## Table of Contents

**THE CHAIR’S INTRODUCTION**............................... 5

### OUR STUDENTS

THE CHEMISTRY CLASS OF 2009............................... 9
STUDENT AWARDS..............................................13
STUDENT RESEARCH PROJECTS..............................18
CHEMISTRY CLUB 2009........................................23

### OUR FACULTY AND STAFF

THE CHEMISTRY FACULTY.....................................24
GRANTS AND PROPOSALS.....................................37
PUBLICATIONS....................................................42
PRESENTATIONS...................................................45
CHEMISTRY DEPARTMENT SEMINAR SERIES ...........52
DEPARTMENTAL GRANTS AND GIFTS......................56

### OUR ALUMNI

ALUMNI NEWS..................................................58
Aerial view of A. Paul Schaap Science Center.

North view of A. Paul Schaap Science Center and Plaza.
Dear Colleagues, Alumni and Friends,

Greetings from the Hope College Chemistry Department! As promised, we have produced an annual report that most of you are receiving electronically, while others are receiving print copies by US mail. If you would prefer to receive this report in the other format from which you currently received it, please do not hesitate to contact us by email: chemistry@hope.edu and we will switch your subscription type for subsequent years.

It has been a wonderful and eventful year for the Chemistry Department in 2009, and I will try to summarize some of the highlights in the next few pages.

Despite the national economic downturn that has challenged us all, the Chemistry Department has continued to flourish this year – our enrollments in the college remained constant and our enrollments in chemistry continued their eight-year trend of modest growth. This has enabled us to survive the economic hardships caused by the endowment loss, and thanks to some successful grant-writing and some key alumni support, we have actually done very well with respect to new instrumentation and research support. Most importantly, we hired a new faculty member to fill the inorganic chemistry position opened by Mike Silver’s retirement. Dr. Beth Anderson from the Weiss group at Pennsylvania State University will be joining us in July, and she brings a very exciting combination of cutting-edge nanomaterials research and a passion for liberal arts education to our campus. We are very pleased to attract a scientist who is such a great fit to our program to the Chemistry Department, and I look forward to sharing with you the wonderful impact she makes next year.

While on the topic of departmental personnel, it is important to note that this is the first year in last four that every member of the department was back from sabbatical, and we have taken pre-emptive measures to make sure that we never have quite such a “bulge” in sabbaticals again. As a result of having everybody engaged in on-campus activities again, we have started a very exciting discussion on curriculum reform within the Chemistry Department, and we are likely to come up with the first significant changes to our chemistry course offerings in the past forty years. This reform effort is being led by Will Polik, a recent chair of the ACS Committee on Professional Training, whose work there paved the way for more creative requirements to satisfy the ACS degree. Together with changing demographics in our introductory chemistry courses, changes in co-curricular programs such as biology, engineering and nursing, and evolving state standards in high-school preparative chemistry courses, we have new-found motivation to address the core chemistry curriculum. One big change that was approved by the Academic Affairs Committee this year was the creation of a new degree: the Biochemistry and Molecular Biology degree – a truly joint degree offering between the Chemistry and Biology Departments. Maria Hledin will be directing this new program that will attract new students to campus. The department has been very conscientious in its consideration of cost and benefit for each proposed change in the curriculum, and we will have several changes adopted by the department next year on which to report. Once again, Hope College is not going to wait for the national trends in the integration of research and education to overtake us, but the Chemistry Department plans to lead by example. We will have a real opportunity to lead the nation once again with an innovative curriculum designed to attract students from across the country, while adhering to
the highest goals for the education and professional development for our students. The
department morale and outlook remains very positive during this exciting time. I must
compliment the entire department on their enthusiasm, cohesion and sincere drive to improve
undergraduate education in chemistry.

As I reported last year, 2009 was the centennial year of separate Chemistry and
Physics Departments at Hope College, since Almond T. Godfrey took over leadership of the
fledgling Chemistry Department in 1909. We created a coffee-table book for the occasion
called “A Century of Science”, which summarizes the history of all the sciences at Hope
College, and copies are still available for purchase from the Dean’s Office
(http://www.hope.edu/academic/natsci/). In addition to the book, we had several on-campus
events and a year’s worth of invited alumni speakers back for the celebration. It is fun to look
back on a century of traditions and success, and realize that the next book on this topic will
probably be 100 years away!

Not every piece of news is positive, unfortunately – we lost several prominent
Chemistry alumni this year, which I must also report: Dr. Eugene Van Tamelen ’47, Dr.
Roger E. Koeppe ’44 and Dr. Owen J. Koeppe ’49 all passed away within a year of each
other, and all were prominent scientists and committed supporters of the Hope College
Chemistry Department. Since Hope College has such a large number of distinguished alumni
in chemistry, we are beginning to collect memorabilia to commemorate our alumni that have
had an impact in chemistry and biochemistry nationally. We already have small display
cases for Jim Neckers ’23 and Richard Smalley ’64 in Schaap Science Center, so we thought
we should make an effort to collect more tributes to our alumni and find a permanent home
for such a display within the building. If you have any appropriate items that you think
should belong in the display, please do not hesitate to contact us (chemistry@hope.edu).

We also experienced a fairly significant flood in the Schaap Science Center in June,
2009. A line of thunderstorms stalled over Holland and deposited more than seven inches of
rain in one afternoon/evening, which overwhelmed the storm water drain system on campus
(and elsewhere in Holland), and the lower floor of Schaap was flooded with about 18 inches
of dirty water. Luckily, all of the chemistry instrumentation is housed on the upper two
floors, but several departments were not so lucky, and there was over $250,000 in damage to
the lower floor. Mostly covered by insurance, the repairs were made within the summer
months, and classes opened without delay in the fall.

More exciting news will follow on the next pages – we have a very large graduating
class of 46 seniors, which will once again put us at the top of the category of liberal arts
colleges in terms of number of chemistry majors nationally. The ACS publishes the
graduation data for all ACS-certified programs in the US, and in the November 23, 2009
issue of Chemical & Engineering News, pp 38-48, Hope College is listed first among all
liberal arts colleges nationally with 44 majors, and second among all schools in the state of
Michigan behind only the University of Michigan. On the tables which begin on page 40 you
will see that we not only produce lots of very qualified chemistry majors each year, but we
have one of the leading undergraduate research programs in the nation. The department
produced 19 publications, 12 of which listed 32 undergraduate student co-authors. There are
very few institutions in the US (of any size) that could claim that 32 undergraduate chemists
had appeared on publications in a single year. In addition to the 12 ongoing grants with an
approximate value of $3,551,000 (which includes the $1,400,000 HHMI grant), there were
12 newly funded awards to the chemistry faculty during 2009 totaled approximately $1,958,000. I don’t know of any other Primarily Undergraduate Institutions that have chemistry departments that could match this total of external support. Again, the stimulus funding initiatives at the NSF were kind to us, but faculty efforts at grant-writing produced a banner year for the department. Jeff Johnson obtained a second high-field NMR for the department, and we negotiated an upgrade from Bruker to retrofit the aging Varian 400 MHz NMR at the same time, so we now have two “new” 400 MHz NMRs in operation in the department. I also obtained funding for a tabletop Scanning Electron Microscope and a Continuous Flow Injection Autoanalyzer for the department/division, and a new neutron detector array for physics, courtesy of the NSF. We recently learned of a positive NSF-CAREER grant decision for Jason Gillmore, which will provide the department a second GC-MS instrument. So in terms of research activity and instrumentation, the Chemistry Department is doing very well.

