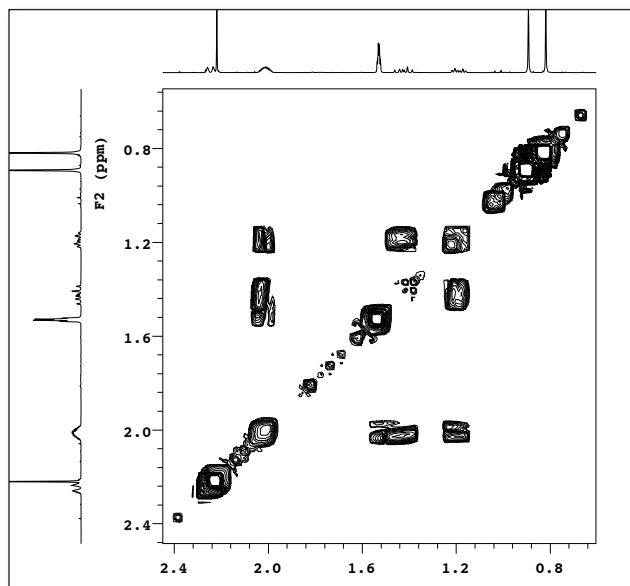




Periodical

Canisius Chemistry and Biochemistry Newsletter • Fall 2014



NSF Grant Funds New NMR

In the summer of 2012 the Major Research Instrumentation program of the National Science Foundation (NSF) awarded the Department a \$285,000 grant to purchase a new 400 MHz NMR spectrometer (pictured above) to support research projects and student training in response to a proposal submitted by Mary O'Sullivan (PI), Tim Gregg, Jeremy Steinbacher, Sarah Evans and Mariusz Kozik (co-PIs). This instrument replaces our 250 MHz NMR, which was purchased 20 years ago with funds from an NSF award to Mariusz and Frank Dinan. The new Agilent 400 MHz DD2 spectrometer became operational in the summer of 2013. A major feature is a gradient amplifier that can generate pulsed field gradients and perform selective excitation using shaped gradients. These capabilities are needed for a range of experiments including ones that involve diffusion processes. For example, Mariusz and his students have conducted diffusion ordered spectroscopy (DOSY) studies to determine if heteropolytungstates exist as dimers in solution. Also, the faculty and students can now routinely perform a slew of 2-D experiments (including COSY, HSQC, NOESY, HMBC) that were previously either extremely difficult or impossible to conduct.

To date, 16 students have used the new 400 MHz NMR in their research projects and nearly 40 students have been trained to acquire both 1- and 2-D spectra in the CHM334 Spectrometric Analysis and CHM401 Modern Synthetic Methods courses. We are excited by the new possibilities and applications for the 400 MHz spectrometer, from introducing new NMR experiments in lab courses to exploring new directions in our research projects. We are especially pleased that we can continue to provide all of our chemistry and biochemistry majors hands-on experience with modern examples of the main categories of instrumentation that they are likely to encounter at graduate school and in chemical and biochemical industries. Photos, descriptions and a video of our instrumentation can be viewed on our website <http://www.canisius.edu/chemistry/>, or see it in person the next time you are in the area.



A Message from the Chair



Greetings to All Griffin Chemists and Biochemists!

During the two years since our last newsletter, challenging times have continued for Western New York, Buffalo, and Canisius. As the demographics of WNY change and the number of high school graduates in WNY continues to decrease, this has impacted the number of incoming freshmen to Canisius and other private colleges in the area. Fortunately, the Department's increased recruiting efforts have been effective, and we have been able to maintain the number of chemistry and biochemistry majors at Canisius. The Department continues to graduate about 20 chemistry and biochemistry majors per year: 17 in 2012, 21 in 2013 and 21 in 2014. We expect to graduate 20 new chemistry and biochemistry Griffins in 2015!

Departmental faculty continued to develop new courses and secure grants from prestigious funding organizations for new instrumentation and research activities. Sarah Evans, Phil Sheridan, and Jeremy Steinbacher have created three new advanced courses to add new dimensions to our Chemistry and Biochemistry curricula: Molecular Biology, Advanced Physical Chemistry, and Materials Chemistry, respectively. A group of several faculty, under the leadership of Mary O'Sullivan, was awarded \$285,000 from the Major Research Instrumentation division of the National Science Foundation to purchase a 400 MHz NMR spectrometer. This new instrument has replaced the old 250 MHz NMR and has enabled numerous additional capabilities for both our students doing research and those in CHM334 Spectrometric Methods and other courses. Also, most recently the National Science Foundation awarded Jeremy Steinbacher a three-year grant of \$135,000 for his research group's work in bio-nano-technology. More on these and other departmental accomplishments are detailed within the Newsletter.

At this time, as always, I am reminding all readers that the Department would not exist as a community without the wonderful interactions we have with our alumni. I encourage you to continue to keep us up to date with events in your lives; we so much enjoy hearing about your new family members, your new careers and jobs and your adventures. Also, don't be shy, please consider sharing with our Griffin Chemists and Biochemists community and submit information for future Newsletters and for our new alumni profile webpage at <http://www.canisius.edu/chemistry/alumni/alumni-contact-us/>.

We often think of our alumni and we are proud of your accomplishments.
Keep in touch!



This issue of Periodical, the Canisius Chemistry and Biochemistry Newsletter, was prepared under the guidance of our new editors, Phil Sheridan and Jeremy Steinbacher. Many thanks go to Rebecca Francisco for layout assistance and to Pete Schaber for his work as the previous editor of this newsletter.

Faculty & Staff

Mariusz Kozik, Ph.D.
Chair, Inorganic Chemistry

Mary O'Sullivan, Ph.D.
Organic Chemistry

Peter Schaber, Ph.D.
Analytical Chemistry

Timothy Gregg, Ph.D.
Organic Chemistry

Roberto Gregorius, Ph.D.
Chemical Education

Phillip Sheridan, Ph.D.
Physical Chemistry

Steven Szczepankiewicz, Ph.D.
Analytical Chemistry

Sarah Evans, Ph.D.
Biochemistry

Jeremy Steinbacher, Ph.D.
Materials Chemistry

Allyson Backstrom, Ph.D.
Organic Chemistry

Kristina Marohn, M.S.
General Chemistry Laboratory

James Maul, Ph.D.
Organic Chemistry Laboratory

Frank Dinan, Ph.D.
Professor Emeritus

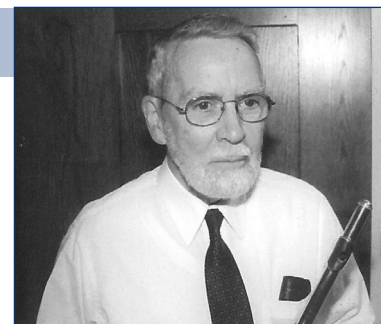
Joseph Bieron, Ph.D.
Professor Emeritus

Thomas Stabler, M.S.
Director of Chemistry Laboratories

Alice Steltermann
Administrative Associate

Contact the department office at:
stelter@canisius.edu
or call us at 716-888-2340

In Memoriam: Professor James E. Van Verth



The Department is saddened to share with you a recent loss. James E. Van Verth, longtime faculty member of the Chemistry & Biochemistry Department, passed away after a long illness on August 19, 2014. Affectionately known as Jim by faculty colleagues, alumni and friends, he joined the Chemistry Department in September 1963.

Jim obtained his undergraduate degree from Xavier University in Cincinnati in 1950, his Master's degree from the University of Detroit in 1952 and a Ph.D. degree in Chemistry from Indiana University in 1957. Before coming to Canisius, he worked in industry at Monsanto Chemical Co. in West Virginia and completed a post-doctoral research appointment at Yale University from 1961-1963.

Jim regularly taught Organic Chemistry and General Chemistry courses as well as an area studies course for non-science majors, Chemistry and Ideas. He was an innovator in using computers for teaching chemistry and coordinated development of the Macintosh Computer Lab for use in the sciences. His integration of computers into courses began in 1978 and continued into the 1990s.

