Mudd In Your Eye

Newsletter of the Department of Chemistry, Lehigh University

Number 44 Fall 2015

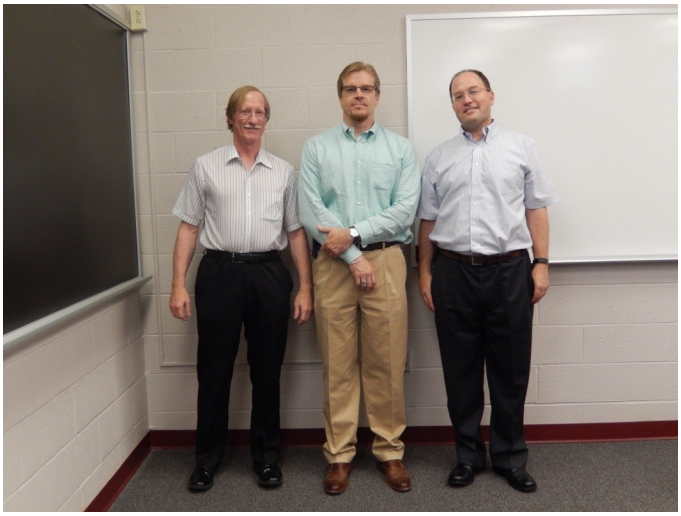
"Great importance is given to chemistry as an elementary branch of learning." — Lehigh Register 1866

75 year history of the Department of Chemistry

In October 2015, Lehigh University is celebrating its 150th year of existence. The first Board of Trustees Meeting was held on 27 July 1865. Faculty and student recruitment began later that fall, and the first formal classes commenced in 1866. Lehigh University has devoted a website that summarizes the upcoming sesquicentennial and its milestone events (http://www1.lehigh.edu/countdown-150#13969). All departments have been encouraged to write their histories for dissemination by the University Archives. In 1941, Professor Robert D. Billinger, with the participation of his other faculty colleagues, produced a ***75 Year History of the Department of Chemistry and Chemical Engineering***. That history has been digitized and is on-line at http://digital.lib.lehigh.edu/eb/supp/3588/index.pdf . Billinger's report entitled ***Seventy -Five Years of Chemistry at Lehigh University*** was also printed in the *Journal of Chemical Education*, Vol. 19, February 1942, pages 82-85.

Now we are in the process of bringing that history up-to-date. A committee of the current and emerita faculty of the Department (Sturm, Zeroka, Kraihanzel, Foster, Merkel, Roberts, Ferguson, and Heindel) has been producing a history organized around the disciplinary divisions (Analytical, Biochemical, Inorganic, Organic and Physical) that covers the history from 1940 to 2015. Over 40 alumni reminiscences have already been received from graduate and undergraduate alumni. Receiving more of these remembrances suitable for inclusion in the document would be most welcomed.

Please e-mail your story to ndh0@lehigh.edu . Please include what years you were on "Ol' South Mountain" and if possible, your supervisor and your field of study. **Tell us about your career path. Do help make your recollections of Lehigh part of our history**.



Jim Roberts (left), current Associate Chair; Bob Flowers (center), former Chair; and David Vicic (right), current Chair.

CHANGE IS IN THE AIR

This year has brought about many personnel changes to the Department. **Suzanne Fernandez** has joined the Department as a Professor of Practice in Organic Chemistry. She will take on many of the teaching duties of **Keith Schray**, who is currently enjoying his terminal semester sabbatical and will officially retire in January 2016. Our former Director of Instrumentation **Norm Zheng** has left Lehigh to pursue an industrial opportunity in Houston, TX. **Bill Anderson** has come out of retirement and is graciously filling in until we find a new Director. Our Academic Coordinator and editor of this newsletter **Jane Derbenwick** has also announced her retirement. Last but not least, **Bob Flowers** stepped down as Chair on July 1 after serving in that role for 11 years. Bob has done a tremendous job in shaping the Department into its current state. More than half of the faculty and staff were hired by

(continued on page 2)

Bob! And those numbers do not reflect the numerous adjuncts and staff members in our Department, as well as all the faculty and staff hired by Bob who have left the Department to pursue other opportunities. If you think about what is involved in those hires, each of them not only involved talent evaluation, but also tons of paperwork. To put all those hirings in historical perspective, William Chandler, one of the first department chairs, served in that position for an incredible 35 years (1871-1906) and only hired four new faculty. Bob has also impacted tremendously the building and research infrastructure – he was in charge of numerous lab remodelings, large HVAC renovations, the move of the undergraduate labs to the Steps Building, outfitting critical instrumentation, and so on. Indeed he is responsible for transforming the Department into the young and vibrant place that it is today. A celebration in gratitude of all of Bob's efforts was held in July. Bob has turned over the chairmanship to **David Vicic** on July 1. David has been at Lehigh since August of 2012, when he arrived from the University of Hawaii. When David became Chair, he tapped into the expertise of **Jim Roberts**, who is serving as the next Associate Chair. A photo of Jim, Bob, and David from the appreciation lunch for Bob is shown on the previous page.

Keith Schray Retirement

Professor Keith Schray (University of Portland BS 1965, Penn State PhD 1970) arrived at Lehigh in 1972 fresh from a two-year postdoctoral experience at the Institute for Cancer Research (Fox Chase, PA). At Lehigh he developed a graduate course in bioorganic mechanisms, briefly taught the gateway course in biochemistry (Chm 371), and supervised the biochemistry teaching laboratory for a decade. Schray had been pointed to the new Lehigh position by Steve Benkovic, his doctoral advisor at Penn State, who had obtained his undergraduate degree in chemistry at Lehigh.

In an interview Schray pointed out that his postdoctoral advisor, Irvin Rose (Fox Chase Cancer Center), introduced him to bio-mechanisms in carbohydrate metabolism with a project on anomeric specificities of pentose isomerases (Schray and Rose, *Biochemistry*, 1971, 10: 1058-1062). Schray went on to note —with a twinkle in his eye—that while Rose subsequently won the Nobel Prize in Chemistry (2004) for his discovery of how living cells recycle and dispose of unwanted molecules, that wasn't for anything he'd been involved in.