One more important aspect I will mention is the continuous and vital outpouring of support we receive from our alumni, emeritus faculty and friends. Even during these tight economic times, we received major gifts and donations that enabled us to hire more summer research students than ever before (more than 55 in 2009), and I’d like to highlight just a few of our benefactors here. Of course there are several very well-known named endowments in the chemistry department, listed on page 56 of this report that we gratefully acknowledge each year. What isn’t so obvious is that there are also many anonymous donors that just contribute directly to the “Chemistry Research Fund” or the Chemistry Research Fund endowment each year. For example, G. Clarke Borgeson ’72 annually donates generously to the endowment, or recent emeritus faculty such as Mike Silver and Don Williams who donate directly to the undergraduate research account. Even just friends of the College, such as Dr. Jadwiga Roguska-Kyts made a difference in a tight economic year by donating to support undergraduate research, and I continue to be amazed at the selfless generosity of these (and many other benefactors) of the department. Thank-you – our students definitely benefit from your kindness. If you can include West Michigan in your travel plans this year, please do stop by and visit the department – we’d love to see you and show you our program and facilities.

Hopefully, the rest of the Chemistry Department activities from 2009 will speak for themselves in the following pages, enjoy! Please feel free to provide feedback on our report format; it is designed to provide you information efficiently so if any of it doesn’t work, let me know. Best wishes from Hope College.

Graham F. Peaslee
June 2010
The A. Paul Schaap Science Center labs are used by many students each day.
Graduates 2009

Graduates with a Chemistry or Biochemistry* Major

Bechtel, Nikeata from Plainwell, MI: Degree (B.A.)

Bodden, Christin from Wheeling, IL: Degree (B.S.)

Bossenbroek, Chloe from Wyoming, MI: Degree (B.A.)

Colbert, Lauren from Fort Wayne, IN: Degree (B.A.)

Dittenhafer, Kristin from Midland, MI: Degree (B.S., ACS*)

Doyle, Kelly from Tinley Park, IL: Degree (B.S.)

Driscoll, Rachel from fishers, IN: Degree (B.S., ACS)

Eidson, Adam from Grand Haven, MI: Degree (B.A.)

Ellison, Matthew from Midland, MI: Degree (B.A.)

Eurick, Kyle from Davisburg, MI: Degree (B.A.)

Franks, Andrew from West Olive, MI: Degree (B.S., ACS)

Gibbs, Joseph from Baldwin, MI: Degree (B.S.)

Gilliland, Jake from Round Lake, IL: Degree (B.A.)

Graves, Danelle from Flushing, MI: Degree (B.A.)

Griffin, Matthew from Granger, IN: Degree (B.A.)

Griffith, Alexander from Naperville, IL: Degree (B.A.)

Heneveld, Katherine from Grand Rapids, MI: Degree (B.S. *)

Hilbrand, Ashley from Grant, MI: Degree (B.A.)

Jordan, Christopher from Pilesgrove, NJ: Degree (B.S., ACS)

Kalafut, Deanna from Justice, IL: Degree (B.S., ACS)

Kinder, Joshua from McHenry, IL: Degree (B.A.)

Knoll, Ross from Grand Haven, MI: Degree (B.A.)
Kuiper, Nora from Kalamazoo, MI: Degree (B.S.)

Ladomersky, Erik from Grandville, MI: Degree (B.A.)

LaRoche, Elise from Hudsonville, MI: Degree (B.A.)

Lewis, Jacquelyn from Rockford, MI: Degree (B.A.)

Malone, Isabel from Grand Rapids, MI: Degree (B.A.)

Merz, Carilyn from Petersburg, MI: Degree (B.A.)

Moerdyk, Jonathan from Paris, MI: Degree (B.S., ACS)

Morgan, Katherine from Sarasota, FL: Degree (B.A.)

Ogilvie, Ross from Lake Orion, MI: Degree (B.A.)

Osterbur, Lucas from Greenville, OH: Degree (B.S., ACS)

Parrish, Jonathan from Midland, MI: Degree (B.S., ACS*)

Rice, Caitlin from Spring Lake, MI: Degree (B.A.)

Richards, Jaime from Cadillac, MI: Degree (B.A.)

Schlotz, John from Saint Louis, MO: Degree (B.A.)

Scholten, Donald from Grand Rapids, MI: Degree (B.A.)

Sherburn, Stephanie from Muskegon, MI: Degree (B.A.)

Smith, Trevor from Holland, MI: Degree (B.A.)

Stegenga, Nicole from Saline, MI: Degree (B.A.)

Steiner, Brent from Leslie, MI: Degree (B.A.)

Stodola, Joseph from Jenison, MI: Degree (B.S., ACS*)

Strong, Benjamin from Grand Rapids, MI: Degree (B.S., ACS*)

Templeton, Allison from Appleton, WI: Degree (B.A.)

VanderVelde, Paul from Pasadena, CA: Degree (B.S., ACS)
Vankempen-Fryling, Rachel from Grand Rapids, MI: Degree (B.S.)*

Weidenhaft, Elizabeth from Apple Valley, MN: Degree (B.A.)

White, Zachary from Hopkins, MI: Degree (B.S., ACS*)

Wotal, Alexander from Cary, IL: Degree (B.S., ACS)

Graduates with a Chemistry Minor

Bilodeau, Alyssa from Kirkland, WA: Chemistry

Carlson, Graham from La Grange Highlands, IL: Chemistry

de Jong, D. Anders from Zeeland, MI: Chemistry

Depke, Tyler from Grayslake, IL: Chemistry

Dickinson, Jacob from Saline, MI: Chemistry

Fait, Jennifer from San Diego, CA: Chemistry

Guajardo, Phillip from Milwaukee, WI: Chemistry

Gundersen, Joanna from Bolingbrook, IL: Chemistry

Head, Miriam from Ada, MI: Chemistry

Koenig, Daniel from Midland, MI: Chemistry

Lyons, Jacob from Midland, MI: Chemistry

Nielsen, Zachary from Minneapolis, MN: Chemistry

VanderYacht, Andrew from West Olive, MI: Chemistry

Wickstra, Jason from Holland, MI: Chemistry

Willming, Morgan from Lubbock, TX: Chemistry

Wingate, Jacob from Tustin, MI: Chemistry

Wynne, Brianna from Holland, MI: Chemistry
Our Centennial Picnic 2009

Top: Tod Gugino grilling our food.

Left: Faculty and students getting their dinners.

