms, then brain and mind and finally consciousness; the spiritual worldview is considered "top-down" because it begins and ends with consciousness. Consciousness is considered to be the ground substance of creation, which is transformed into the material world. The book is available in print or electronic versions at Amazon.com

'70 Michael E. Ford, (BS and PhD-East Anglia, UK) along with Lehigh University Chemical Engineering Professor Israel Wachs published "A Decade+ of Operando Spectroscopy" in the December 2016 issue of *Catalysis Today*. Michael retired from a career in catalyst research at Air Products and is currently a Research Scientist at Lehigh in Professor Wachs' laboratory.

'77 Joseph H. Dreisbach, (PhD and MS '74) was named Interim Provost and Senior Vice President for Academic Affairs at the University of Scranton. Dreisbach, who completed his Lehigh doctorate in biochemistry under Professor Joseph Merkel and was a Jesse Smith Noyes Foundation Fellow, joined the Scranton faculty in chemistry in 1978. He was promoted to the rank of professor in 1989 and served as director of the graduate programs in chemistry from 1988-1991 when he became department chair. He was promoted to dean of the College of Arts and Sciences in 1997, and associate provost in 2008. Joe, who has served the University of Scranton for almost four decades, was appointed to his present position in 2016 while the institution conducts a search for a provost.

His research area involves enzyme structure and function, and microbial metabolism of xenobiotic substances. He worked at the USAF Research and Development Laboratories, USAF Engineering and Services Center, Tyndall Air Force Base as a summer

faculty fellow in 1990 and 1991. His research has been supported, in part, by the USAF Office of Scientific Research. He has published and presented over 30 papers, many with undergraduate students, in various aspect of biochemistry and chemical education. His teaching interests include chemistry at the introductory level, biochemistry, microbial metabolism, pure and applied enzymology, and science and the human condition.

Dr. Dreisbach has served on numerous committees at The University of Scranton including the Middle States Commission on Higher Education Reaccreditation Self-Study Steering Committee, the Board on Rank and Tenure, The Faculty Development Board, the Institutional Review Board for the Protection of Human Subjects, and the Executive Committee of the Strategic Planning Committee. He is a member of the American Chemical Society, the American Society of Microbiology, Phi Lambda Upsilon, and Alpha Sigma Nu (the Jesuit honor society.)

'82 Gordon "Chip" Ziegler, III (BS-CHM) donated glassware from his company, Ziegler Chemical & Mineral Corporation, in central New Jersey. Although he had lost contact with the faculty he had known while a student at Lehigh, he contacted Department Chair David Vicic to inquire as to whether the Chemistry Department could make use of this wide variety of glassware.

Dr. Vicic was quick to accept this generous offer to benefit the department. Many thanks to Chip for offering this greatly appreciated and much needed influx of chemistry glassware.

'83 David Carrick (PhD) is a consultant in analytical and industrial chemistry with Libra Technical Center, Piscataway, NJ. Libra is an independent analytical, testing and development laboratory which provides official assays as well as unique analytic methods to corporate clients.

'87 Robert Outten, (PhD) has been named Senior Manager for Regulatory Affairs at Pfizer Pharmaceuticals. Bob works out of the Pfizer offices in Peapack, NY, and is responsible for the global Regulator CMC (Chemistry, Manufacturing, and Controls) aspects for several of Pfizer's established products.

'87 Barakat M. Shabsoug (PhD) recently published an article on "Chemical Analysis of Kidney Stones from Patients in Northern Jordan." Barakat's study appeared in the Journal of Applicable Chemistry, and identified six kinds of chemically distinct kidney stones ranging from the most common (40%) being mixed crystals of calcium oxalate and uric acid to the least common (4%) being crystalline cysteine. Barakat is Associate Professor of Chemistry in the Department of Chemistry at the Jordan University of Science and Technology, Irbid, Jordan.

'92 Marsha Miller (MS and PhD-UPenn) has been named Senior Director for Global Regulatory Affairs at Celgene Corp., Summit, NJ. Marsha was formerly Director of the Global Regulatory Team for Bristol Myers Squibb in Lawrenceville, NJ.

'01 Christine Martey-Ochola (PhD) is the co-founder of Avo Global Limited and has been awarded a contract to support the Math, Sciences, Technology and Health Division at Schenectady County Community College as a strategic consultant in the role of interim dean.