At Lehigh, Schray rose rapidly through the ranks by dint of excellent teaching, good government funding, and good research. His research area more specifically was in enzyme mechanisms moving subsequently into analytical biochemistry, primarily enzyme immunoassays. Schray subsequently served the university as Director of the Division of Biochemistry and Biophysics of the Center for Health Sciences and served the Department as Assistant Chair and then Chair, 1996-2001. While he has won numerous teaching awards, he noted that the two he values most personally are the student Stabler Award and the Alumni Award. The Class of 2005 named Schray as its Deming Lewis Award winner this year.

A photo of a young Keith Schray with Natalie Foster.

New Faculty Spotlight

Dr. Suzanne Fernandez joined the Chemistry department in Fall 2015. Suzanne will serve as Professor of Practice and Director of Organic Chemistry. She earned

her doctorate in Chemistry at The University of Utah and received a Bachelor's in Chemistry from The City University of New York, The College of Staten Island. She has presented her work in various venues and has published in *Phytochemistry* and *Biochemistry*. Suzanne dedicated herself to teaching shortly after completing graduate school. She has extensive teaching experience and has taught courses in Organic Chemistry, Biochemistry, General Chemistry and non-majors Chemistry at several different institutions. Before coming to Lehigh, she served as an Assistant Professor of Chemistry at Delaware County Community College.

FACULTY NEWS

Mark Chen presented a talk titled **"**Synthetic control of solid-state order and polymer-packing orientation for enhanced organic electronic device performance" at the 248th American Chemical Society National Meeting that described synthetic strategies for rationally engineering semiconducting polymer thin films. He also co-authored an article titled "Solution-Processed, Molecular Photovoltaics that Exploit Hole Transfer from Non-Fullerene, n-Type Materials" that was published in *Advanced Materials*. Just recently, Mark was awarded a New Investigator Research Grant from the Charles E. Kaufman Foundation for his work in developing new molecular biradicaloids for organic electronic materials.

Greg Ferguson and his group of graduate and undergraduate students are active in the areas of electrochemistry at the surface of gold and synthetic chemistry on silicon/silicon dioxide. Current research in the first area focuses on the chemistry of the thermodynamically unstable oxide(s) of gold, which his group has used in NSF-funded work as a "protecting group" to allow regioselective synthesis on microelectrode arrays. These oxide studies have revealed new insights not only into the materials themselves, but also into the standard methods typically used in their analysis. A paper describing these results has been submitted for publication. Their work on Si/SiO_2 is a collaborative project with Nick Strandwitz, an assistant professor in the Department of Materials Science & Engineering. This project is funded by the Pennsylvania Infrastructure Technology Alliance and explores the chemistry of cyclic azasilanes, as a means of functionalizing the surface of silicon (or its oxide) without by-products. Gelest, Inc. is a corporate partner in this research.

Robert Flowers gave a Keynote Lecture at the IUPAC Conference on Physical Organic Chemistry entitled: **"**Unraveling the Mechanism of Single-Electron Reduction and Oxidation in Synthetic Reactions." He also gave lectures at University of Michigan and Wayne State University in October entitled: "Give or Take and Electron. Mechanistic Studies of Single Electron Transfer in Synthetically Important Reactions." Flowers was also an invited speaker in China this past spring and gave lectures on his research at the Shanghai Institute of Organic Chemistry, Hangzhou University, Beijing University, and Tsinghua University. His group gave four lectures at the National meeting of the American Chemical Society: "Detecting Single Nucleotide Polymorphisms in DNA Duplexes Using Backscattering Interferometry", Gaby Haddad; "On the Mechanism of Silver-Catalyzed Decarboxylative Fluorination:, Niki Patel (PhD 2015); "Elucidating the Role of SmI_2-Water and Glycol in Reductions: Mechanistic Studies of Anthracene Reduction", Tesia Chciuk; "Radical Arylation of Epoxides by Low-Valent Titanocene Complexes: Mechanistic Studies and Methodology Development", Godfred Fianu.

His group published six papers during the past academic year: "Solvent-Dependent Substrate Reduction by $[Sm\{N(SiMe_3)_2\}_2(THF)_2]$. An Alternative Approach for Accelerating the Rate of Substrate Reduction by Sm(II)" in the *J. Org. Chem.*, "Kinetic and Mechanistic Properties of *fac*-$Ir(ppy)_3$-catalyzed Redox Neutral Coupling of Alkyl Halides and Arenes: The Fate of the Photocatalyst" a collaboration with the group of Corey Stephenson at the University of Michigan in *Chem. Sci.*, "Mechanistic Study of the Titanocene(III)-Catalyzed Radical Arylation of Epoxides" a collaboration with the group of Andreas Gansäuer at the University of Bonn in *Chemistry, A European Journal*, "Expedient and Highly Diastereoselective Synthesis of 2 (2-Hydroxyethyl) bicyclo[2.1.1]hexan-1-ols via Allylsamarium Bromide-Mediated Cascade Double-cyclization" a collaboration with the group of Xiaoxia Wang at Zhejiang Normal University in the *J. Org. Chem.*, "Mechanistic Study of the Samarium Diiodide - *N*,*N*-dimethyl-2-aminoethanol Reducing System" in a special issue of *Tetrahedron Letters* in honor of Professor Harry Wasserman, "Titanocenium(III) Complexes for Catalysis in Single Electron Steps" a collaboration with the group of Andreas Gansäuer at the University of Bonn in *Angew. Chem., Int. Ed.,* and "The Mechanism of Silver-Catalyzed Decarboxylative Fluorination" in the *J. Org. Chem*.

Jebrell Glover chaired a session and presented an invited lecture on "Probing the Structure and Topology of Caveolin-1" at the Annual Meeting of the Biophysical Society February 2015. Glover is also serving as a permanent member of a National Institutes of Health study panel. Glover also co-authored "Secondary Structure Analysis of a Functional Construct of Caveolin-1 Reveals a Long C-terminal Helix" in *Biophys. J.*

Ned Heindel presented an invited paper "CounterACT Medicinal Chemistry Progress: New Topical Anti-inflammatory Agents" at the 9th Annual Conference on Counter Terrorism (New York), June, 2015. The conference was held at the site of the former World Trade Center towers. Heindel also authored a chapter, "A One-Man Festival of Chemistry" in *ACS Symposium Vol. #1153: A Festival of Chemistry Entertainments.* The book was edited by Emerita Professor, Natalie Foster. Heindel co-authored "Sulfa drugs inhibit sepiapterin reduction and chemical redox cycling by sepiapterin reductase" in *J. Pharmacol. & Exp. Therapeutics; "*N-ω-nitro-N-ω'-substituted guanidines: A simple class of nitric oxide synthase inhibitors" in *Mod. Res. Inflamm*.; and "Therapeutic potential of a non-steroidal bifunctional anti-inflammatory and anti-cholinergic agent against skin injury induced by sulfur mustard" in *Toxic.& Appl. Pharm*.