Top: Dr. Brown and David Paul

Left: Students enjoying this event!
Chemistry Awards

Almon T. Godfrey Prize in Chemistry
An award to a senior chosen as the outstanding student in chemistry.
Jonathan P. Moerdyk

Hope Chemistry Senior for Research
Kristin E. Dittenhafer
Christopher D. Jordan
Amy L. Speelman
Joseph L. Stodola
Benjamin M. Strong

American Institute of Chemists Award
An award to a senior student who has exhibited diligence in study and research projects, helpfulness in the instructional laboratories and interest in chemistry.
Andrew T. Franks
Jacquelyn D. Lewis

Junior Chemistry Journal Award
An award of a subscription to Analytical Chemistry presented to an outstanding junior student in chemistry.
Andrew T. Franks

The Undergraduate Biochemistry Award
An award to the student who, in the judgment of the Chemistry faculty, has demonstrated outstanding performance in Biochemistry.
Scott. R. Hawken

Organic Chemistry Book Award
An award of a Merck Index presented to an outstanding student in organic chemistry.
Breanna M. Powell

First Year Chemistry Book Award
An award of a CRC Handbook presented to an outstanding student in the first year chemistry program.
John Patrick Lutz

Hope College Athletic Blanket Awards
Nora E. Kuiper
Lucas W. Osterbur
Erik R. Ladomersky
Special Senior Awards

Chemistry Senior Majors/Minors who have received special recognition for a wide range of personal achievements:

John Schouten Award  Nora E. Kuiper
Wolterink Prize in Biology  Paul M. Frybarger
                          Jeanne R. Oxendine
Patterson Memorial Prize in Biology  Ryan J. Davis
                                      Caitlin E. Rice
Catherine Morrison ’89 Sr Science Education Award Secondary  Jason M. Folkert
Pi Kappa Lambda National Music Honor Society  Joseph L. Stodola

Class of 2009 Jaecker Chemistry Scholarships

Kristin Dittenhafer  Rachel Driscoll
Adam Eidson  Matt Ellison
Joseph Gibbs  Forrest Gordon
Katherine Heneveld  Ashley Hilbrand
Christopher Jordan  Deanna Kalufut
Joshua Kinder  Nora Kuiper
Elise LaRoche  Jacquelyn Lewis
Christina Lis  Isabel Malone
Jonathan Moedyk  Sarah Moore
Ross Ogilvie  Lucas Osterbur
Jonathan Parrish  Adam Plaunt
Donald Scholten  Stephanie Sherburn
Amy Speelman  Joseph Stodola
Benjamin Strong  Rachel VanKempen
Chloe Bossenbroek  Jaime Richards
Zach White  Alexander Wotal
Phi Beta Kappa Initiates

Jonathan D. Barrus
Joshua M. Kinder
Jacquelyn D. Lewis
Joseph L. Stodola
Kristin E. Dittenhafer
Ross W. Knoll
Jonathan P. Moerdyk
Jennifer K. Fait
Nora E. Kuiper
Caitlin E. Rice

Sigma Xi Student Research Awards

Daryl Andresen
Kristin Dittenhafer
Matthew Ellison
Joseph Gibbs
Katherine Heneveld
Ross Knoll
Jacquelyn Lewis
Jonathan Moerdyk
Jonathan Parrish
Amy Speelman
Paul VanderVelde
Meghan Winer
Alyssa Bilodeau
Rachel Driscoll
Jennifer Fait
Matthew Griffin
Ashley Hilbrand
Nora Kuiper
Jacob Lyons
Ross Ogilvie
Donald Scholten
Joseph Stodola
Rachel VanKempen
Chloe Bossenbroek
Adam Eidson
Andrew Franks
Alexander Griffith
Christopher Jordan
Elise LaRoche
Isabel Malone
Lucas Osterbur
Trevor Smith
Benjamin Strong
Jonathan Barrus

Mortar Board (National Honor Society)

Shirley E. Bradley
Lauren E. Moak
Camille M. Riddering
Ki E. Chang
Carolyn E. Powers
Conrad M. Tobert

Scholarships

Cancer Federation Award
Beckman Scholarship
Barry M. Goldwater Scholarship
Barry M. Goldwater Honorable Mention
Camille M. Riddering
John N. Donkersloot
J. Mark Lunderberg
Paul M. Frybarger
**Undergraduate Summer Research Fellowships**

DeVries Fund  
Conrad Tobert

DeWitt Fund  
Bruce A. Kraay

Eli Lilly and Co.  
David P. Todd

Mulder  
Jacquelyn Burns

Neckers Fund  
Kaleb L. Topp

Riechel  
Jennifer L. Bartman

Visser Fund  
Jennifer L. Bruinius

Zwemer Fund  
Nicholas E. Rebhan

Undergraduate Research Fund  
Timothy Boman  
Joseph Brandoniso  
Christian Calyore  
Trevor Coeling  
Scott Hawkins  
Victor Kanyi  
Bryan Kunkler  
Breanna Powell  
Mary Pressler  
Aaron Welsch

**Graduate Research Fellowships**

National Science Foundation Graduate Fellowship Awards

National Science Foundation Predoctoral Fellowship Honorable Mention

National Defense Science and Engineering Graduate Fellowship
row 1: Ji-Min Jeon, Arcelia Ortega, Mary Pressler, Hao Shen, Robert Sjoholm, Sasha Balcazar, Megan Lee, Angelica Willis, Dean Moses Lee, Sara Brokus, Shirley Bradley, Brianna Powell, Valerie Winton, Sarah Havlik
row 2: Xisen Hou, Alex Ketchum, Camille Riddering, Shannon Alger, Amanda Ferguson, Patrick Lutz, Lupe Guarra, Kristi Wu, Lauren Lee, Dr. Balaji Babu, Dr. Sameer Chavda, Timothy Boman, Dr. Kenneth Brown, Dr. Graham Peaslee, Dr. Jeff Johnson
row 3: Amanda Witte, Catherine Ellis, Emily Cordes, Chas Murillo, Danielle Sillette, Jennifer Bartman, Guillermo Flores, Oscar Munoz, Rolando Barajas, Brian Kempers, Joe Habbouche, Scott Hawken, Bradley Boelkins, Bryan Kunkler, Steven Lewis, Christian Damon
row 4: Dr. Wally Fu, Amy Speelman, Lisa Alvine, Curtis Merrick, Bryce Curry, Bruce Kraay, Dr. Elizabeth Sanford, Nick Rebhan, Victor Kanyi, Conrad Tobert, Trevor Coeling, Dr. Jason Gillmore, Michael Parrish, Timothy Shannon, Pieter Norden
row 5: Kaleb Topp, Ki Chang, Jide Banks, Mazi Condelee, Kent Kammermeier, Dr. Sheldon Wettsack, Aaron Welsch, Dr. Leah Chase, Dr. Michael Pikaart, Joshua Borycz, Christian Calyore, John Donkerson, Raymond Strobel, David Todd, Dr. Brent Krueger, Joe Brandonisio, Eric Lauzon
Emily Vogel, (Brown) Electrochemistry on Disposable and Ceramic-Based Electrodes

Anne Son, (Brown) Detection of Glucosinolates from Plant Extracts

Olajide Banks, (Brown) Characteristics of Macroporous and Screen Imprinted Electrodes

Bruce Kraay, (Brown) Electrode Film Dynamics and Electropolymerization

Shirley Bradley, (Hledin) The Antiangiogenic Effect of VACM-1 Protein in Rat Endothelial Cells is Regulated by its Neddylation and/or Phosphorylation Status

Jeanne Oxendine, (Hledin) Isolation and characterization of VACM-1 specific ligand

Joseph Stodola, (Hledin) VACM-1 dependent processing of provasopressin

Steven Lewis, (Hledin) Regulation of VACM-1 expression by resveratrol

Bryan Kunkler, (Hledin) Expression of VACM-1 mutants in endothelial cells induces apoptosis

Angelica Willis, (Hledin) Regulation of Estrogen Induced Growth in cancer cells by VACM-1

Dannelle Graves, (Hledin) Regulation of VACM-1 expression by Resveratrol

Lida Dabney, (Hledin) Co localization of VACM-1 and Nedd-8 in endothelial cells

Joe Habbouche, (Hledin) Regulation of VACM-1 expression by antiangiogenic drugs

Jackie Burns, (Hledin) Site directed mutagenesis of VACM-1 cDNA

Bryan Kempers, (Hledin) Characterization of anti-VACM-1 antibodies

Daniel Salamango, (Hledin) Regulation of VACM-1 expression by Thalidomide

Stephanie Sherburn, (Chase) Trafficking of System xc- is Affected by Cell Culture Density