Jim spent his sabbatical years working with prominent chemists at other universities: Calvin Ritchie and Peter Lansbury at University at Buffalo and Williams Saunders Jr. at the University of Rochester. Jim also maintained a research program at Canisius that engaged a number of undergraduates over the years. At times, his work was supported by grants from the Petroleum Research Fund (PRF) and the Advanced Institutional Development Program (AIDP).

Jim frequently collaborated with faculty colleagues. He was an active contributor in developing a self-paced course in Organic Chemistry with Frank Dinan. He also participated in musical presentations (flute/piano) with Fr. Paul McCarthy. Jim retired from full-time teaching and entered the Faculty Resource Program (FRP) in 1996. This part-time service allows faculty to teach one semester per year for five years. Jim retired from the faculty in 2001, but continued to give service to the department as Professor Emeritus by maintaining a roster of Chemistry & Biochemistry alumni and serving as editor of this newsletter.

Jim is survived by his spouse Patricia Van Verth, a long-serving faculty member in the Department of Computer Science, and two adult children, James and Elizabeth. Please remember Jim and his family in your prayers.

Crowdle Award Nominations

We are currently soliciting self-nominations for the Professor James H. Crowdle Award for Distinction in Chemistry. This award is the highest honor that the Department bestows on a member of its alumni; it recognizes significant achievements in chemistry or biochemistry made by a graduate of this department.

Previous Crowdle Award recipients can be found at <http://www.canisius.edu/chemistry/alumni/crowdle-award/>

Self-nominations should include a cover letter describing your significant achievements in chemistry or biochemistry, a resume or CV, and the names and contact information for two references familiar with your accomplishments. Please send this information to Phil Sheridan at sheridap@canisius.edu. We anticipate the next Crowdle Award being presented in the Spring of 2016.

Thank You!

We would like to express our sincere gratitude to all those listed below who have made a recent generous financial contribution to the Department of Chemistry and Biochemistry:

Andrew Minkel ('08), Kathleen M. Coughlin, Ph.D. ('06), Kathryn E. Leach ('03), Richard M. Morlok ('96), Kristin M. Fries, Ph.D. ('87), Diane P. Baisch ('83), Diane M. Ray ('78), Peter M. Schaber, Ph.D. ('75), David P. Nalewajek, Ph.D. ('74), Daniel E. Rega ('74), Pauline M. Ziatts ('74), Timothy G. Burdo ('72), Michael V. Darby, Ph.D. ('72), Michael R. Krajewski ('72), Paul L. Piciulo, Ph.D. ('72), Gerald Zon, Ph.D., FRSC ('67), Dennis J. Linda ('66), Dennis P. Bakalik, Ph.D. ('65), Joseph P. Lafornera, Ph.D. ('64), Kenneth F. Pompei, Ph.D. ('63), Raymond J. Lange, Ph.D. ('61), Harold J. Brand ('60), James J. Maul, Ph.D. ('60), David W. Skelly, Ph.D. ('60), Robert F. Czaja, Ph.D. ('58), Thomas J. Dougherty, Ph.D. ('55), and Henry Heubusch ('45)

We would also like to thank the following individuals for the establishment of the Class of 1960 fund. Their combined contribution of over \$10,000 has enabled the department to fund student travel expenses for the 2013 and 2014 ACS national meetings:

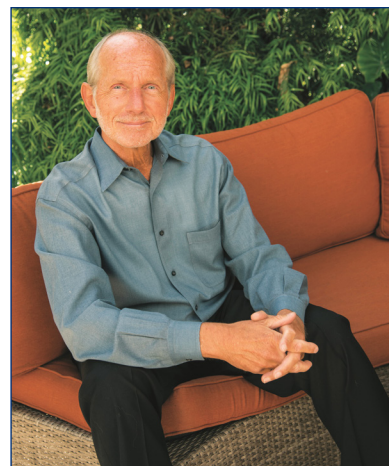
David R. Brackenridge, Ph.D., Harold J. Brand, Fred M. Karkowski, Ph.D., Leonard A. Krantz, Jr., Robert L. Kuczkowski, Ph.D., James J. Maul, Ph.D., and David W. Skelly, Ph.D.

Our gratitude is further extended to Gerald Zon, Ph.D., FRSC ('67) for his generous establishment of an endowed fund to permanently support undergraduate research in the Department of Chemistry and Biochemistry. In honor of his gift, the department award given to senior chemistry and biochemistry majors who have completed significant research accomplishments has been renamed the Gerald Zon Undergraduate Research Award.

Your Contributions Making a Difference

Our research programs continue to thrive with around 15 Canisius students annually involved in various projects, leading to reports by students at national meetings and peer-reviewed publications. However, funding for students to conduct research during summers and to travel to meetings to present their research results is becoming increasingly difficult to find.

The opportunity for so many students to be involved in research has been made possible with generous financial support from numerous alumni. We thank all of our alumni for their support! We would like to offer our special thanks to Jerry Zon ('67) who has donated significant funds for research students' stipends and cryogenes for the new NMR. Also, the Class of 1960 Fund (established by Dr. James Maul) has supported student travel to national meetings. *We ask that you please continue to keep our students and our research programs in mind when you make donations to Canisius.* Be assured that when you earmark your donations for the Chemistry and Biochemistry Department, all of these funds are used to directly support our students in helping to maintain our vibrant, student-centered research activities. Please see **page 5** for a list of student researchers the department has recently funded and **pages 12-14** for presentations and publications resulting from this work.



Jerry Zon ('67)



Student ACS Chapter Meeting, 1959

Student Researchers

Sarah Evans:

Corey Damon (BCH ACS '12), Elisabeth Geyer (BCH '13), Kristin Hill (BCH ACS '14), Reena Patel (BCH, CHM HT '14), Amanda Fleck (CHM HT '14), Carly Andriaccio (BCH '15), Andrew Cherny (BCH ACS '15), Dustin Radka (BCH '15), Lauren Evans (BCH ACS '16), Gabrielle Budziszewski (BCH '16), Christian Binns (BCH ACS '17)

Tim Gregg:

Russell Algera (CHM ACS '12), David Fortman (CHM ACS '13), Caleb Kitcho (BCH '15), Michael Rodman (CHM HT '15), Brianna Gibney (Med Lab '17)

Mariusz Kozik:

Nicholas Pantano (BCH ACS '14), Skyler Sweeney (CHM HT '15), Nicole Fusco (CHM ACS '16), William Swanson (CHM '17), John Grasso (HS), Kristina Kasprzycki (HS), Jessica Marshall (HS), Benjamin Russ (HS),

Mary O'Sullivan:

Andrew Forrestel (CHM HT '12), Jessica Stachowski (CHM ACS '12), Jesse Fodero (BCH '13)

Peter Schaber:

Caressa Trueman (CHM HT '15), Geoffrey Hobika (CHM HT '17)

Phil Sheridan:

Justin Young (CHM ACS '13), Marshall Binns (CHM '14), Joseph Lesh (BCH ACS '17), Connor Tumiel (BCH ACS '17)

Jeremy Steinbacher:

Zackary Falls (CHM ACS '12), Jamie Hitro (CHM HT '13), John Heck (CHM ACS '14), Jonathan Binns (CHM ACS '15), Joseph Schnitter (HIST '15), Sabrina Fitzgerald (BCH '17), James Rutowski (CHM '17)

Steve Szczepankiewicz:

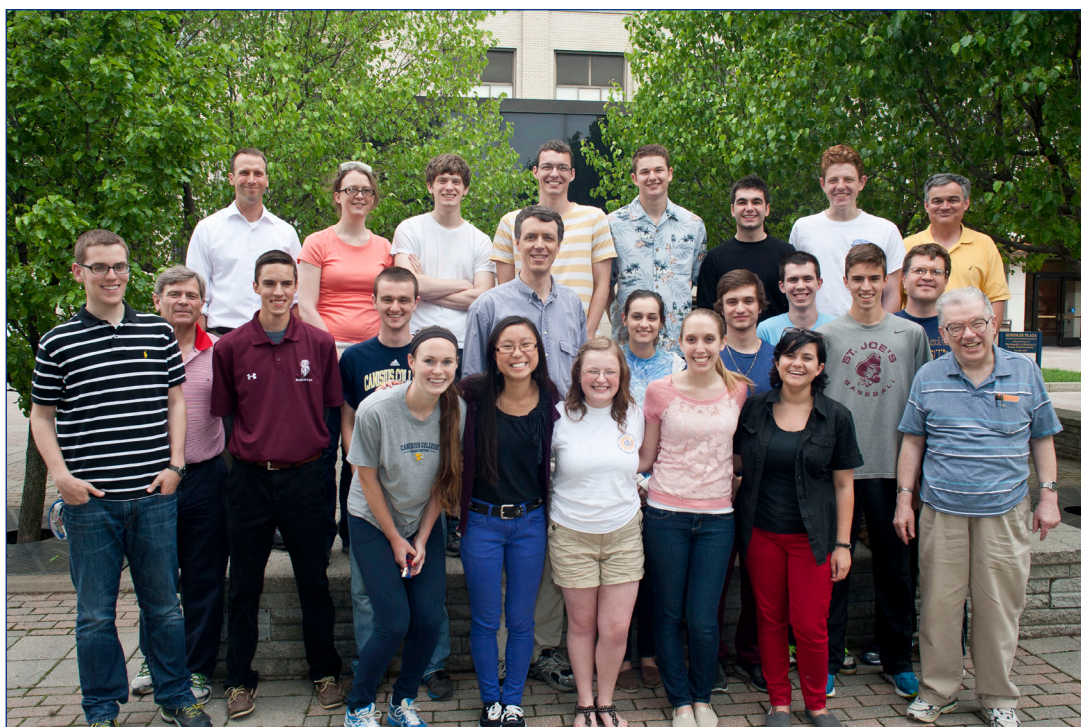
Adam Dannenhoffer (CHM ACS '14), Nicole Fusco (CHM ACS '16), Trevor Tumiel (CHM ACS '17), Patrick Forrestel (HS)

CHM/BCH: Chemistry/Biochemistry Major

ACS: Degree Certified by the American Chemical Society

CHM HT: Chemistry, Health Professions Major

HS: High School



2014 Summer Student/Faculty Researchers

2012 Gassman Seminar

Melanie Sanford, the Arthur F. Thurnau Professor of Chemistry at the University of Michigan, Ann Arbor, presented the 2012 Paul G. Gassman Memorial Seminar on Thursday, March 1, in the Montante Cultural Center. Her seminar was entitled “Tackling Global Challenges In Sustainable Chemistry Using Transition Metal Catalysis.”

Sanford is a leading researcher in the design of new synthetic strategies for transforming unreactive carbon-hydrogen bonds into moieties that are readily amenable to chemical modification. This work has profound implications for enabling a more efficient and environmentally friendly synthesis of chemicals including pharmaceuticals, agrochemicals and plastics.



Prof. Melanie Sanford

Sanford has received numerous prestigious awards presented by both US and international chemistry professional societies (the American Chemical Society and the Royal Society of Chemistry), from major foundations (including the MacArthur and Beckman foundations), and from several pharmaceutical and chemical companies. Additionally, Sanford has received awards in recognition of her teaching. She is a MacArthur Fellow (2011), a Fellow of the American



Prof. Sanford at Canisius

Association for the Advancement of Science (2011), and an Alfred P. Sloan Foundation Research Fellow (2006). During the past few years, she has been presented the ACS Award in Pure Chemistry (2011), the ACS Arthur C. Cope Scholar Award (2008), the Royal Society of Chemistry Fluorine Prize (2011), a Presidential Early Career Award for Scientists and Engineers (2006), the BASF Catalysis Award (2009), the Roche Excellence in Chemistry Award (2007), the DuPont Young Investigator Award (2007), the AstraZeneca Excellence in Chemistry Award (2006), the GlaxoSmithKline Chemistry Scholars Award (2006) and the Abbott Young Investigator Award (2006), among others.

Paul Gassman, Ph.D., was a distinguished alumnus of Canisius College and a major benefactor who established an endowment for a lecture series. He died suddenly in 1993 and this seminar series was established in his honor. The Gassman Memorial Seminar series provides opportunities for science majors in the beginning of their college studies to meet with and hear a renowned chemist discuss their research and the impact of their work on our environment and society. Previous speakers have included Jerrold Meinwald (Cornell University), Harry Gray (California Institute of Technology), Carolyn Bertozzi (University of California, Berkeley), and Geoffrey Coates (Cornell University).

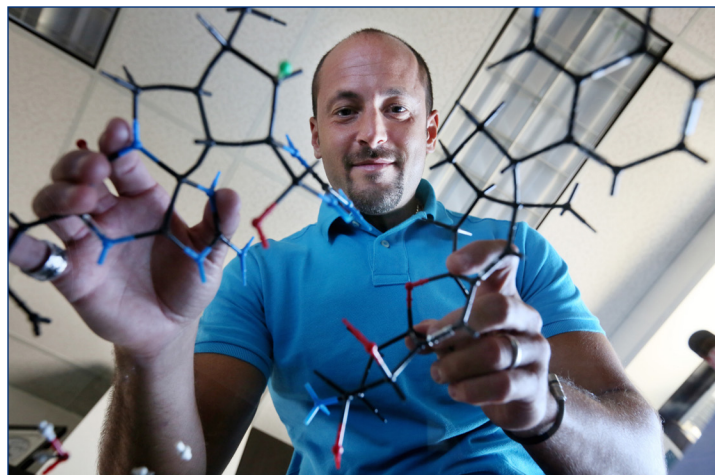


Students meet with Prof. Sanford

Looking forward to Gassman 2015

The Department is excited to announce that Phil S. Baran, the Darlene Shiley Chair in Chemistry at the Scripps Research Institute in La Jolla, CA is the 2015 Gassman Memorial Seminar speaker. The presentation will take place on Friday, March 13, 2015, at 2 p.m. in the Montante Cultural Center. The seminar is free and open to the public; all alumni are invited to attend.

Baran is a superstar in the field of organic total synthesis, specializing in complex molecules derived from natural sources. No less than the legendary organic chemist E.J. Corey, with whom Baran conducted his post-doctoral studies, has

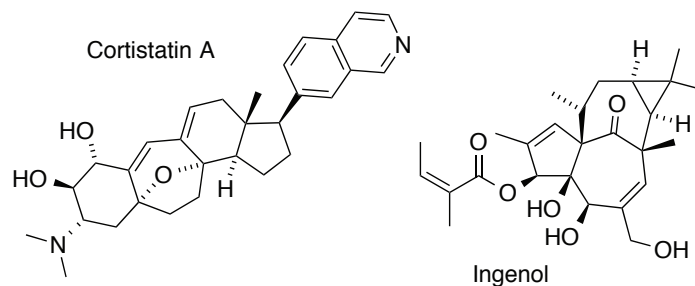


Prof. Phil Baran

called Baran “one of the most brilliant young organic chemists that I have ever worked with or known.” Indeed, Baran’s career has followed a meteoric trajectory – after graduating from New York University with a bachelor’s degree in chemistry in two years, he joined K.C. Nicolaou’s lab at The Scripps Research Institute, earning his Ph.D. in less than four years. From there, Baran joined Corey’s lab at Harvard University as a National Institutes of Health Post-Doctoral Fellow before landing his independent position as an Assistant Professor back at Scripps at the astounding age of 26 (in 2003). He rapidly rose through the academic ranks, attaining the position of full professor only five years later in 2008. In 2009, Baran received a dual appointment in the Skaggs Institute for Chemical Biology, also at Scripps.

Baran’s research has focused on the total synthesis of many complex natural products. His list of completed syntheses is long and inspiring, but notable standouts include the CP-molecules with Nicolaou, austamide and related molecules with Corey, and ingenol, cortistatin A, and palau’amine in his own laboratory. Baran has made further contributions by developing new organic methodologies in the course of his syntheses, including advances in ring-closing reactions, site-controlled oxidations, and fluoroalkylations.