'07 Cozette M. McAvoy (MS) has recently relocated from a corporate general legal and patent position with Novartis Pharmaceuticals, Inc. to a position leading the Intellectual Property department at Amyris, Inc., an industrial bioscience company. Amyris is the integrated renewable products company that is enabling the world's leading brands to achieve sustainable growth. Amyris applies its innovative bioscience solutions to convert plant sugars into hydrocarbon molecules and produce specialty ingredients and consumer products across a number of markets, including specialty and performance chemicals, flavors and fragrances, cosmetics ingredients, pharmaceuticals, and nutraceuticals.

'15 Niki Patel (PhD) has just completed her postdoc residency in the Molander group at the University of Pennsylvania and has accepted a position as a Senior Scientist at Merck in the Process Chemistry Division.

'16 Kelly Burns King (PhD) is currently working as an NRC Postdoctoral Research Associate at the U. S. Naval Research Lab (Center for Bio/Molecular Science & Engineering).

IN MEMORIAM

Michael Paul Aronson (PhD '73) passed at the age of 69 in West Nyack, NY on June 8, 2015. Mike did his Lehigh doctorate in surface chemistry with a dissertation title of "The Properties of Certain Four Phase Configurations." He joined the R&D laboratories of Unilever in Edgewater, NJ, where he rapidly rose through the corporate ranks. He developed, patented and produced more than a dozen skin-hydrating/skin-softening cosmetic ointments. Mike successfully completed a law degree and passed the exam for admission to the patent bar. He functioned as a patent attorney for Unilever and for private clients. While at Unilever, Mike hired and mentored several Lehigh chemistry grads and arranged regular sponsorship by his company of the Chemistry Department's Summer Undergraduate Research Program.

Richard M. King (PhD '67) The Boston Globe newspaper reported the death of Richard M. King on January 29, 2017 just eight days shy of his 86th birthday. Richard was survived by a daughter, a son, and a stepson. Richard attained his PhD in Analytical Chemistry from Lehigh working with the late Professor A. James Diefenderfer on "Studies on the fluorescence of 2-hydroxy-3-naphthoic acid and related compounds." After obtaining his doctorate Richard joined the faculty of Ohio Wesleyan University where he rose to the rank of Professor before departing for industry. He became a staff scientist at Waters Associates in Milford, MA, and spent his corporate career in the research and development of new liquid and gas chromatographs.

Abdullah 'Assad' Nassry (MS '72) passed away on February 16, 2017 at the age of 82. Assad had immigrated to the US from Afghanistan as a young man and received his BS in Chemistry from Lafayette College. He immediately began a long career as an industrial chemist with General Aniline and Film Corp. (GAF) and later with Rohm and Haas, Texaco, and Shell Oil. Assad became an expert in the design and formulation of engine lubricants for use under extreme conditions such as Arctic, tropics, and sand-blown deserts. He completed his Lehigh MS in Chemistry as a part-time student commuting to campus for his classes from GAF's Labs in Easton. Assad worked until his late 70's at Shell Oil's labs in Houston, Texas when he and his wife, Kamar, retired to Bethlehem.



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Deanna Quay '94

John Stallings '52

Mary Butow '99

Julian Fasano '70

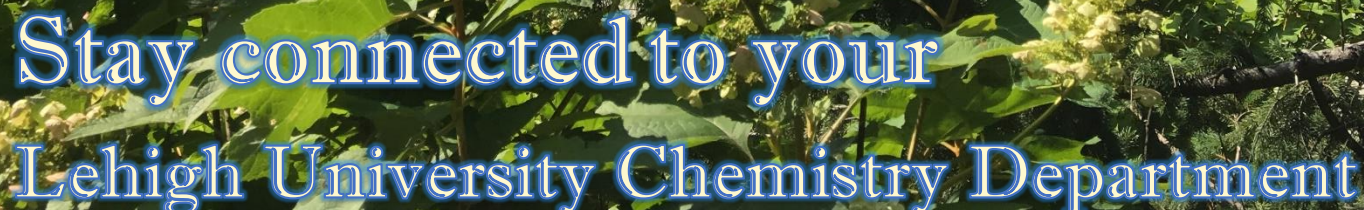
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Morris Kelsey '61

Katherine McGarry '16

Piercen Oliver '10

Elizabeth Upton '11



Stay connected to your Lehigh University Chemistry Department



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Please contact Department Chair David Vicic (dav512@lehigh.edu) if you are interested in funding specific projects.

The Chemistry Department has created an internet link so that monetary donations can be made hassle-free online at: <http://MyLehigh.Lehigh.Edu/ChemistryGifts>