Ashley Hilbrand, (Chase) Probing the Mechanism of ODAP Neurotoxicity in Human Glioma Cells

Ki Chang, (Chase) Probing the Mechanism of Neurotoxicity in Living Rats

Mazi Condelee, (Chase) Probing the Mechanism of Neurotoxicity in Living Rats

Aaron Welsch, (Chase) Probing the Mechanism of Neurotoxicity in Living Rats
Kimberly Boyd, (Chase) Real-time Studies of System xc- Trafficking in Human Glioma cells

Aja Nash, (Chase) Constitutive and Regulated Trafficking of the Cystine/Glutamate Exchanger, System xc-

Michael Parrish, (Chase) Constitutive and Regulated Trafficking of the Cystine/Glutamate Exchanger, System xc-

Lisa Alvine, (Chase) Constitutive and Regulated Trafficking of the Cystine/Glutamate Exchanger, System xc-

Anne Georges, (Chase) Identification of Trafficking Domains in xCT

Aaron Welch, (Gillmore) Comparison of routes to N-allyldinitronaphthalimide

Daniel Haywood, (Gillmore) Attempted synthesis of a methoxy-substituted quinazolinespirohexadienone

Trevor Coeling, (Gillmore) Synthesis toward carbonyl-substituted PSHD analogs

Jonathan Moerdyk, (Gillmore) Electrochemistry of quinazolinespirohexadienones (N,N-bridged quinoline analogs of PSHDs)

Scott Hawken, (Gillmore) Synthesis toward oxazinoquinolinespirohexadienones (N,O-bridged quinoline analogs of PSHDs)

Amy Speelman, (Gillmore) Computational modeling of organic reduction potentials

Bryce Curry, (Gillmore) Computational modeling of organic reduction potentials

Chas Murillo, (Gillmore) Computational modeling of organic reduction potentials

Tim Shannon, (Gillmore) Synthesis toward oxazinoquinolinespirohexadienones (N,O-bridged quinoline analogs of PSHDs)

XiSen Hou, (Gillmore) Synthesis toward carbonyl-substituted PSHD analogs

Ben Pollock, (Gillmore) Synthesis toward oxazinoquinolinespirohexadienones (N,O-bridged quinoline analogs of PSHDs), with Prof Dan Stanford (Harper College)

Jonathan Parrish, (Johnson) Investigating the Mechanism of Rhodium-Catalyzed Carbon-Carbon Bond Activation

Alexander Wotal, (Johnson) Carbon Carbon Single Bond Activation by Rhodium (I) Catalysis

Sarah Havlik, (Johnson) Nickel-Mediated Decarboxylative Alkylation of Cyclic Imides
Valerie Winton, (Johnson) Investigation of Palladium-Catalyzed C-C Bond Activation in Tertiary Alcohols

Christian Calyore, (Krueger) Bulk and single-molecule fluorescence spectroscopy of fluorescently labeled DNA and RNA oligonucleotides

Catherine Ellis, (Krueger) Development and Implementation of a workshop for high school teachers to improve understanding of CSM in high school students

Paul Frybarger, (Krueger) Bulk and single-molecule fluorescence spectroscopy, as well as computational modeling of fluorescently labeled DNA and RNA oligonucleotides

Christine Gobrogge, (Krueger) Bulk fluorescence spectroscopy of fluorescently labeled DNA and RNA oligonucleotides

Eric Gobrogge, (Krueger) Bulk fluorescence spectroscopy of fluorescently labeled DNA and RNA oligonucleotides

Jacquelyn Lewis, (Krueger) Bulk and single-molecule fluorescence spectroscopy of fluorescently labeled DNA and RNA oligonucleotides

Arcelia Ortega, (Krueger) Computational modeling of fluorescently labeled DNA and RNA oligonucleotides

Amy Speelman, (Krueger) Bulk and single-molecule fluorescence spectroscopy, as well as computational modeling of fluorescently labeled DNA and RNA oligonucleotides

Allison Templeton, (Krueger) Bulk fluorescence spectroscopy of fluorescently labeled DNA and RNA oligonucleotides

Conrad Tobert, (Krueger) Bulk and single-molecule fluorescence spectroscopy of fluorescently labeled DNA and RNA oligonucleotides

Bradley M. Boelkins, (Mungall) Synthesis of Thermally Stable Ladder Polymers by the Polymerization of Benzocyclobutane Derivatives

Rolando Barajas, (Peaslee) Construction and Calibration of a Sediment Trap

Jennifer Bartman, (Peaslee) Macatawa Watershed Sediment Identification

Joshua Borycz, (Peaslee) Cathodoluminescent Signatures of Neutron Irradiation

Sarah Brokus, (Peaslee) Cathodoluminescent Signatures of Neutron Irradiation

Brian Dess, (Peaslee) Ion Beam Induced Luminescence of Glass

Amanda Gernentz, (Peaslee) Macatawa Watershed Sediment Identification
Kristen Hasbrouck, (Peaslee) Cathodoluminescent Signatures of Neutron Irradiation

Matthew Keller, (Peaslee) Differential PIXE Analysis of Paint

Eric Lunderberg, (Peaslee) MoNA Experimental & Forensic Glass Analysis

J. Mark Lunderberg, (Peaslee) Ion Beam Induced Luminescence of Feldspars

Andrew McCubbin, (Peaslee) Differential PIXE Analysis of Paint

Tim Nagi, (Peaslee) Radiodating of Sediments

Danielle Silletti, (Peaslee) Cathodoluminescent Signatures of Neutron Irradiation

Morgan Smith, (Peaslee) Radiodating of Sediments

Kiley Spirito, (Peaslee) PIXE Analysis of Lake Sediment

Zach White, (Pikaart) Gata-1 expression in MEL cells

Christian Damon, (Pikaart) Gata-1 transactivation in nonerythroid cells

John Donkersloot, (Pikaart) Histone H2B in Giardia

Lupe Guerra, (Pikaart) Histone H2B in Giardia

J. Patrick Lutz, (Pikaart) Gata-1 transactivation in nonerythroid cells

Joseph Brandonisio, (Pikaart) Copper and slow-sand filtration

Victor Kanyi, (Pikaart) Copper and slow-sand filtration

Kent C. Kammermeir, (Polik) Construction of a Free-Jet Pulsed Discharge Nozzle for Radical Production

Alex Ketchum, (Sanford) Preparation of Highly Conjugated Thiophenes

Kaleb Topp, (Sanford) Preparation of Highly Conjugated Thiophenes

Ji-Min Jeon, (Sanford) The Preparation of Small Molecules for Device Applications

Emily Vogel, (Sanford) Synthetic Investigation into the Preparation of Thiophene Monomers

Eric Lauzon, (Sanford) Preparation of Highly Conjugated Thiophenes
Summer Research Symposium 2009

John Donkersloot and his grandparents Bruce and Elaine Meeusen ’47 DePree

Dr. Wettack, Dr. Chase, Ki Chang and Aaron Welsch

Lauren Moak and Sarah Havlik

Julian Hinson, Adam Eidson and Jide Banks
Chem Club

The chem club had a wonderful year full of exciting events. Popular social events included a series of summer picnics at Tunnel Park for summer researchers across the Natural and Applied Sciences Division and the annual fall department picnic at Smallenburg Park. We continued several relatively new events, including the popular ‘Paintball Brawl,’ and enjoyed the opportunity to host two Chemistry Club Invited Speakers, Prof. Melanie Sanford from the University of Michigan and Prof. Richard Schrock, 2005 Nobel Laureate in Chemistry, from MIT. The chem club was active in several public service areas. We once again received notoriety for the decoration of our campsite at Relay For Life, we sent a number of representatives to Chemistry at the Mall, where students shared their knowledge of chemistry (and a number of exciting experiments) with shoppers, and we organized several local events in celebration of National Chemistry Week. Our efforts in 2009 were capped off with a Commendable Chapter Award for the Hope College Student Affiliates Chapter of the American Chemical Society, and this award was accepted by a number of our students, including officers Jennifer Bruinius and Valerie Winton, at the spring 2010 ACS Meeting in San Francisco. Officers and returning students alike are looking forward to continuing our chapter’s success and the start of another great year.