This remarkable output has resulted in nearly 150 peer-reviewed journal articles, four patents, and a book. He has been a named or a plenary speaker on more than 100 occasions, and frequently consults with or sits on the scientific advisory boards of many pharmaceutical companies, including Bristol-Myers Squibb, TetraPhase, TEVA, Eisai, and DuPont; he co-founded Sirenas Marine Discovery. Baran has received numerous scientific awards and honors, including being inducted as a fellow into both the Royal Society of Chemistry (2013) and the American Association for the Advancement of Science (2012). Last year, Baran was named as a recipient of a prestigious MacArthur Fellowship (2013), and he is a recipient of the American Chemical Society Award in Pure Chemistry (2010). Other awards include an Alfred P. Sloan Foundation fellowship (2006-2008), the Sackler Price (2009), the National Fresenius Award (2007), a Beckman Young Investigator Award (2006), and numerous awards from industrial sources, including Amgen, DuPont, AstraZeneca, Eli Lilly, Bristol-Myers Squibb, Novartis, and Pfizer, among others.



Recent Speakers

Thank you to all of our recent seminar speakers! Your willingness to share your experiences and research inspires our department!

Fall 2012

Conor Thomas (CHM ACS '10)

Ph.D. Program, Department of Chemistry, Princeton University,
"Using Surface Chemistry to Improve Organic-Inorganic Interfaces"

Prof. William T. Winter

Director of the Cellulose Research Institute, SUNY ESF
"Biomass Utilization: It's more Than Just Fuel"

Spring 2013

Prof. Andrew S. Murkin

Department of Chemistry, University at Buffalo
"Enzymatic Transition States: Blueprints for Potent-Drug Design"

Dr. Muris Kobašlija (CHM '02)

Associate Supply Chain Director, Bristol-Myers Squibb
"The Business, Science and Art of Biologics Manufacturing"

Fall 2013

Brian R. Donovan (CHM ACS '11)

Ph.D. Program, School of Polymers and High Performance Materials, University of Southern Mississippi
"Mussel Inspired Thiol-Ene Adhesives and Polyacrylonitrile-based Precursors for Carbon Fiber"

Prof. Christine S. Chow

Department of Chemistry, Wayne State University
"Beyond A, C, G, and U"

Prof. David W. Ball

Department of Chemistry, Cleveland State University
"Science, Skepticism, and the Benefits of Random Knowledge"

Spring 2014

Zackary Falls (CHM ACS '12)

Ph.D. Program, Department of Chemistry, University at Buffalo
"Dynamic Equilibria and Interactions in Cp₂ZrMe₂-MAO (methylaluminoxane)-Catalyzed Heterogeneous Olefin Polymerization"

Prof. Jared Paul (CHM ACS '00)

Department of Chemistry, Villanova University
"An Unexpected Journey: How the Quest for Understanding Ligand Effects in Water Oxidation Catalysis Led to a New Research Direction and a Fitting Tribute"

Ha, Ha! Very Funny

A small piece of sodium that lived in a test tube fell in love with a Bunsen burner. "Oh Bunsen, my flame," the sodium pined, "I melt whenever I see you." The Bunsen burner replied, "It's just a phase you're going through."

Teacher: What is the formula for water?

Student: H, I, J, K, L, M, N, O

Teacher: That's not what I taught you.

Student: But you said the formula for water was H to O.

Why did the chemist coat his shoes with silicone rubber? He wanted to reduce his carbon footprint.

Senior Awards

Each year the Department of Chemistry and Biochemistry bestows the following awards on graduating seniors:

WNY ACS Student General Excellence Award: Highest award given by the department; the recipient is acknowledged for outstanding achievement and significant research accomplishments.

American Institute of Chemists Chemistry Award: Recognition on the basis of a demonstrated record in leadership ability, character, scholastic achievement, and advancement potential in the chemical professions.

Gerald Zon (formerly Merck) Undergraduate Research Award: Recognizes significant research accomplishments.

V. A. Ruszkiewicz Award: Recognition of superlative academic achievement demonstrated by the highest GPA in the department.

2012 Award Winners

Andrew Forrestel

V. A. Ruszkiewicz Award
WNY ACS Student General Excellence Award in Chemistry
Merck Undergraduate Research Award

Jessica Stachowski

WNY ACS Student General Excellence Award in Chemistry
Merck Undergraduate Research Award

Russell Algera

American Institute of Chemists Chemistry Award
Merck Undergraduate Research Award

Matthew Schuler

American Institute of Chemists Biochemistry Award

Zackary Falls

Merck Undergraduate Research Award

Derek Zemla

Merck Undergraduate Research Award

2014 Award Winners

Adam Dannenhoffer

WNY ACS Student General Excellence Award in Chemistry
Gerald Zon Undergraduate Research Award

John Heck

American Institute of Chemists Chemistry Award
Gerald Zon Undergraduate Research Award

Kristin Hill

V. A. Ruszkiewicz Award
American Institute of Chemists Biochemistry Award
Gerald Zon Undergraduate Research Award

Nicholas Pantano

WNY ACS Student General Excellence Award in Biochemistry
Gerald Zon Undergraduate Research Award

2013 Award Winners

Marshall Binns

Merck Undergraduate Research Award

Jesse Fodero

American Institute of Chemists Biochemistry Award
Merck Undergraduate Research Award

David Fortman

WNY ACS Student General Excellence Award in Chemistry
Merck Undergraduate Research Award

Elisabeth Geyer

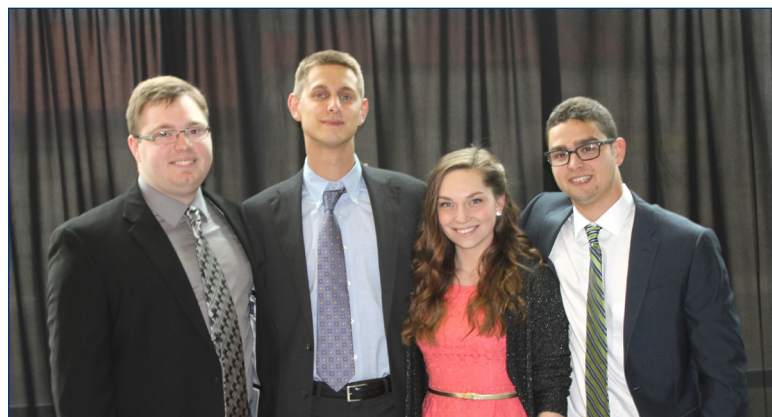
V. A. Ruszkiewicz Award
WNY ACS Student General Excellence Award in Biochemistry
Merck Undergraduate Research Award

Jamie Hitro

American Institute of Chemists Chemistry Award
Merck Undergraduate Research Award

Justin Young

Merck Undergraduate Research Award



2014 Award Winners



Where They are Now

Class of 2012

Russell Algera (CHM ACS, MAT minor): Ph.D. Program, Department of Chemistry, Cornell University

Ryan Bolt (CHM HT): Medical School, Edward Via College of Osteopathic Medicine

Dillon Brown (BCH): Pharmacy School, University of New England College of Pharmacy

Jacob Castiglia (BCH): M.Sc. Program, Roswell Park

Michael Daddario (CHM HT): M.Sc. Program, Roswell Park

Maria Eugenio (CHM HT): Middle School Science Teacher in TX

Zackary Falls (CHM ACS): Ph.D. Program, Department of Chemistry, University at Buffalo

Andrew Forrestel (CHM HT): Medical School, University of Rochester

Syed Haseeb (BCH): Medical School, American University of the Caribbean

Collin Lynch (BCH, BUS minor): Pharmaceutical Sales

Stuart MacKay (BCH)

Joseph Nason (CHM ACS)

Justin Rommel (CHM HT)

Sarah Rowe (CHM HT): Nursing School, University of Rochester

Matthew Schuler (BCH ACS): MBA Program, Canisius College

Jessica Stachowski (CHM ACS): Ph.D. Program, Department of Chemistry, University of Michigan

Derek Zemla (CHM ACS, PHY minor): Chemical Engineering Program, University at Buffalo

Class of 2013

Emily Carpenter (CHM ACS, CRJ minor): Ph.D. Program, Department of Chemistry, Syracuse University