Heather Jaeger has had a busy summer presenting her planned work at workshops in the Telluride Science Research Center. She presented "*Ab initio* modeling of hybrid coordination polymers" at the Nanomaterials workshop. She presented, "*Ab initio* adventures of charge dynamics in hybrid coordination polymers" at the workshop on Excited States and, finally "Mixed-Quantum Classical Simulations of Charge Dynamics" at the workshop on Nonequilibrium Dynamics. These presentations follows ideas she laid out at the ACS meeting in Denver, "Electronic Transport in Metal-Organic Hybrid Materials."

(continued on page 4)

FACULTY NEWS (continued)

Heather now has a 20-node Intel computer cluster, which she is using to compute electronic states and *ab initio* molecular dynamics trajectories for molecular clusters and chains comprised of hundreds of atoms. Heather has presented her research on electron and hole dynamics in nanoscale materials to the Materials Science and Physics Department within this past year. Next fall she will discuss her research in nonadiabatic dynamics in Lehigh's Mathematics Department. She has recently published a paper entitled, Photo-Induced Dynamics in Carbon Nanotube Aggregates Steered by Dark Excitons" in the *Journal Physical Chemistry Letters*.

Kai Landskron presented a talk, "Supercapacitive Swing Adsorption of Carbon Dioxide" at a Green Chemistry Conference and he presented a poster on "High-Pressure Chemistry with Mesoporous Boron Nitride" at the North East Corridor Zeolite Association Conference, the COMPRES annual meeting, and the Gordon Conference on Nanoporous Materials. Landskron co-authored **"**Mechanical and hydrothermal stability of mesoporous materials at extreme conditions" and "Synthesis of mesostructued stishovite from FDU-12/carbon composite" in *Microporous & Mesoporous Mats*. Landskron co-authored with Berenika Kokoszka (PhD 2015) and Nina Jarrah (PhD 2015) *et. al.* **"**Supercapacitive Swing Adsorption of Carbon Dioxide" in *Angewandte Chemie, International ed.* Landskron also co-authored **"**Size tunable synthesis of solution processable diamond nanocrystals" in *Chem. Comm*. Landskron spearheaded a new concept to raise money for research from personal donations. Landskron created his model because the current funding mechanisms for research are not sufficient. This new fundraising model was featured in the April 9, 2015 *Lifestyle* section of the *Brown and White* written by Kayla Lash. In addition, it was covered by the *Huffington Post* on April 7, 2015 in an article written by Sam Stein, as well as the *Nature* magazine on June 10, 2015 in an interview conducted by Virginia Gewin. For a minimum of $10, the donor receives a "Dinner-and-a-Movie" discount card worth more than $10. The card is valid for one year and may be used at over 100,000 locations.

David Moore presented a talk at the Gordon ResearchConference on Vibrational Spectroscopy. His group also presented at the 69th International Symposium on Molecular Spectroscopy. He presented seminars at Lehigh for Sigma Xi as well as for the Department of Chemistry. David gave invited talks at 12 universities and one National Lab. David's work was highlighted in the September issue of *International Innovation*. David also contributed commentary for a "round-table" discussion of the future of alternative energy research in that same issue. David co-authored the following papers: "Chemical reactions triggered using electrons photodetached from "clean" distributions of anions deposited in cryogenic matrices via counter-ion co-deposition." in *J. Phys. Chem. Lett*. and "Supercapacitive swing adsorption of carbon dioxide" in *Angew. Chem. Int. Ed*.

Marcos Pires presented an abstract and poster "D-amino acid based modification of bacterial cell surfaces" at the Gordon Research Conference Bioorganic Chemistry (2015) and a poster titled "D-Amino Acid Remodeling of Bacterial Cell Surfaces," at the American Peptide Symposium. In the spring, Pires was also the recipient of the Faculty Research Grant. The research group has published five peer reviewed journal articles so far in 2015 and they have two additional articles out for review. The articles published are:
1. Pidgeon S, Fura J., Leon W., Birabaharan M., Vezenov D., & Pires MM. "Metabolic-Based Profiling Of Bacteria Via Unnatural C-Terminated D-Amino Acids" in *Angewandte Chemie International Edition* (2015) **54**, 6158-6162.
2. Pidgeon S. & Pires MM. "D-Amino Carboxamide-Based Recruitment Of Dinitrophenol Antibodies To Bacterial Surfaces Via Peptidoglycan Remodeling." Chemical Communications (2015) 51, 10330-10333.
3. Fura J. & Pires MM. "D-Amino Carboxamide-Based Recruitment Of Dinitrophenol Antibodies To Bacterial Surfaces Via Peptidoglycan Remodeling" in *Biopolymers* (2015). *In Press*.
4. Sabulski M., Wang Y., & Pires MM. "PAD2 Activity Monitored Via A Fluorescent Substrate Analog" in *Chemical Biology & Drug Design* (2015) *In Press*.
5. Sarkar S. & Pires MM. "D-Amino Acids Do Not Inhibit Biofilm Formation In Staphylococcus Aureus" in Plos ONE (2015) 10, E0117613. (Plos ONE is an online only journal).

Steven Regen presented an invited paper at a Department of Energy workshop and gave a lecture at the U. of Massachusetts. He designed and co-authored seven articles in juried/peer reviewed journals over the course of the academic year. Titles of the articles ranged from "Polyelectrolyte Multilayers on PTMSP as Asymmetric Membranes for Gas Separations," "Push-Pull Mechanism for Lipid Raft Formation" and "Eliminating the Roughness in Cholesterol's β-Face," all in *Langmuir*. He published "The Structural Role of Cholesterol in Cell Membranes" in *Acc. Chem. Res.* and "Splaying Hyperthin Polyelectrolyte Multilayers to Increase Their Gas Permeability" in *Chem. Comm*. In addition Regen co-authored "Molecular Umbrella Conjugate for the Ocular Delivery of siRNA" and "Molecular Umbrella-Amphotericin β Conjugates" both in *Bioconjugate Chemistry*.