### 2008-2009 Officers

- **President**: Andrew Franks
- **Vice-President**: Jacquelyn Lewis
- **Secretary**: Jonathan Moerdyk
- **Treasurer**: Jennifer Bruinius
- **Social Coordinator**: Shirley Bradley
- **Web Master**: Jonathan Moerdyk

### 2009-2010 Officers

- **President**: Jennifer Bruinius
- **Vice-President**: Timothy Shannon
- **Secretary**: Valerie Winton
- **Treasurer**: Clare Hubbard
- **Social Coordinator**: Lydia Baxter & Anna Strong
- **Web Master**: Alex Ketchum
Sitting: Donna Sova, Stephen Taylor, Tod Gugino, Michael Pikaart, Leah Chase, Graham Peaslee, Michael Seymour

Standing row 1: Elizabeth Sanford, Traci Smith, Sameer Chavda, Joanne Stewart, Kenneth Brown, Maria Burnatowska-Hledin

Standing row 2: Sheldon Wettack, William Mungall, Jason Gillmore, Balaji Babu, William Polik, Brent Krueger, Jeff Johnson

On the following pages, each permanent faculty member was asked to comment on their most noteworthy accomplishment(s) of 2009.
Kenneth L. Brown

Associate Professor of Chemistry
At Hope since 1999

Ph.D., Oklahoma State University, 1999
B.S., Oral Roberts University, 1993

This was a very busy year in the laboratory and outside of the laboratory. This year the research lab was full with five students each semester. The students worked on a number of projects in the area of electrochemistry and plant physiology. Two research students were able to restart work on understanding the electrochemistry of carbon–based macroporous electrodes, a growing field in electrochemistry, comparable to the field of carbon nanotubes. The other students worked at the interface of electrochemistry and plant physiology. This was also the first year (a three-year grant) of our NSF-REU grant which targets minority students and students from community colleges. I spent a considerable amount of time coordinating the summer research program for the third consecutive year. In addition, I made trips to Grand Rapids Community College and Oakton Community College to discuss summer research opportunities at Hope College. One manuscript was written and accepted for publication, with a student as a co-author and one outside presentation was made at Gentex Corporation in Zeeland, Michigan.

I had the opportunity to travel to the National Organization of Black Chemists and Chemical Engineers national conference held in Atlanta, Georgia. For this conference, two students, Olajide Banks and Angelica Willis, presented posters at the conference and had networking opportunities with several companies and research institutions. Overall, the trip was a great success. Future trips to the conference are planned with the anticipation that students will present posters or make oral presentations.

Maria Burnatowska-Hledin

Professor of Chemistry
At Hope since 1992

Ph.D., McGill University, 1980
A.B., McGill University, 1975
As always, I am most proud of my research accomplishments with students this year. As in previous years, 14 different students worked in my lab during school year and in the summer. They all worked very hard and had a chance to present their work at several local, regional and national meetings! It was a great learning experience for all of them. Importantly, we had two manuscripts accepted for publication this year. I was very proud to have two Beckman Scholars working in my lab this year and I accompanied Shirley Bradley to the annual meeting at Beckman in California. Some of my work was funded through the Hope College HHMI award to support our collaboration with Dr. Resau at Van Andel Research Institute.

In addition to the work with research students mentioned above, it is noteworthy to point out that I worked very hard this past fall to serve the Biology and Chemistry Departments through teaching. I enjoy teaching my classes and strive to improve my teaching, and consequently, student learning of science.

To keep me busy, I was appointed the chair for the Academic Affairs Board, and later during the year, I was made the director for the new Biochemistry, Molecular Biology major approved this year! Finally, I was very honored to receive the endowed “Frederich Garrett and Helen Floor Dekker Professor of Biomedicine and Chemistry” appointment. In addition, I received the Dean for Natural Sciences Faculty research Award.

Leah A. Chase

Associate Professor of Chemistry
At Hope since 2000

Ph.D., University of Minnesota, 1999
B.S., University of Michigan - Flint, 1993

I am most proud with the outcome of my pursuit to obtain funding for my scholarly efforts during this past year. While I was told in December of 2008 that my NSF-RUI was recommended for funding, the fact that it was officially funded in June of this year was a strong validation of the work I have been doing for the past several years in my lab. I was also thrilled that the Campbell Foundation proposal that I submitted with Chris Barney was also funded. These two projects, while different in focus, are both related to understanding the function of a membrane transporter, System x₀⁻, and its role in protecting cells from oxidative stress.

I also am very pleased with the outcome of my courses over the past year. My students report being challenged and learning a great deal in my classes, and (most of the time 😊) we have a great time learning together. Learning to stay student-focused in my teaching has served me and the students well.
Finally, I am pleased with the national attention the Hope College Neuroscience Minor program is getting through publication of our activities and attendance at the Annual Society for Neuroscience meeting and the Faculty for Undergraduate Neuroscience meetings. I was flattered when Laura Symonds at MSU consulted with me about how we developed our Neuroscience program at Hope College because she has been charged with developing a Neuroscience Program for undergraduates at MSU. (I was shocked they didn’t have one!)

Jason G. Gillmore

Associate Professor of Chemistry
At Hope since 2004

B.S., Virginia Tech, 1996
M.S., Virginia Tech, 1998
Ph.D., University of Rochester, 2003

It was great to return to CHEM 221 (the first semester organic lecture) in Fall 2009, after three years away from the course – I had forgotten how much I love introducing students to their first taste of organic chemistry. It was even better to do so having just submitted a tenure package with which I felt pleased. Likewise with my third and final proposal attempt to the NSF CAREER grant program submitted in July – it is good to know you've given something a lot of hard work and your very best effort, so you can be at peace with the outcome regardless.

Nevertheless, for pride of accomplishment and sheer joy, these pale in comparison to things that are only partly my own accomplishment. The publication of a substantial paper on the synthesis and photochemistry and photophysics of the quinazolinespirohexadienone photochromes is the culmination of many years efforts in the group, spear-headed by the hardest working and most persistent (and arguably the brightest) student I've yet had the privilege of working with – Jon Moerdyk. I could not have accomplished this without his masterful work preparing and studying these compounds and especially learning to do 1D NOEs on a dying NMR instrument (thank God a new one is coming thanks to the department's successful NSF MRI proposal!) to prove structures that corrected another group's errors in previously published reports on these compounds. While it is ultimately just one paper, it encompassed an enormous effort by a large number of very deserving student co-authors, and it was rewarding to see how far we've come in the past four years! Thus it was fitting that the week this
manuscript actually appeared in print, Jon handed me a first draft of a second manuscript, this time on the electrochemistry of these compounds, the very same week he was to be married and move to Austin, TX, where (having turned down offers from Harvard, MIT, and several other top graduate programs) he is pursuing his PhD in the group of Prof Chris Bielawski at the University of Texas. Jon and all my former students, are missed, but I am proud of them as they move on to bigger and better things.