Ammar Alsalahi (BCH)

Amanda Baun (BCH): Pharmacy School, Roseman University of Health Sciences

Allison Binkley (BCH): Pharmacy School, University at Buffalo

Jordan Cinquino (BCH): Medical School, Lake Erie College of Osteopathic Medicine

Vincent Croglia (BCH, BUS minor): Medical School, Lake Erie College of Osteopathic Medicine

Corey Damon (BCH ACS, Bus Minor): Ph.D. Program, Department of Chemistry, Univeresity at Buffalo

Jesse Fodero (BCH, SPA minor): Medical School, University at Buffalo

David Fortman (CHM ACS, PHY minor): Ph.D. Program, Department of Chemistry, Cornell University

Beau Froebel (CHM HT, BUS minor): Medical School, University at Buffalo

Elisabeth Geyer (BCH): Ph.D. Program, Department of Molecular Biophysics, University of Texas Southwestern Medical Center

Joshua Gorski (BCH): Medical School, SUNY Downstate Medical Center

Jamie Hitro (CHM HT): Jesuit Volunteer Corps

Maria Lee Higgins (CHM HT): Pharmacy School, University at Buffalo

Christopher Petrotto (BCH, ECO minor): Dental School, University at Buffalo

Elora Supersad (BCH, PSY minor)

Where They are Now

Class of 2013, cont.

David Szczur (CHM HT): M.S. Program, Department of Chemistry, University at Buffalo

John Twarog (BCH): M.S. Program Public Health, Georgia Southern University

Michael Walia (CHM HT)

Nicholas Wodo (BCH) Nursing School, University of Rochester

Justin Young (CHM ACS, PHY minor): Ph.D. Program, Department of Chemistry, University of Rochester

Miranda Zagorski (BCH): M.S. Program, Health and Wellness, Canisius College

Kristin Hill (BCH ACS): Ph.D. Program, Department of Pharmaceutical Sciences, University at Buffalo

Morgan Jankowski (CHM ACS): Chemist, Plesh Contract Packaging

Morgan Lebrecht (CHM HT): Pharmacy School, University at Buffalo

Bryan Murzynowski (CHM)

Redwan Muzahid (BCH)

Michelle Osiemi (BCH)

Joshua Owen (CHM ACS)

Nicholas Pantano (BCH ACS): Medical School, University at Buffalo

Class of 2014

Allison Altman (CHM HT): Pharmacy School, University at Buffalo

Marshall Binns (CHM)

Kevin Brick (CHM ACS): Law School, Michigan State University

Charisse Chehovich (BCH): Pharmacy School, University at Buffalo

Adam Dannenhoffer (CHM ACS): Ph.D. Program, Department of Materials Science, Northwestern University

Dennis Elsenbeck (CHM HT)

Rachael Farley (BCH): Medical School, Lake Erie College of Osteopathic Medicine

Amanda Fleck (CHM HT): Medical School, LECOM

John Heck (CHM ACS): Quality Control Analyst, Sigma-Aldrich Fine Chemicals

Reena Patel (BCH, CHM HT): Dental School, University at Buffalo

Christopher Ralyea (CHM HT): Dental School Technician, University at Buffalo

Jazmine Robinson (CHM HT): Volunteer for AmeriCorps

Kyle Uebler (CHM HT): Pharmacy School, University at Buffalo



2014 Seniors

Faculty and Student Presentations*

R. F. Algera, D. J. Fortman, and T. M. Gregg, “Cyclopropanation-Cross-Coupling Strategy for the Synthesis of Chiral Alkylidene Cyclopropanes,” 243rd ACS National Meeting, San Diego, CA, 2012.

Z. M. Falls, J. E. Hitro, and J. L. Steinbacher, “Synthesis of Stimuli-Responsive Linkers for Use in Multifunctional, Silica Drug-Delivery Agents,” 5th ACS Western New York Section Undergraduate Research Symposium, Canisius College, NY, 2012.

M. K. L. Binns, J. P. Young, and P. M. Sheridan, “Fourier Transform Microwave Spectroscopy of Alkali Metal Hydrosulfides: Detection of KSH,” 5th ACS Western New York Section Undergraduate Research Symposium, Canisius College, NY, 2012.

E. A. Geyer and S. E. Evans, “What Makes Lyme Disease Tick? Preparation and Characterization of the Global Regulator, BosR,” 5th ACS Western New York Section Undergraduate Research Symposium, Canisius College, NY, 2012.

R. F. Algera, D. J. Fortman, and T. M. Gregg, “Cyclopropanation-Cross-Coupling Strategy for the Synthesis of Chiral Alkylidene Cyclopropanes,” 5th ACS Western New York Section Undergraduate Research Symposium, Canisius College, NY, 2012.

J. E. Hitro, J. A. Heck, J. A. Binns, Z. M. Falls, and J. L. Steinbacher, “Stimuli-Responsive Linkers for use in Silica Theranostic Materials and Application to ^{19}F MRI ‘Switch-On’ Imaging,” 244th ACS National Meeting, Philadelphia, PA, 2012.

J. E. Hitro, J. A. Heck, J. A. Binns, Z. M. Falls, and J. L. Steinbacher, “Stimuli-Responsive Linkers for use in Silica Theranostic Materials and Application to ^{19}F MRI ‘Switch-On’ Imaging,” 38th ACS Northeastern Regional Meeting, Rochester, NY, 2012.

E. A. Geyer and S. E. Evans, “What Makes Lyme Disease Tick? Preparation and Characterization of the Global Regulator, BosR,” 38th ACS Northeastern Regional Meeting, Rochester, NY, 2012.

P. M. Sheridan, **M. K. L. Binns, J. P. Young,** M. P. Bucchino, and L. M. Ziurys, “Fourier Transform Microwave Spectroscopy of Alkali Metal Hydrosulfides: Detection of KSH,” 67th International Symposium on Molecular Spectroscopy, Columbus, OH, 2012.

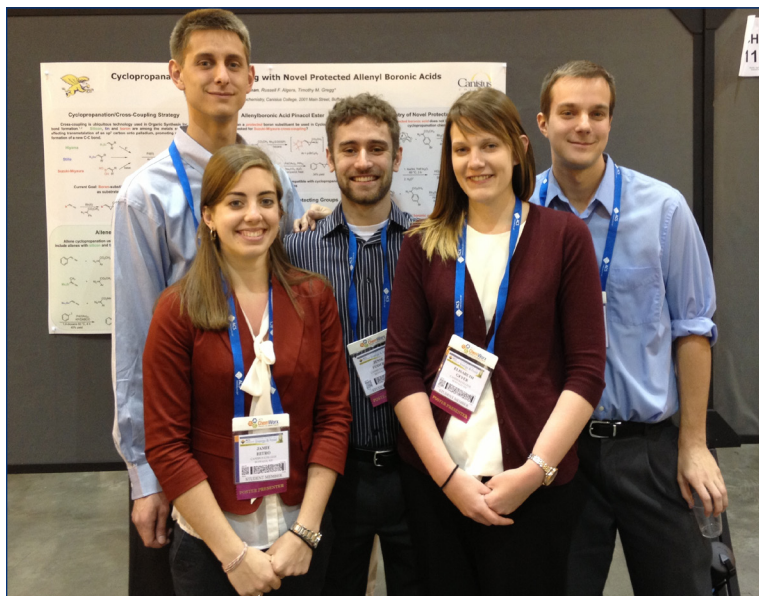
E. A. Geyer and S. E. Evans, “What Makes Lyme Disease Tick? Preparation and Characterization of the Global Regulator, BosR,” 245th ACS National Meeting, New Orleans, LA, 2013.

D. J. Fortman, R. F. Algera, and T. M. Gregg, “Cyclopropanation-Cross-Coupling Strategy Employing Novel Protected Allenyl Boronic Acids,” 245th ACS National Meeting, New Orleans, LA, 2013.

A. Dannenhoffer, N. Pantano, S. Szczepankiewicz, and M. Kozik, “P-31 DOSY NMR Evidence for Oligomer Formation by Transition Metal Substituted Polyoxometalates in Nonpolar Solvents,” 245th ACS National Meeting, New Orleans, LA, 2013.