Jim Roberts developed the CHM 334/335 year long Advanced Lab sequence for Chemistry majors, and the sequence is finally "stable." He is still developing new experiments to be able to "rotate" experiments from year to year. One experiment was successfully moved from a 20 year old HPLC to a new HPLC-MS with expanded capabilities. He's had a total of three undergraduates helping develop these new experiments. The following are numerous service areas of Roberts. Since 1996 Jim has served as faculty advisor for the Alpha Psi chapter of Alpha Phi Omega, a co-ed national service fraternity. He hosts a "welcome back" dinner each semester to help them get started. He serves as faculty advisor to the fledgling Fitness and Weightlifting club.

(continued on page 5)

FACULTY NEWS (continued)

As University Head Usher since 1997, Jim is responsible for most commencement ushering duties. He also organizes and directs the candidate lineup and processional, as well as running the PhD Hooding Ceremony. Jim has served on the University Laboratory Safety Committee from 1994 to the present. Since Fall of 2007 he has served as chair of the Chemistry Facilities Committee and chair of the Chemistry Department Safety Committee.

Damien Thévenin published a research article in Molecular Pharmaceutics, "Inhibition of cancer cell proliferation and breast tumor targeting of pHLIP-monomethyl auristatin E conjugates" with Kelly Burns *et al.* in *Mol. Pharm.,* 12(4), 1250–8(2015). Thévenin presented at the 2014 FASEB Summer Research Conference (Molecular Biophysics of Cellular Membranes) on the "Homo- and Hetero-dimerization of Receptor Protein-Tyrosine Phosphatases." He also gave a series of talks on the "Specific Targeting and Delivery of Therapeutics to Cancer Cells Based on the Tumor Microenvironment" at the NIH-NIAAA (Rockville, MD), CNRS-IPBS (Toulouse, France) and at Universitat Autónoma de Barcelona (Barcelona, Spain). Thévenin was Session Chair of the University of Delaware Membrane Symposium in May 2014 and May 2015. He was also awarded a Class of 1968 Junior Faculty Fellowship.

Dmitri Vezenov co-authored several journal articles: "In-plane force–extension response of a polymer confined to a surface" *in Eur. Polymer J.,* "Spontaneous stepwise self-assembly of a polyoxometalate–organic hybrid into catalytically active one-dimensional anisotropic structures" in *Chem. Eur. J.*; "Interaction of single-stranded DNA with curved carbon nanotube is much stronger than with flat graphite" in *J. Am. Chem. Soc.*; and "Use of a wiki-based software to manage research group activities" in *Issues in Sci. and Tech. Librarianship*. In the Fall of 2014, the Da Vinci Science Center (Allentown, PA) installed a permanent nanoscience and nanotechnology exhibit "What is nano?" based on the results of his research funded by the NSF grant "Coupling Theory and Experiment to Quantify Biomolecule-Nanomaterial Interactions."

David Vicic has given invited lectures at U. of Oxford, U. of St. Andrews, U. of Edinburgh, Free U. of Berlin, Humboldt U. of Berlin, and the Chinese National Organic Synthesis Conference. An invited talk at UNC Chapel Hill was cancelled, as all flights into Chapel Hill that day were cancelled due to snow! He also presented a patent talk at the 2015 TechConnect World meeting in Washington, DC as a National Innovation Award winner. The Vicic lab published eight papers during the academic year. One of the papers entitled "Stepwise Conversion of a Platinum Dimethyl Complex to a Perfluorometallacyclobutane Derivative" received the cover graphic for *Organometallics*. Another paper co-authored with Yi Yang titled "Manganese-Catalyzed Aerobic Oxytrifluoromethylation of Styrene Derivatives Using CF_3SO_2Na as the Trifluoromethyl Source" made the list for "Most Read" (most downloaded) for the *Journal of Organic Chemistry* during the month of June. One book chapter was also written for *Topics in Organometallic Chemistry* on the subject of "Transition Metal Catalyzed Difluoromethylation, Difluoromethylenation, and Polydifluoromethylenation." In 2015, David was elected as Vice Chair of the ACS Division of Fluorine Chemistry. In 2018, he will assume the role of Chair of the Division. Douglas Solowey, a former undergraduate in the Vicic lab, has begun his graduate studies in chemistry at UPenn.

Xiaoji (George) Xu presented a talk at the International Conference on Scanning Probe Microscopy on Soft and Polymeric Materials. His topic was "Multimodal Mechanical and Infrared Spectroscopic Nanoscopy."He co-authored **"**Phase stabilized homodyne of infrared scattering type scanning near-field optical microscopy" in *Appl. Phys. Lets*. Xu was lead author of two articles at the University of Toronto prior to his coming to Lehigh: "Mid-infrared Polaritonic Coupling between Boron Nitride Nanotubes and Graphene" in *ACS Nano* and "One-dimensional surface phonon polaritons in boron nitride nanotubes" in *Nature Comm*.

Update from Professor Emeritus James (Jim) Sturm

In response to our last department newsletter, Jim Sturm responded to questions asked of a longtime emeritus about his current activities. "Most retired professors miss their years in the department and tend ***not*** to twiddle thumbs—even though the aging process and the absence of continuing practice lead to decline in expertise. So be it." An activity Prof. Sturm is grateful to be involved in is working with Dan Zeroka as part of Ned Heindel's Sesquicentennial Committee. Dan and Jim meet approximately biweekly to collect feedback related to former and present physical chemistry faculty and students. It's exciting to learn of their many accomplishments, but they'd like a larger group of responders.

ALUMNI NEWS—2015

Gerald A. ("Jerry") Miller (PhD 1980) is a software engineer for NetCentric, a division of Vistronix in the greater Baltimore area. Jerry's wife, Fran, passed away in 2013. In addition to his work in the computer industry, Jerry occasionally plays harmonica in local piano bars.