Jeffrey B. Johnson

Assistant Professor of Chemistry
At Hope since 2007

B.A. Gustavus Adolphus College, 2000
Ph.D., University of Wisconsin-Madison, 2004

This has been an exciting and successful year! I believe my most significant accomplishment was the successful composition, submission, and ultimate funding of an NSF-MRI grant for the purchase of a new remotely accessible NMR spectrometer. It was an eye opening experience to put together a large grant of this type—I had never realized the level or organization and detail required to enlist support from collaborating colleagues and institutions! The funds have been used to purchase a new 400 MHz instrument and the simultaneous refurbishing of our current instrument, and we are currently awaiting the arrival of the new instrument.

I am also very excited about the progress within my research program. Over the course of the year 11 students participated for at least one semester in my lab, primarily in the area of transition-metal catalyzed carbon-carbon bond activation. Group members have been extremely productive, presenting 30 times over the course of the year, and we have three individual projects that are nearing completion with two others proceeding nicely. Here’s looking forward to a productive 2010.

Brent P. Krueger

Associate Professor of Chemistry
At Hope since 2001
I think I accomplished quite a bit this year. I’ll try to keep this list to just one thing in each of a few categories:

**Research:** Began new research direction with single-molecule studies of microRNA. I believe this will be a strong new direction for my lab. It has been challenging to begin these experiments prior to gaining funding for the instrumentation, but I think this will be helpful in securing funding if the pending NSF-RUI proposal is not successful.

**High School Teacher Workshop:** After planning for quite a few years, I finally developed and implemented a workshop for high school teachers. The workshop went very well and I think that in addition to being a strong outreach effort, this could have long-lasting positive impact for the department.

**Grant Proposals:** I submitted 10 proposals this year. 4 of these were major proposals, with values of more than $100,000 (NSF-RUI in Jan, NSF-MRI in Jan, NSF-RUI in July, TeraGrid in June). Of the 10 proposals, 2 are still pending and 4 were funded (for a value of approximately $125,000).

**Publications:** Three papers were accepted for publication, this is a strong year for me. The latest of these was accepted in September, but because of the changeover of editors this paper will not actually be published until early 2010.

**Seminar coordinating:** I went to great lengths to increase the visibility of minorities and women in the seminar program, with the result that half of our speakers for the 2009-2010 academic year are from those groups, including our Neckers Lecturer – the most visible speaker of the year.

---

**William S. Mungall**

**Elmer E. Hartgerink Professor of Chemistry**

**At Hope since 1971**

B.A., SUNY at Buffalo, 1967

Ph.D., Northwestern University, 1970

My work with the health professions program was particularly noteworthy. I was able to effectively advise and work with a large number of students. By working with Holland Hospital and other groups, I have developed a number of new opportunities for students interested in internships in the health professions. Our students continue to have a very
high rate of success in gaining admission to medical, dental, and other professional schools.

I was also able to reestablish my research program with one undergraduate student who worked full time last summer and continued working on a voluntary basis during the fall semester. I am also pleased with the way that I was able to reformat the CHEM 221 course in the fall.

Graham F. Peaslee

Professor of Chemistry & Environmental Science and Chairperson, Department of Chemistry
At Hope since 1993
B.A., Princeton University, 1981
Ph.D., SUNY at Stony Brook, 1987

This has been a wonderful year for my research program, which has to be at the top of my accomplishments this year. Considering I am entering my second year as Chair, and we had an important faculty hire as well as a tenure and promotion due this Fall, I was most worried about the administrative load on research productivity. For several reasons it has not been a problem, none the least of which is that the Chemistry Department has a very highly functioning cohort of faculty that does not need a lot of supervision to succeed. I merely stand out of their way most of the time and I am happy to share in their success vicariously. In addition, I am beginning to really learn some of the details needed to make some inroads into the particular area of forensic geochemistry I started two years ago, and it is starting to pay off, both in terms of publications in the pipeline and justification for proposals. Coupled with a wonderful thing called the American Recovery and Reinvestment Act of 2009, which seeded much needed funding into the National Science Foundation and elsewhere this year, I was able to play a role in six proposals written this year, five of which have been funded for a total of over one million dollars and one is still pending. Now I have lots of work to complete over the next few years, and lots of student projects waiting to be done!

I have also been very pleased with the direction the Chemistry Department has been heading with the recent hiring of a new Inorganic Chemist, Beth Anderson, to replace Mike Silver’s position. We have also increased our communication with alumni electronically, and even via print media with the publication of an annual report last year for the first time in many years. We have also begun a very fruitful discussion of curriculum reform in chemistry within the department and I have high hopes for where we will emerge in a year or two as a department. Each of these items seems
inconsequential at times, but looking back at a year’s worth of activity the department is continuing to function well and is continuing to grow stronger at least partly as a result of my efforts as chair – which is a pleasant thought as we start a new year.

---

**Michael J. Pikaart**

**Associate Professor of Chemistry**  
At Hope since 1999

B.S., Calvin College, 1986  
Ph.D., University of Michigan, 1992

Over the past summer I had the opportunity to continue an ongoing research project focused on basic protein/nucleic acid biochemistry as it relates to gene expression, work which received seven years of continuous external funding from the National Institutes of Health. I have published three papers based on this work and find that the key scientific questions motivating my work are answered. At the same time, while basic biochemistry and use of biochemical knowledge to improve human health has and still does form the intellectual basis of my creative motivation, I seek to add a more immediate social value to my work in terms of health impact. Thus, being able to work more actively on the water purification project I’ve been toying with for the past few years has been very exciting. This work provides a meaningful scientific basis, one that is still somewhat lacking, to non-profit groups seeking to bring slow-sand filtration technology to people in need of clean water. Part of the excitement I feel about this work is the groundswell of interest both on campus and off. In terms of Hope College, several tie-ins already exist, including the efforts of engineering and nursing faculty and students to bring improved drinking water to Nkuv, Cameroon, and the Critical Issues Symposium of 2009. Locally, several Christian or humanitarian non-profits are very active in water remediation programs, such as Aquaclara, Living Water, and various church groups, and they value a local network of technical expertise we provide. For myself as a researcher, as I noted above, I find the social aspects of this project to be an exciting aspect of my professional development; one that sets apart the advantage of being in a setting like Hope College as opposed to a large primarily research university, where reaching somewhat beyond one’s narrow academic field is seen in a less positive light. And for the students involved, this project allows the chemistry and engineering students a chance to combine their classroom studies with an immediate application in a way that can be tremendously motivating and represents the ideal of undergraduate education.
Dr. Polik taught General Chemistry Laboratory, Physical Chemistry Lecture, and Physical Chemistry Laboratory during 2009-2010. His curricular improvement efforts included streamlining the General Chemistry Laboratory sequence, converting his Quantum Chemistry lecture notes into online resources, and computerizing data acquisition in the Physical Chemistry Laboratory. He also continues to lead the WebMO project, which is a web-based interface to quantum chemistry programs that has been adopted by over 1,400 educational and research institutions.

After returning from a year of sabbatical leave, Dr. Polik has recruited several talented Hope students to join his research group. They are pursuing a new effort to experimentally characterize potential energy surfaces of highly reactive intermediates by dispersed fluorescence spectroscopy of radical species in a free-jet expansion.