J. E. Hitro, J. A. Heck, J. A. Binns, and J. L. Steinbacher, “Synthesis of Stimuli-Responsive Linkers for Use in Multifunctional, Silica Drug-Delivery Agents,” 6th ACS Western New York Section Undergraduate Research Symposium, Niagara University, NY, 2013.

J. P. Young, P. M. Sheridan, M. P. Bucchino, and L. M. Ziurys, “Millimeter-Wave Spectroscopy of IZnCH_3 ,” 6th ACS Western New York Section Undergraduate Research Symposium, Niagara University, NY, 2013.



2013 ACS National Meeting, New Orleans

Faculty and Student Presentations, continued

D. J. Fortman, R. F. Algera, and T. M. Gregg, "Cyclopropanation-Cross-Coupling Strategy Employing Novel Protected Allenyl Boronic Acids", 6th ACS Western New York Section Undergraduate Research Symposium, Niagara University, NY, 2013.

M. P. Bucchino, **J. P. Young,** P. M. Sheridan, D. W. Ewing, and L. M. Ziurys, "Further Studies of Potassium-Bearing Molecules: The Millimeter-Wave Spectrum of KSH (X^1A')", 68th International Symposium on Molecular Spectroscopy, Columbus, OH, 2013.

M. P. Bucchino, **J. P. Young,** P. M. Sheridan, and L. M. Ziurys "Laboratory Detection of $IZnCH_3$ (X^1A_1): Further Evidence for Zinc Insertion," 68th International Symposium on Molecular Spectroscopy, Columbus, OH, 2013.

S. E. Evans, "Pursuing Academic Positions at Undergraduate Institutions," Invited Lecture for Postdoctoral Fellow Association, University at Buffalo, NY, 2013.

C. Trueman and P. M. Schaber, "Hit and Run and the Case of the Fatigue Pins: Introducing Analytical Chemistry Across the Curriculum Using the Case Study Approach," 247th ACS National Meeting, Dallas, TX, 2014.

J. L. Steinbacher and C. C. Landry, "Adsorption and Release of siRNA from Porous Silica," 247th ACS National Meeting, Dallas, TX, 2014.

J. A. Heck, J. E. Hitro, J. A. Binns, J. M. Schnitter, and J. L. Steinbacher, "Synthesis of Stimuli-Responsive Linkers for Use in Silica Multifunctional Drug-Delivery Agents," 247th ACS National Meeting, Dallas, TX, 2014.

J. L. Steinbacher, **J. E. Hitro, J. A. Heck, J. A. Binns,** and **J. M. Schnitter,** "Toward a Multifunctional ^{19}F MRI Contrast Agent Based on Mesoporous Silica Nanoparticles," 247th ACS National Meeting, Dallas, TX, 2014.

A. Cherny, L. Evans, A. Fleck, E. A. Geyer, and S. E. Evans, "What Makes Lyme Disease Tick? Impact of BosR Mutations on its DNA Binding Properties," 247th ACS National Meeting, Dallas, TX, 2014.

A. Dannenhoffer, S. Sweeney, M. Kozik, and S. Szczepankiewicz, "Characterization of Transition Metal Substituted Polyoxometalates in Aprotic Solvents and Their Activity Toward Carbon Dioxide Reduction," 247th ACS National Meeting, Dallas, TX, 2014.

J. L. Steinbacher, **J. E. Hitro, J. A. Heck, J. A. Binns,** and **J. M. Schnitter.** "Toward a Multifunctional ^{19}F MRI Contrast Agent Based on Mesoporous Silica Nanoparticles," 7th ACS Western New York Section Undergraduate Research Symposium, University at Buffalo, NY, 2014.

D. Clouthier, R. Grimminger, B. Jin, and P. Sheridan, "The X_2BO and X_2BS ($X =$ Hydrogen or Halogen) Free Radicals," 69th International Symposium on Molecular Spectroscopy, Columbus, OH, 2014.

M. Bucchino, **J. Young,** P. Sheridan, and L. Ziurys, "Millimeter-wave Studies of the Isotopologues of $IZnCH_3$ (X^1A_1): Geometric Parameters and Evidence for Zinc Insertion," 69th International Symposium on Molecular Spectroscopy, Columbus, OH, 2014.

*Canisius Undergraduates in Bold



2014 ACS National Meeting, Dallas

Peer-Reviewed Publications*

P. M. Schaber, J. E. Larkin, H. A. Pines, **K. Berchou, E. Wierchowski, A. Marconi, and A. Suriani**, "Supercritical Fluid Extraction versus Traditional Extraction of Caffeine from Tea Leaves: A Laboratory Based Case Study for an Organic Chemistry Course," *J. Chem. Educ.* **2012**, 89, 1325.

T. N. Perkins, A. Shukla, P. M. Peeters, J. L. Steinbacher, C. C. Landry, S. L. Macura, C. Steele, N. L. Reynaert, E. F. M. Wouters, and B. T. Mossman, "Differences in Gene Expression and Cytokine Production by Crystalline vs. Amorphous Silica in Human Lung Epithelial Cells," *Particle and Fibre Toxicology* **2012**, 9, 6.

J. L. Steinbacher, Y. Lui, B. P. Mason, W. L. Olbricht, and D. T. McQuade, "Simplified Mesofluidic Systems for the Formation of Micron to Millimeter Droplets and the Synthesis of Materials," *J. Flow Chem.* **2012**, 2, 56.

S. A. Macura, J. M. Hillegass, J. L. Steinbacher, et al., "A Multifunctional Mesothelin Antibody-tagged Microparticle Targets Human Mesotheliomas," *J. Histochem. Cytochem.* **2012**, 60, 658.

L. Z. Miller, J. L. Steinbacher, T. I. Houjeiry, A. R. Longstreet, K. L. Woodberry, B. F. Gupton, B. H. Chen, R. Clark, and D. T. McQuade, "Controlled Synthesis of Silica Capsules: Taming the Reactivity of SiCl_4 Using Flow and Conditions," *J. Flow Chem.* **2012**, 2, 92.

X. Liu, N. Waight, R. Gregorius, E. Smith, and M. Park, "Developing Computer Model-Based Assessment of Chemical Reasoning: A Feasibility Study," *Journal of Computers in Mathematics and Science Teaching* **2012**, 31, 259.

M. P. Bucchino, P. M. Sheridan, **J. P. Young, M. K. L. Binns, D. W. Ewing, and L. M. Ziurys**, "Trends in Alkali Metal Hydrosulfides: A Combined Fourier Transform Microwave/Millimeter-Wave Spectroscopic Study of KSH (X^1A')," *J. Chem. Phys.* **2013**, 139, 214307.

T. M. Gregg, J. B. Keister and S. T. Diver, "Inhibitory Effect of Ethylene in Ene–Yne Metathesis: The Case for Ruthenacyclobutane Resting States," *J. Am. Chem. Soc.* **2013**, 135, 16777.

I. Bruhova, T. Gregg, and A. Auerbach, "Energy for Wild-Type Acetylcholine Receptor Channel Gating from Different Choline Derivatives," *Biophys. J.* **2013**, 104, 565.

K. M. Chepiga, C. Qin, J. S. Alford, S. Chennamadhavuni, T. M. Gregg, J. P. Olson and H. M. L. Davies, "Guide to Enantioselective Dirhodium(II)-Catalyzed Cyclopropanation with Aryldiazoacetates," *Tetrahedron* **2013**, 69, 5765.

R. M. Gregorius, "Linking Animation Design and Usage to Learning Theories and Teaching Methods," in *Pedagogic Roles of Animations and Simulations in Chemistry Courses*, J. P. Juitts & M. Sanger, Eds. ACS Symposium Series, **2013**, 1142, 77.

N. Waight, X. Liu, R. M. Gregorius, E. Smith, and M. Park, "Teacher Conceptions and Approaches Associated with an Immersive Instructional Implementation of Computer-based Models and Assessment in a Secondary Chemistry Classroom," *Int. J. Sci. Educ.* **2013**, 36, 467.