Jeffrey E. LaGrassa (BS 1994), after 17 years at Air Products & Chemicals in Allentown, is now an R&D chemist at BCI Surface Technologies in Reading. He and wife Alicia welcomed their second child Mya back in July of 2013 and joins big brother Marcus (6). Jeff works with Cody R. Hanna (BS 2012) who is a Technical Service Liaison at BCI.

Clark Russell (BS 1967) read with amusement the piece in the Alumni News about Karl Rahenkamp just starting to make use of his chemistry degree 10 years after graduation. Upon graduation he went into the USAF for 20 years, most of the time as a pilot but also an assignment in the Pentagon. This was followed by 21 years in the aerospace manufacturing industry as an engineering program manager. Finally at age 65 he decided to teach science in Mississippi. He got his state certification to teach chemistry, thereby using his 1967 chemistry degree finally in 2010. True to his undergraduate pattern, it took two tries to pass the Praxis certification test. He fondly remembers Drs. Amstutz and Sturm.

Dr. **Brian R. Strohmeier (MS 1980)** has accepted the position of Research Consultant at the U.S. Steel Corporation Research and Technology Center, which is located near Pittsburgh in Munhall, PA. Brian is responsible for new surface analysis methods development in the areas of X-ray photoelectron spectroscopy (XPS), Auger electron spectroscopy (AES), Raman spectroscopy, and glow discharge optical emission spectroscopy (GD-OES). Since 2012, Brian has authored/co-authored 8 publications and 50 presentations (18 invited) involving applications of XPS for materials surface characterization.

John Texter (PhD 1976) was elected a Fellow of the American Chemical Society and inducted into fellowship status at the August 2015 national meeting. John is Distinguished Professor, Polymers and Coatings, Department of Chemistry at Eastern Michigan University, Ypsilanti.

Peter R. Seoane (MS 1982; PhD 1984) left the position of vice president for Research & Development at Eagle Vision Pharmaceuticals for a position as Industrial Liaison Officer, North Carolina A&T State University, Greensboro, NC.

Ken Kellar (PhD 1991) is Senior Formulation Scientist with Novizon Biologicals, Salem, VA. Ken, who had formerly been Program Scientist at Church & Dwight Co (Princeton, NJ), has become a specialist in the incorporation of microbes, enzymes, and metabolites into formulations used in waste water treatment.

Emily Winn-Deen (LU BS 1974; Boston University (PhD 1978) is the President of RxDx Advisors (San Diego, CA). Emily and her colleagues provide consulting services to the diagnostics and pharmaceutical industries. Emily specializes in product development in molecular diagnostics, personalized medicine, and companion diagnostics.

Dr. Mark DeCrosta (BS 1983) has been promoted to Director of Supply Chain Systems and Global IRT at GlaxoSmithKline.

Gabriel C. Kuklis (BS 2000; MS 2005) was granted a new U.S. patent # 8,598,343 as a co-inventor for his employer, Merck Sharp and Dohme Corp. Gabe, who formerly worked as a research chemist at Schering-Plough helped invent a new synthesis of 2-alkynyl substituted 5-aminopyrazolo-[4,3-e]-1,2,4-triazolo[1,5-c]pyrimidine. These are candidate drugs for treating central nervous system disorders, including Parkinson's Disease, Extra-Pyramidal Syndrome, Restless Legs Syndrome, Essential Tremor and Huntington's Disease. They are also candidate drugs for Attention Deficit Hyperactivity Disorder (ADHD), cognitive impairment and the negative symptoms of schizophrenia.

Yadan Tang (PhD 2014) studied chemistry under Israel E. Wachs' supervision and is now an engineer at Cummins Inc. in Indiana. Yadan coauthored "Identification and Regeneration of Molybdenum Oxide Nanostructures on Zeolites for Catalytic Conversion of Natural Gas to Liquids" in *Science, 2015.*

Sean Keller (BS 2013) in pharmaceutical chemistry received our newsletter since he returned home. He just returned from living in the Philippines for a year after accomplishing his first year of medical school at University of the East Ramon Magsaysay Memorial Medical Center. Sean hopes to get in touch with former classmates.

Arthur Waltking (BA 1959) wrote to the newsletter editor mentioning that he was in many of Professor Jim Sturm's PhD levels courses and in a MS research course leading to his BS in Chemistry. Information about Arthur Waltking's current activities can be found on his website <waltkingassociates.com>. In addition to food science, over the last 30 years, Art Waltking has developed a unique expertise in equity analysis by charting stock holdings using the

(continued on page 7)

ALUMNI NEWS—2015 (continued)

classical point and figure charting technique. This technique provides a clearer picture of consolidations, accumulations, channels and breakouts. From the patterns generated, a more probable projection of the future price action becomes evident.

Angela Mendel Hunter (MS 1999), Data Analyst for the American Chemical Society publication *Organic Letters* co-wrote the editorial, "Review of Supporting Information at Organic Letters" with Editor-in-Chief, Amos B. Smith, III. The editorial appeared in the 19 June 2015 issue of the journal. Before joining the editorial staff of *Organic Letters* (Philadelphia), Angie was a research scientist at Astra-Zeneca Pharmaceuticals, Wilmington, DE.

Dennis Todd (PhD 1978) was named CEO of Community Blood Services, Montvale, NJ. After his Lehigh PhD in analytical chemistry, Dennis took a postdoc in clinical chemistry at the Ohio State University College of Medicine and has worked ever since in hospital-based clinical biochemistry or in clinical analysis companies. Community Blood Services provides blood and blood products to 18-plus hospitals and medical centers in northern New Jersey, New York City and southern New York State.

Thomas M. Finetti (BS 2001; MS 2002, both in chemistry at Lehigh) moved from a multi-partner law firm to private practice as a patent attorney with Charney Intellectual Property Law, Basking Ridge, NJ. Tom did his Lehigh MS in organic medicinal chemistry and worked for Merck before taking his JD at Seton Hall School of Law in 2005.