In his service activities, Dr. Polik continues to promote chemistry curriculum reform at the college, national, and international levels. Dr. Polik was given the ACS James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry for chairing the ACS Committee of Professional Training while it developed and released new national guidelines for undergraduate chemistry. At Hope College Dr. Polik is now leading an effort to review and improve the chemistry curriculum in order to better meet student needs and improve student learning while maintaining faculty scholarly activity and using college resources efficiently. His hope is that opportunities presented by the new ACS guidelines will lead to new curricula and pedagogical approaches in the teaching of chemistry which greatly enhance student learning and future scientific productivity.

---

Dr. Elizabeth M. Sanford

Associate Professor of Chemistry
At Hope since 1994

B.A., Smith College, 1987
Ph.D., University of California, Los Angeles, 1992
The accomplishments I am most proud of this year include the successful funding of the NSF REU proposal “Professional Excellence and Development in Science Through Undergraduate Research” that will fund both Hope and external students and concentrate on the inclusion and mentoring of minority and two year college students. Writing and submitting the manuscript “Benzoylation of Ergosterol through Nucleophilic Acyl Substitution and Subsequent Formation of Ergosterol Benzoate Endoperoxide by Reaction with Singlet Oxygen Generated by Photosensitization” with Dr. Mary Roslaniec at Modesto Junior College was also a big accomplishment as it completed a goal of my previous sabbatical. On the teaching front I taught CHEM 103 lecture and lab for the first time in many years to refamiliarize myself with the course and then embarked on a project with Hope Student Ji-Min Jeon and Dr. Mike Short to revamp the CHEM 103 lab and to write a laboratory manual for the course. This project is now in its final stages with new labs and a new lab manual in use for the spring of 2010. I also completed my forth semester of Spanish at Hope and achieve my goal of having basic Spanish language skills.

Michael D. Seymour
Professor of Chemistry
At Hope since 1978

B.A., St. Johns University, 1972
Ph.D., University of Arizona, 1978

Hosting the Midwest Association of Chemistry Teachers in Liberal Arts Colleges (MACTLAC) meeting in October was clearly my most significant activity of the past year. Several key aspects of the planning were carried while I was still on sabbatical leave, with the final details and arrangements taking place upon my return from sabbatical leave in mid-August. The meeting was last held at Hope about 35 years ago when the Peale Science Center was opened, so this meeting was important to showcase the Schaap Science Center, our Department members and the academic and research programs. In the final analysis the program had 100 registered participants from 44 different academic programs and 10 commercial vendors. The three keynote speakers were well received with their presentations on the meeting theme of "Integration of Research into Teaching: Improving Learning Through Research". More details of the program are on the meeting website http://www.hope.edu/resources/mactlac/index.html. The meeting
came together very smoothly due to outstanding help from Donna Sova and the participation of many chemistry colleagues. In conjunction with the MACTLAC meeting I worked closely with CIT to pilot a web based registration program for on-line payment of registration fees. I consider this noteworthy since the success of this pilot project will pave the way for other campus groups to employ this resource for their meetings.

The spring and summer of 2009 saw the continuation of my yearlong sabbatical leave at Gentex Corporation in Zeeland. The opportunity to learn new analytical methods, to spend time reading literature and reference resources, and to critically review and analyze data is highly rewarding. I am certainly feeling professionally renewed and invigorated as I return to the academic program of lectures, laboratories and students.

In addition to teaching general chemistry lecture and laboratory in the fall, I have been working with Jon Peterson to complete a publication on previous research work with Hope students, as well as the submission of a joint HHMI grant to carry out analytical work regarding the presence of pharmaceutical and personal care products in the Macatawa Watershed. This project is important, as this is a growing area of environmental concern and if we can demonstrate the ability to successfully make these measurements it will help validate future research proposals.

Traci L. Smith

Chemistry Instructor of Organic Chemistry Laboratories

B.S., Northern Arizona University, 1995
M.A., University of Texas, 1998

My most noteworthy accomplishment involved my role as coordinator of the organic laboratories. I fully took on the responsibilities as the Director of the of Organic Chemistry Laboratories and served in this role for both the Spring and Fall of 2009. The spring semester went well and I was able to keep organic lab program running in light of the down time of the NMR, which is used heavily during this semester. For the fall semester, I oversaw seven sections of Chem 255 lab in which nearly 140 students were enrolled. The fall was one of the most populated semesters Hope College has ever had in the organic lab program. Even though the labs were somewhat crowded, the students were able to successfully complete their experiments without any major glitches.
I completed my sabbatical year at the University of Queensland (UQ), School of Chemistry and Molecular Biosciences in Brisbane, Australia. The experience far exceeded my expectations in scholarship, travel, family bonding, and tropical climate. I started a new project in "blended learning" with a faculty member at UQ. Blended learning is the combination of electronic learning with more traditional face-to-face activities, and UQ provided a grant to develop a student workshop on molecular structure that brought students into a new, experimental high-tech teaching space at the university. My research collaborator, Gwen Lawrie, and I presented this work at two conferences and we are preparing a publication for the Journal of Chemical Education.

I continued my work with IONiC, an inorganic chemistry 'distributed learning community,' and IONiC's web site (www.ionicviper.org) won an award for its unique combination of digital library and social networking resources. I feel my work with IONiC was my most noteworthy professional activity last year, because we are becoming national leaders in Web 2.0 technology and faculty development. I gave seven professional presentations and workshops on IONiC and was the primary author on two research proposals.

Finally, as part of a multi-institution HHMI project, I helped launch a research project examining interdisciplinary teaching and learning. Starting with virtual meetings while I was still in Australia, we were able to 1) design and implement faculty interviews about interdisciplinary teaching, 2) develop a quantitative survey to pilot this year, 3) develop a process for the multi-institutional qualitative research, and 4) organize a face-to-face meeting for the leadership group, which I attended in Northfield, MN in September. In conclusion, last year was an outstanding year for moving forward several important local, national, and international projects. I look forward to maintaining my collaborations with my new Australian friends as well as developing new collaborators in the growing IONiC community.
Professors and Students

*Top:* Dr. Burnatowska-Hledin, Daniel Salamango, Shirley Bradley and Joe Hobbouche

*Left:* Dr. Seymour and Daryl Andresen

*Top:* Dr. Taylor, Dean Lee and Robert Sjoholm

*Left:* Dr. Polik, Jonathan Parrish and Christopher Jordan
## Grants and Proposals