S. A. Macura, J. L. Steinbacher, et al., "Microspheres Targeted With a Mesothelin Antibody and Loaded With Doxorubicin Reduce Tumor Volume of Human Mesotheliomas in Xenografts," *BMC Cancer* **2013**, 13, 400.

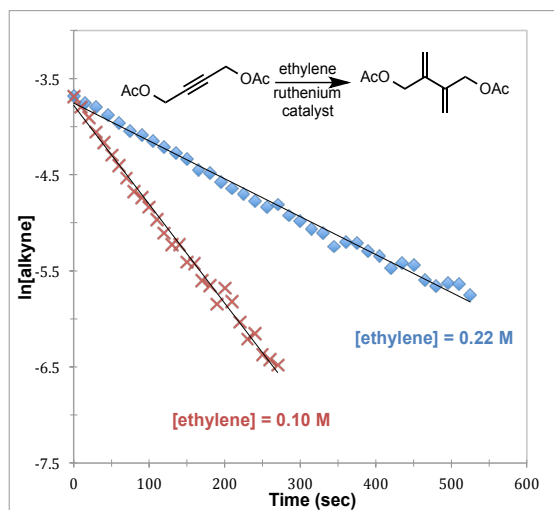
J. L. Steinbacher and C. C. Landry, "Adsorption and Release of siRNA from Porous Silica," *Langmuir* **2014**, 30, 4396.

R. Grimminger, P. M. Sheridan, and D. J. Clouthier, "An Experimental and *Ab Initio* Study of the Electronic Spectrum of the Jet-Cooled F_2BO Radical," *J. Chem. Phys.* **2014**, 140, 164302.

A. Dannenhoffer, J. Baker, N. Pantano, J. Stachowski, D. Zemla, W. Swanson, E. Zurek, S. Szczepankiewicz, and M. Kozik, "Dimerization of Cobalt-Substituted Keggin Phosphotungstate, $[\text{PW}_{11}\text{O}_{39}\text{Co}(X)]^5-$ in Nonpolar Solvents," *J. Coord. Chem.* **2014**, 67, 2830.

*Canisius Undergraduates in Bold

Faculty Sabbaticals

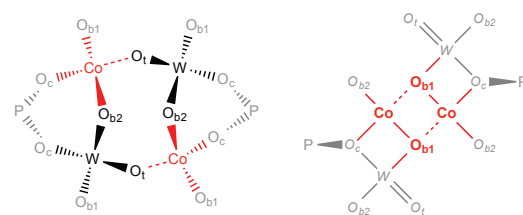


Tim Gregg (Fall 2012, Spring 2013):

My sabbatical saw me working on a research project in the Department of Chemistry at University at Buffalo, in collaboration with Dr. Steven Diver, studying the reaction kinetics of ethylene-alkyne metathesis reactions. This project grew from prior work indicating that a better understanding of the mechanism of the reaction would help optimize reaction conditions to give better yield while using less catalyst. Kinetics data were collected using a ReactIR instrument, measuring reaction rates at different concentrations of reactants, including different partial pressures of ethylene. The ReactIR is a convenient way to monitor reactive species in real time. We found an inverse rate effect of ethylene concentration (reaction rate goes down as ethylene concentration increases), which flies against common understanding for such reactions, using ethylene metathesis, where it is logical that more ethylene leads to faster reaction. The results of this work have been published in the Journal of the American Chemical Society.

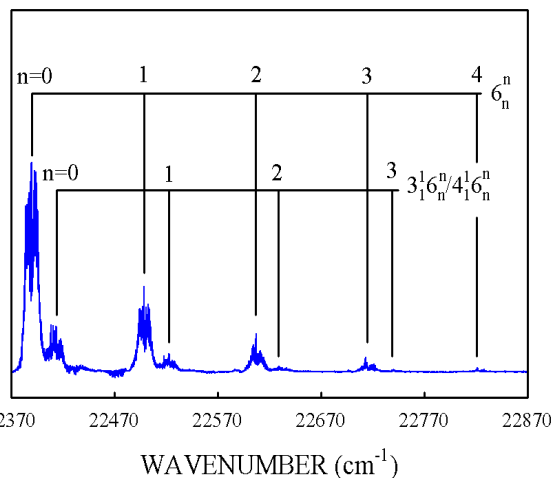
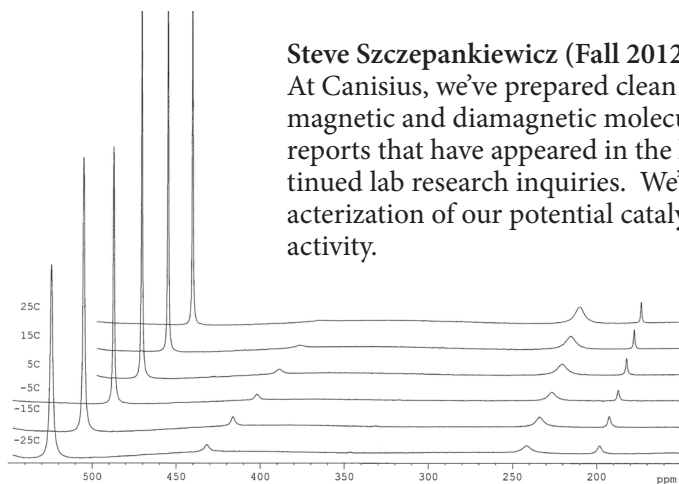
Mariusz Kozik (Spring 2013):

I spent my sabbatical at University at Buffalo in the lab of the theoretical chemist, Professor Eva Zurek. In collaboration with Professor Zurek I began a new area of computational research, the application of Density Functional Theory to transition-metal substituted polyoxotungstates in nonpolar solvents. The results of this research are included in my latest publication in the Journal of Coordination Chemistry.



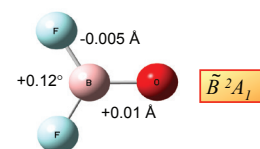
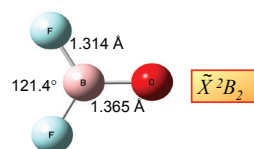
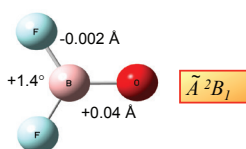
Steve Szczepankiewicz (Fall 2012):

At Canisius, we've prepared clean ^{31}P NMR spectra that clearly show paired interactions between paramagnetic and diamagnetic molecules. While not unprecedented, this dimerization resolves conflicting reports that have appeared in the literature within the last 20 years and opens several avenues for continued lab research inquiries. We've since made several noteworthy advances in electrochemical characterization of our potential catalysts, as well as developed mechanistic details for their photochemical activity.



Phil Sheridan (Fall 2013):

My sabbatical was spent in the Department of Chemistry at the University of Kentucky working in the laboratory of Professor Dennis Clouthier. The research that I conducted involved the characterization of gas-phase, boron-containing radicals by laser-induced fluorescence and dispersed fluorescence spectroscopy coupled with *ab initio* calculations. These species are of interest because they are potential impurities created in the fabrication of boron-containing semiconductors. This work resulted in an extensive vibrational analysis and geometric characterization of several electronic states of the F_2BO radical and the subsequent first laboratory detection of two new radicals, F_2BS and Cl_2BS .



A Focus on Outreach

Outreach to our community not only follows the Jesuit model of service to others, but is a primary goal of the department. We aim to engender a spirit of inquiry and scientific pursuit in area youth. We strive to encourage this spirit beyond the formative years by offering these individuals continued scholarship opportunities. Finally, we encourage our students to engage in community outreach and provide opportunities so that they may multiply our overall outreach efforts and affect more young people.