Victor H. Cohn (BS 1952) read with great interest and nostalgia the January 2015 newsletter, especially the piece about Prof. Amstutz and the Althouse Chemical Co. In the summer of 1951 he had the honor of undertaking his senior thesis under Prof. Amstutz's direction. He worked on the synthesis of several halogenated quinoxalones, but even more significant was the bond they formed that continued until his death. He remembers most vividly a visit to Althouse and a demonstration they presented: "A cloth was immersed in a beaker filled with a red liquid, stirred around for a minute or so, and emerged with panels dyed red, yellow, or blue. Years later when I became a new assistant professor of pharmacology at George Washington University Medical Center, I was able to use this demonstration (thanks to Althouse supplying the dyes and multi-fabric cloths) to illustrate the concept of biological receptor specificity". Those six BS 1952 chemistry graduate became close friends and they had the great advantage of having close relations with faculty that numbered little more.

Piercen Oliver (PhD 2011), after completing his post-doctoral studies at University of Wisconsin, Madison last November, has joined NanoTerra, an innovation and product development company in Boston.

Following post-doctoral work at Lehigh, **Michael Barrett** joined Saladax Biomedical, Inc. located in Ben Franklin TechVentures incubator facility in Bethlehem.

Vladi Heredia Wilent (BS1999) is married and living in the Philly suburbs with 2 girls. She has been at the Temple Chemistry department since 2011 teaching her first love—Biochemistry—that both Profs. Alhadeff and Schray first instilled in her! After completing her PhD from U. Penn, she worked in industry for a few years (Pfizer, San Diego) and then decided to switch to academia. Initially she was at Allegheny College, but since her husband's job moved them to Philadelphia, she was able to transition into Temple Chemistry. It is funny because another Lehigh Chemistry alumna **Alison Tweedie** (BS 1999) lives a few blocks over from Vladi--their kids are in kindergarten in the same school. Small world!

ANDREW JOSEPHSON FEATURED IN *EVERYDAY HEROES*

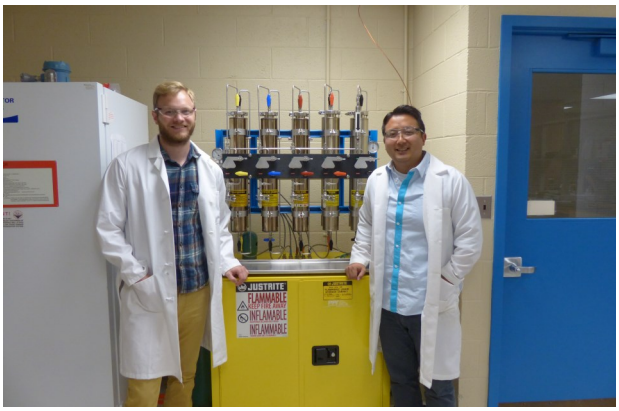
In May 2013 **Andrew Josephson (BS Biochemistry 2013)** accidently found a strange looking old set of CDs. The discs were labeled "Heart Sounds and Murmurs by Daniel Mason, MD" who was Andrew's grandfather. The CDs had a booklet to accompany them which explained that the discs "contained the sounds of 125 different heartbeats, some indicating rare heart conditions." Andrew's grandfather, who passed away at age 92 in 2011, had recorded these heartbeats all throughout his career of 50 years as a noteworthy Philadelphia cardiologist. Andrew realized these sounds should be heard, and spent the summer following his Lehigh graduation teaching himself to write a mobile app of heart sounds for smart phones. His program used an iPhone microphone to record a heartbeat and then match it with Dr. Mason's recordings. When Andrew used the app to test his mother, Tina, her heart sound showed an abnormal outcome, even after several tries. Tina was skeptical but her health began to decline. Following extensive testing, Tina was diagnosed with suffering from a serious disorder which prevents a heart valve from shutting properly. In March 2014 Tina underwent successful open-heart surgery. Tina feels she is very lucky. "My son saved my life."

(excerpted from Everyday Heroes, 09-2014 ed.)

FOCUS ON RESEARCH—MARK CHEN

Mark Chen is developing a new type of solar cell, organic solar cells, that may answer the energy demands of the future. These devices contain organic semiconductors and are the focus of research currently underway in the Chen laboratory.

Chen is an assistant professor of chemistry who studies materials design and is working to develop new polymers and molecules for emerging solar technologies. Organic semiconductors are nonmetallic, carbon-based materials that possess the ability to conduct electrons. Semi-



Grad student Caleb Wehrmann (left) at work with Mark Chen in the Chen lab

conductivity can occur with single molecules and long polymer chains, depending on the structure. Chen and his colleagues are designing new compounds with semiconducting properties in the laboratory; the work has yielded promising results in an effort to achieve power-conversion efficiencies above eight percent. "In the laboratory, we're aiming for 10 percent," says Chen. We currently get six or seven, but about four years ago, the best we were getting was five. It's not efficient. However, these devices are much thinner and they could be complementary to commercially available silicon-based solar cells." Organic photovoltaics (OPVs) continue to attract research attention for their potential to be flexible, lightweight and efficient devices for power generation. A typical OPV device consists of one or several photoactive materials sandwiched between two electrodes. Organic photovoltaic cells use organic polymers and small molecules as the active layer for light absorption and charge transport. Organic semiconductors are currently employed in technologies such as flat-screen televisions. These substances could help make solar technologies less costly. One advantage of OPV technology is that manufacturing costs can be reduced for organic solar cells compared to silicon-based materials. "If we can use organics, sometimes they can be thinner silicon-based materials." Our research begins in the actual chemical synthesis, which will be followed by taking these compounds and making electronic devices with them."

The Department's Newest Faculty Member is Lehigh's 14th President

On July 1, 2015, John Simon assumed the role of president of Lehigh University. John's administrative leadership accomplishments are second to none and have been well advertised. John is also a chemist by trade and has proven himself to be a leader in the chemical community. John has published more than 250 papers and four books. For his research efforts, he has received many prestigious awards (such as the Photon Award of the American Society for Photobiology) and has served on the Advisory Board of important journals of the field. John has been continually funded during the course of his scientific career and has also been invited as a speaker to many Universities and many important conferences in the field. We are excited to have John here at Lehigh!

Fund a New Project!

Donations represent an important part of our continuing efforts to create a state-of-the-art environment for teaching and research at Lehigh. The Chemistry Department has created an internet link so that monetary donations can be made hassle-free online at: http://mylehigh.lehigh.edu/ChemistryGifts Donations to the Department through traditional pathways can still be made through Lehigh's Advancement Office. Please contact the Department Chair if you are interested in funding specific projects.

NEW ALUMNI —CLASS OF 2014-15

PhD Chemistry: Nina K. Jarrah, Berenika A. Kokoszka, Ryan M. Ludwig, Niki R. Patel, Angela N. Smith, and Yadan Tang.

MS Chemistry: Tesia V. Chciuk, Lindsay L. Consdorf, Katherine Davis, Jonathan D. DeCenzi, Kuldeep S. Dhillon, Theodore J. Dickamore, Mary E. Engel, Godfred K. D. Fianu, Patricia A. Force, Pavel Golding, Paula Hawrysz, Oksana Leidy, Giang H. Lu, Brian W. O'Mara, Chad S. Pehrson, Brian M. Peklansky, Christopher Roselle, Joshua B. Ryan and Daniel L. Shollenberger.

BS Chemistry: Anastasia M. Barros, Brian P. Boland, Caroline E. Heitmiller, Kane M. Kuharik, Crystal Lee, Michelle K. Leon, Jeremy W. Lin, Zachary J. McCullough, Zachary H. Mosher, Katrina M. Schwab, Douglas P. Solowey and Alison J. Yirinec.

BS Pharmaceutical Chemistry: Morgan Birabaharan, Brianna Chamuris, Lydia M. Hunt, Michael J. Kerner and Nicole E. Page.

BS Biochemistry: Erika L. Bettermann, George W. Cauley IV, Tanner P. McCleerey, Daniel Paez, Jennifer B. Shah, Carolyn S. Sivco, Samantha R. Sokoloff, Busra Turkyolu, Yu Wang, Maxwell Watkins and Mengzhao (Lucy) Xue.

STUDENT AWARDS—2015

Morgan Birabaharan—American Chemical Society Award presented to the outstanding senior major in chemistry.

Carolyn S. Sivco—American Institute of Chemists Award to an outstanding senior majoring in chemistry or biochemistry.

Yu Wang—ACS Inorganic Chemistry Award for the outstanding senior in inorganic chemistry.

Lydia M. Hunt—ACS Organic Chemistry Award for the outstanding seniors in organic chemistry.

Jin Nam Ahn— Alpha A. Diefenderfer Analytical Award presented to the highest ranking junior in analytical chemistry, sponsored by the ACS Division of Analytical Chemistry.

Tanner P. McCleerey—Merck Index Award presented to an outstanding senior in Chemistry who has been active in student society affairs, and who, in the judgment of the faculty of the chemistry department, has promise of a successful career in chemistry.

Anastasia M. Barros—Harry M. Ullmann Chemistry Prize which is awarded to the highest-ranking senior in chemistry.

Mengzhao (Lucy) Xue—William H. Chandler Senior Prize, established in 1920 by Mrs. Chandler, presented to the highest-ranking senior in the chemistry department.

Jasmine K. Singh—William H. Chandler Junior Prize presented to the highest-ranking junior in the chemistry department.

Alexander S. Kaplitz—William H. Chandler Sophomore Prize presented to the highest-ranking sophomore in the chemistry department.

Douglas Solowey was awarded a prestigious American Chemical Society Moissan Summer Research Fellowship last summer. The fellowship, which paid $5,000 for 10 weeks of research, included salary and supplies. Only two students throughout North America received the fellowship last year. Solowey earned an extra two weeks of research through a College of Arts and Sciences Research Grant. David Vicic, professor of chemistry, was Solowey's research mentor. Their research focuses on developing novel ways to incorporate fluorine into organic molecules. The complete article about Douglas Solowey performing undergraduate research in the Chemistry Department appeared in the Fall 2014 issue of Acumen: https://vicic.cas2.lehigh.edu/sites/vicic.cas2.lehigh.edu/files/solowey%20article.pdf.

GRADUATE STUDENT AWARDS—2015

Peter Kaplan, a graduate student in the Vicic Lab, was a co-winner of the best poster award at the 22nd Winter Fluorine Conference at St. Pete Beach, FL for his poster entitled "New Reagents for $(CF_2)_n$ Transfer and the Construction of Fluoroalkyl-Containing Rings." Winners were selected by referees from industry and academia and received $250.

Congratulations to **Kim Choquette**, (PhD 2013) who received an NIH Fellowship for her postdoctoral work at Princeton. Please read more here: http://www1.lehigh.edu/news/strategy-making-more-potent-drugs.

Congratulations to the following chemistry graduate students awarded the following fellowships for 2015-2016: **Kelly Burns** (Thévenin Group) *Student Chemistry Foundation Fellowship*, **Peter Kaplan** (Vicic Group) *Newton W. & Constance B. Buch Fellowship,* and **Godfred Fianu** (Flowers Group) *C. Scott Althouse Memorial Fellowship*. **Gabrielle Haddad-Weiser** was the winner of the CAS Summer Research Fellowship.

OBITUARIES

WILLIAM C. WALKER

William Comstock Walker (PhD 1946) died at his retirement home in Stone Mountain, GA in October 2014 at the age of 93. William was a member of the Lehigh Chemistry faculty (Research Assistant Professor) from 1948 to 1955. He also served as Associate Director of the National Printing Ink Research Institute and received Lehigh's Alfred Noble Robinson Award for outstanding promise and potential among young faculty. When William was a student, our department was the Department of Chemistry and Chemical Engineering; many students took courses—and even degrees—from both academic units. William's BS (1943) was in Chemical Engineering. His graduate work in physical chemistry/ colloids was applied towards an MS in Chemical Engineering (1944), and his doctorate on the absorption of gases on activated magnesia was in chemistry (1946). He taught courses in physical chemistry and chemical engineering. After nine years in Lehigh's National Printing Ink Research Institute, created by Prof. Albert C. Zettlemoyer, Walker left for a long and productive career in the paper and ink industry at West Virginia Pulp and Paper Co. in Williamsburg, PA. He served the company in many positions including as Director of Research and as Special Assistant to the VP-Research before retiring to Georgia.