Summer Science Camp: Steve Szczepankiewicz and Phil Sheridan continue to direct the very popular Summer Science Camp for Middle School Students (entering 5th – 8th grades). The 2012, 2013 and 2014 camps each enrolled a total of 300 campers! The camp continues to use hands-on activities to present a wide range of science topics, including genetics, surface tension, chemistry, magnetism, polymers, and many more. Each year approximately twenty undergraduate Canisius science majors play a major role in the camp by providing much of the direct instruction and interaction with the campers. In 2013 we started a high school internship program that allows former participants of the camp who are now in high school to assist with the preparation and direct instruction of the campers. This program has been well-received; almost 50 high school students applied for 20 intern positions in 2014! The success of the camp has been recognized by Time Warner Cable's Connect a Million Minds science outreach initiative, through the awarding of several competitive grants: \$12,000 in 2012, \$9,000 in 2013 and \$5,000 in 2014. These funds were primarily used to award financial need-based scholarships. Information about the 2015 Summer Science Camp, scheduled to take place August 3 – 7, can be found at <http://www.canisius.edu/sciencecamp/>.



2014 Science Camp Staff



2014 Science Campers

Science Olympiad: The department, with Phil Sheridan serving as Canisius coordinator, has hosted the annual Lake Erie-Niagara regional New York Science Olympiad competition since 2012. This event brings teams from over 20 local high schools together to compete in a series of 26 science themed events, including astronomy, geology, chemistry, biology, physics, and engineering. The top four high school teams then compete in the state Science Olympiad competition. The 2015 Lake Erie-Niagara regional New York Science Olympiad will take place Saturday, January 31, with events being held primarily in Science Hall.

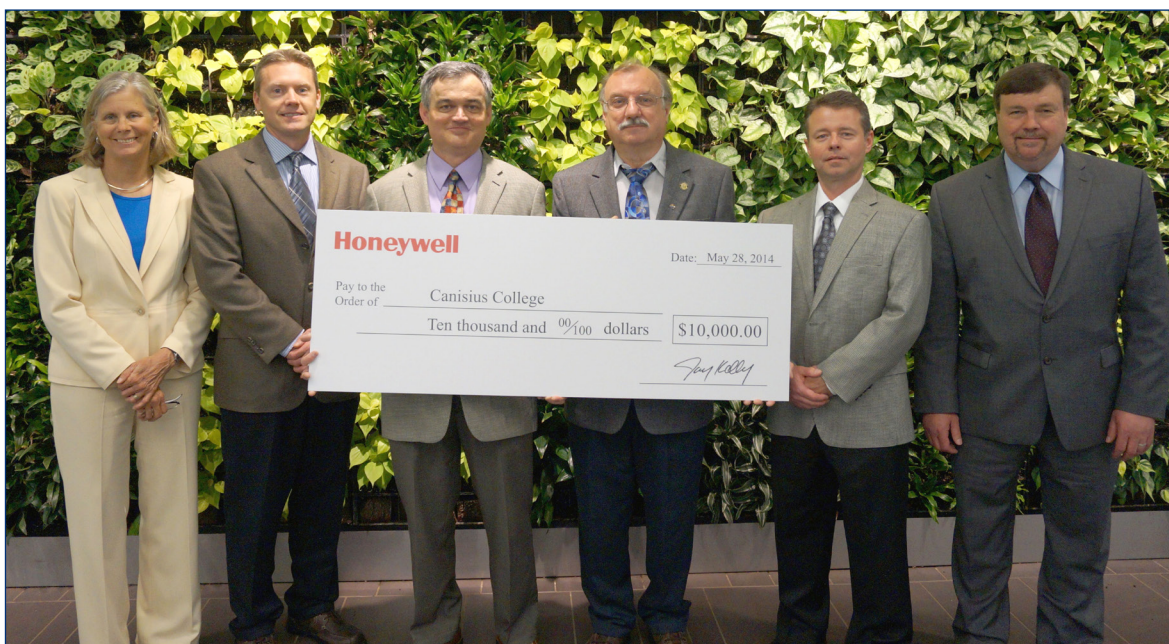


Chemistry Olympiad

U.S. National Chemistry Olympiad For Western New York high school students the Chemistry Olympiad competition starts at Canisius College, where Mariusz Kozik has been the WNY Section Coordinator since 1991. The local section exam in March is the first step for approximately 70 chemistry students from more than twenty local high schools. The top eight students are honored for their achievements at the annual Education Night dinner organized by the WNY ACS section and become eligible to take the national examination. This exam last six hours and includes a laboratory component that requires students to design their own experimental approach to accomplish a specific goal. The top twenty students in the nation, based on national examination, qualify to attend the training camp for the International Chemistry Olympiad, which is held annually at the Air Force Academy in Colorado, during two weeks in June. Following an intensive training, a team of four students is selected to represent the United States at the international competition, which in 2014 took place in Hanoi, Vietnam. WNY has been well represented over the past 20 years, with 16 students attending the training camp, 5 students participating in the international competition and two students serving as alternates on the national team.

Following the Olympiad competition in WNY, participating students are encouraged to apply for a summer research assistantship at Canisius. Two students are selected every summer, and for six weeks, these students become members of Mariusz Kozik's research group and work on the synthesis and spectroscopic characterization of various polyoxometalates.

Major funding for all Chemistry Olympiad activities in WNY comes from Honeywell's Buffalo Research Laboratory. In 2012, 2013, and 2014, Honeywell provided grants of \$10,000 each year, and since 2001 Honeywell has donated \$206,000 to the Chemistry Olympiad program in WNY.



Representatives from Honeywell International Present Mariusz Kozik with a Check for the Chemistry Olympiad

News from the Student Chapter of the ACS

The Canisius College SCACS continues to be an active part of the Department encouraging community outreach, camaraderie, and scholarship. Students and faculty have participated in a number of well-attended events including: the welcome back ice cream social, lasertron outing, National Chemistry Week “mole-asses” cookie sale, paintball outing, chemical demonstrations at local elementary schools, the annual football game with βββ (the Biology Honors Society), the wildly popular Christmas party and gift exchange, a tour of Occidental Chemical Corporation in Niagara Falls, the Valentine’s Day chocolate rose sale, Middle School Science Bowl, hosting seminar speakers, bowling night, community service days, indoor rock climbing, and the end-of-year banquet.

National ACS Awards:

- 2011-2012, Outstanding Student Chapter
- 2012-2013, Commendable Student Chapter
- 2013-2014, Commendable Student Chapter

Executive Board Members

2012-2013

- President: Jamie Hitro (CHM HT '13)
- Vice President: Adam Dannenhoffer (CHM ACS '14)
- Secretary: Miranda Zagorski (BCH '13)
- Treasurer: Nicholas Pantano (BCH ACS '14)
- Faculty Advisor: Phil Sheridan

2013-2014

- President: Adam Dannenhoffer (CHM ACS '14)
- Vice President: Jonathan Binns (CHM ACS '15)
- Secretary: Caressa Trueman (CHM HT '15)
- Treasurer: Skyler Sweeney (CHM HT '15)
- Faculty Advisors: Phil Sheridan and Jeremy Steinbacher

2014-2015

- President: Jonathan Binns (CHM ACS '15)
- Vice President: Caressa Trueman (CHM HT '15)
- Secretary: Joseph Lesh (BCH ACS '17)
- Treasurer: Lauren Evans (BCH ACS '16)
- Historian: Christian Binns (BCH ACS '17)
- Faculty Advisor: Phil Sheridan



ACS vs. βββ Football Game



Chemical Demonstration



2013 Chapter Award Presentation

Keep in Touch!

We enjoy hearing from you! There are several ways to stay connected to the Department:

Check us out on Facebook! Send a friend request to SCACS Canisius.

Visit our recently updated website at <http://www.canisius.edu/chemistry/>

We are looking to create an alumni profile page on our website. Please consider contributing a description of your professional experiences. Profile information, as well as other updated information (email address, mailing address, newsletter updates, etc.), can be sent to us using the form at:

<http://www.canisius.edu/chemistry/alumni/alumni-contact-us/>

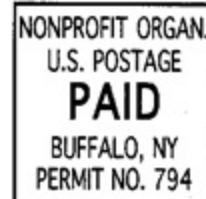
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Chemistry Banquet, May 2014



Department of Chemistry & Biochemistry
Canisius College
2001 Main Street
Buffalo, New York 14208-1035



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to see our updated website and the electronic versions of
Periodical and past newsletters, or to create an alumni profile.