JOSEPH S. "JOE" NUNZIO

Everyone who taught or majored in chemistry at Lehigh in the 37 years (1953-1991) that **Joseph S. "Joe" Nunzio** staffed the stockroom will always remember the gregarious, helpful, knowledgeable, Lehigh staffer....the "go-to" guy for any chemicals or disposables one needed in the lab. Joe helped stage department parties, took part in faculty and student weddings, went fishing and hunting, and would pull-all-stops to move that rush order some researcher was waiting for. Many alumni recount the story of how Joe rid the Chandler Lab eves of hundreds of nesting pigeons with his marksmanship with a B-B gun. Joe, age 83, passed away in Emmaus in March 2015.

Joe Nunzio (left) chats with Keith Schray at a departmental party, 1991.

CHARLES S. "CHUCK" KRAIHANZEL

Retired Professor **Charles S. "Chuck" Kraihanzel** died in March 2015 in Bethlehem. Chuck, known to students, faculty and friends as "coach" for his avocational interests in basketball and baseball, was one of the best and much beloved chemistry teachers Lehigh has ever employed. He arrived at Lehigh in 1962 as an Assistant Professor fresh from a postdoctoral experience at MIT and a PhD in Inorganic Chemistry from the University of Wisconsin. His MS (organic chemistry, 1959) was also from Wisconsin. Chuck was born September 6, 1935 in New Bedford, MA and began his collegiate studies at nearby Brown University (BS 1957).

When at the 1993 faculty/staff dinner Chuck was awarded Lehigh's highest teaching honor, the citation for the Lindback Award recounted Chuck's many achievements. He was cited "not only for personal excellence in communicating chemistry in the classroom but also for academic leadership." The award went on to note that Chuck had created a new Freshman course designed to

(continued on page 11)

OBITUARIES (continued)

cater to a broad audience, established an undergraduate computer laboratory, and introduced molecular modeling and computational dynamics into the curriculum. Although he retired in 2001 as Professor of Chemistry, Chuck was as active in his church and community as he was at Lehigh.

Chuck coached Little League baseball, worked as Summer Camp Director at Camp Ichthus, sang in the choir, and taught Sunday School at First Baptist Church. He was also a Church Moderator and a Deacon. Chuck was survived by his wife of 57 years, a daughter, three sons, 12 grandchildren, and several great-grandchildren as well as the warm memories of hundreds of Lehigh chemistry alumni.

GEORGE SOLOMON HARTMAN

The Department and the University lost a loyal alumnus of long standing with the passing of **George Solomon Hartman** (BS Chem Eng 1943; MS Chem 1948) at the age of 93 in Bridgewater, VA in January 2015. George was a native of Bethlehem, graduated from Liberty High School, and enrolled at Lehigh in the then combined departments of Chemistry and Chemical Engineering. Because of WWII, George finished his BS just in time to be inducted into the U. S. Navy and to serve two years in the Pacific Theater of war. He received certification as a Professional Chemical Engineer.

George returned tofor Lehigh administrators and other academic departments in Lehigh after the war as a graduate student and completed his MS in physical chemistry. He spent his career as an electrochemist for the Electric Storage Battery Co and its successor, EXIDE, where he worked in battery development from the standard lead-acid battery to those involving silver, zinc, lithium, magnesium and silver chloride. Several of his battery types were used in the Space Program. He retired in 1987 but remained active as a consultant. George frequently revisited his hometown, Bethlehem, and stopped by the department to reminisce about the faculty who taught him in his student years: Amstutz, Billinger, Serfass, and Smull.

STAFF RETIREMENT

Jane Derbenwick has announced her retirement this fall after 25 years as an Academic Coordinator at Lehigh. Her first six years were spent in the Biology Department (now the Biological Sciences Department), including the time when that department relocated from Williams Hall to the Mountaintop Campus. Since 1996 Jane has been the first person you encounter when you call the Chemistry Department or enter the Chemistry Department Office in Seeley Mudd.

During her time at Lehigh she has worked closely with a total of nine department chairmen. In Chemistry Jane has worked with the department faculty and staff on a wide variety of activities and projects. She also has been a main contact person

JANE DERBENWICK

for Lehigh administrators and other academic departments in their interactions with the department. As a person who loves meeting and helping people, Jane particularly enjoyed her role in scheduling and coordinating the activities of Lehigh visitors who presented department seminars or interviewed for faculty and staff positions in the department. She cherishes relationships she's developed with so many people, especially those from different cultures. Several years ago Jane became editor of the department newsletter, *Mudd in Your Eye*.

Taking advantage of the educational opportunities available to Lehigh staff, Jane obtained an M.Ed. degree in Community Counseling in the College of Education during her time on the Mountaintop campus. Although she decided to not make counseling a fulltime career, Jane says that many of the things she learned during these studies have been useful in her job as Academic Coordinator. Some of her other activities at Lehigh included being a volunteer usher at Zoellner Arts Center for the last 16 years and a member of ERAC (Employee Relations Advisory Committee) for three years.

Although she will miss the excitement and challenges of working in the Chemistry department, Jane is looking forward to the flexibility that comes with retirement. She plans to keep busy with several community projects and church activities, do lots more reading, and plans to continue ushering at Zoellner. Now she also hopes to be able to spend more time with her three children and two grandsons.

Department of Chemistry
Lehigh University
6 East Packer Avenue
Bethlehem, PA 18015-3102

http://www.lehigh.edu/~inche

Department Chair
David A. Vicic
610-758-3466
dav512@lehigh.edu

Undergraduate and Graduate Coordinator
JoAnn DeSalvatore
610-758-3471
jmd207@lehigh.edu

Faculty & Academic Coordinator
Newsletter Editor (retiring August 2015)
Jane Derbenwick
610-758-3470
rd0b@lehigh.edu

WE WANT TO HEAR FROM YOU

Please let us know the new developments in your professional or personal life.

You can email the newsletter editor at rd0b@lehigh.edu. Contact information for the faculty is on the department web site: http://www.lehigh.edu/~inche

We'd like to have your contact information, especially your email address. If you would prefer to receive the electronic version of this newsletter, please let us know.

Previous newsletters can be viewed in color on the department web site at: http://www.lehigh.edu/~inche/.

Does anyone recognize the professor in the photo at the right? Email Ned Heindel at <ndh0@lehigh.edu> if you recognize him.