<table>
<thead>
<tr>
<th>Agency/Source</th>
<th>Title of Proposal</th>
<th>PI; Co-PIs</th>
<th>Amount</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Science Foundation</td>
<td>REU Site: Professional Excellence and Development in Science Through Undergraduate Research</td>
<td>Dr. Brown, Dr. Peaslee, Dr. Sanford</td>
<td>$185,540.</td>
<td>Funded</td>
</tr>
<tr>
<td>HHMI Hope College</td>
<td>Use of VACM-1/cul5 as a Biomarker for Anti-Cancer Drug Resistance.</td>
<td>Dr. Hledin</td>
<td>$12,500.</td>
<td>Active</td>
</tr>
<tr>
<td>Am Heart Assoc</td>
<td>VACM-1/cul5 regulates processing of the preprovasopressin, a precursor for the arginine vasopressin hormone.</td>
<td>Dr. Hledin</td>
<td>Not funded</td>
<td></td>
</tr>
<tr>
<td>Campbell Foundation</td>
<td>Studies of the Mechanism of Regulation of System x_c- by Hydrogen Peroxide</td>
<td>Dr. Chase, Dr. Chris Barney, CoPI</td>
<td>$60,000.</td>
<td>Funded, Ongoing</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>RUI: Constitutive and Regulated Trafficking of the Cystine/Glutamate Exchanger, System x_c-</td>
<td>Dr. Chase</td>
<td>$466,724.</td>
<td>Funded, ongoing</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>CAREER: Photochromic Photooxidants - developing electron deficient photochromes to gate sensitivity toward photoinduced charge transfer</td>
<td>Dr. Gillmore</td>
<td>$549,091.</td>
<td>Funded</td>
</tr>
<tr>
<td>Camille &amp; Henry Dreyfus Foundation (Start-up Award Program)</td>
<td>Perimidinespirocyclohexadienone Photochromic Photooxidants: developing a series of photochromic reactions to allow gating of photoinduced charge transfer initiation of cation radical reactions</td>
<td>Dr. Gillmore</td>
<td>$30,000.</td>
<td>Ongoing (now closed)</td>
</tr>
<tr>
<td>NSF-MRI</td>
<td>NSF-MRI: Acquisition of a Remotely-Accessible 400 MHz Spectrometer</td>
<td>Dr. Johnson, Dean Lee</td>
<td>$430,075.</td>
<td>Funded</td>
</tr>
<tr>
<td>ACS-PRF</td>
<td>The Utilization of Carbon Dioxide in New Applications of Carbon-Carbon Single Bond Activation Methodology</td>
<td>Dr. Johnson</td>
<td>$50,000.</td>
<td>Declined</td>
</tr>
<tr>
<td>Sponsor</td>
<td>Project Description</td>
<td>Principal Investigator</td>
<td>Amount</td>
<td>Status</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>------------------------</td>
<td>------------</td>
<td>--------------</td>
</tr>
<tr>
<td>ACS-PRF</td>
<td>Toward Greater Understanding and Expanded Utility of the Palladium-Catalyzed Activation of Carbon-Carbon Single Bonds</td>
<td>Dr. Johnson</td>
<td>$50,000.</td>
<td>Pending</td>
</tr>
<tr>
<td>Dreyfus Foundation</td>
<td>Development of Carbon-Carbon Bond Activation and Functionalization Methodology</td>
<td>Dr. Johnson</td>
<td>$30,000.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Research Corporation</td>
<td>Carbon-Carbon Single Bond Activation for the Carboacylation of Alkenes</td>
<td>Dr. Johnson</td>
<td>$60,072.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Eli Lilly</td>
<td>Alkene Control of a Diastereoselective Gilman Reaction</td>
<td>Dr. Johnson</td>
<td>$5000.</td>
<td>Funded</td>
</tr>
<tr>
<td>ACS Organic Division</td>
<td>Faculty Travel Award</td>
<td>Dr. Johnson</td>
<td>$600.00.</td>
<td>Funded</td>
</tr>
<tr>
<td>Hope College – Towsley Foundation</td>
<td>Carbon-Carbon Bond Activation: Mechanistic Elucidation and New Methods for Carbon Dioxide Fixation</td>
<td>Dr. Johnson</td>
<td>$16,000.</td>
<td>Funded</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>RUI: Quantifying Fluorescent Probe Dynamics in FRET Experiments</td>
<td>Dr. Krueger</td>
<td>$378,193.</td>
<td>Not funded</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>MRI: Acquisition of a Computer Cluster for Undergraduate Chemistry Research and Teaching by the Midwest Undergraduate Computational Chemistry Consortium (MU3C)</td>
<td>Dr. Krueger; Dr. Kuwata (Macalester), Dr. Polik</td>
<td>$389,780.</td>
<td>Not funded</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>RUI: Quantifying Fluorescent Probe Dynamics in FRET Experiments by Combining Single-Molecule and Bulk Spectroscopies with Molecular Dynamics and Quantum Mechanics Simulations</td>
<td>Dr. Krueger</td>
<td>$445,565.</td>
<td>Pending</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>CCLI: (subaward) Collaborative Research: Development of an Open-Access Dynamic Web-Based Chemistry Education Toolbox</td>
<td>Dr. Krueger Primary award PI Dr. Delmar Larsen (UC Davis)</td>
<td>$20,781.</td>
<td>Not funded</td>
</tr>
<tr>
<td>Organization</td>
<td>Project Description</td>
<td>Principal Investigator(s)</td>
<td>Funding Amount</td>
<td>Status</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Michigan Space Grant Consortium</td>
<td>Development, implementation, and ongoing support for computationally-based investigative course modules in high school classrooms</td>
<td><strong>Dr. Krueger</strong></td>
<td>$4,500</td>
<td>Funded</td>
</tr>
<tr>
<td>Hope College - HHMI Mini Faculty Development Grant</td>
<td>Acquisition of books to assist the transition to single-molecule fluorescence spectroscopy and microRNA</td>
<td><strong>Dr. Krueger</strong></td>
<td>$600</td>
<td>Funded</td>
</tr>
<tr>
<td>Hope College-HHMI Faculty Development Grants for Collaborative Biomedical Research</td>
<td>Understanding the role of structural dynamics in single-molecule FRET experiments</td>
<td>Dr. Krueger; Dr. Nils Walter (U Michigan); Dr. David Rueda (Wayne State)</td>
<td>$12,500</td>
<td>Funded</td>
</tr>
<tr>
<td>Michigan Department of Environmental Quality</td>
<td>Subcontract from: Development of an Alternative Sediment Sampling Method in the Macatawa Watershed, granted to Macatawa Area Coordinating Council</td>
<td><strong>Dr. Peaslee</strong></td>
<td>$11,145</td>
<td>Funded</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>REU SITE: Professional Excellence and Development in Science Through Undergraduate Research</td>
<td>Dr. Brown, Dr. Peaslee, Dr. Sanford</td>
<td>$185,540</td>
<td>Funded</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>MRI-Consortium: Development of a Neutron Detector Array by Undergraduate Research Students for Studies of Exotic Nuclei</td>
<td>Dr. DeYoung, Dr. Peaslee</td>
<td>$203,894</td>
<td>Funded</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>MRI-R2: Acquisition of Instrumentation to Determine Provenance of Environmental Samples</td>
<td>Dr. Peaslee, Dr. Remillard, Dr. Murray</td>
<td>$215,180</td>
<td>Funded</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>RUI: Studies of Unstable Neutron-Rich Nuclei and Interdisciplinary Applications of Nuclear Physics with Undergraduates</td>
<td>Dr. DeYoung, Dr. Peaslee</td>
<td>$295,683</td>
<td>Pending</td>
</tr>
<tr>
<td>Department of Homeland Security</td>
<td>Cathodoluminescent Signatures of Neutron Irradiation</td>
<td><strong>Dr. Peaslee</strong>, Dr. DeYoung</td>
<td>$147,896</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Funding Body</td>
<td>Project Description</td>
<td>PIs/Co-PIs</td>
<td>Amount</td>
<td>Status</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>The Chemistry REU Leadership Group</td>
<td>Dr. Thomas, Dr. Peaslee</td>
<td>$99,163.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>RUI: Fundamental and Applied Nuclear Physics with Undergraduates</td>
<td>Dr. DeYoung, Dr. Peaslee</td>
<td>$311,079.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Specificity and metal inhibition of the interaction between Gata-1 and DNA</td>
<td>Dr. Pikaart</td>
<td>$125,000.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>New Directions Initiative, Great Lakes Colleges Association</td>
<td>The Molecular Channel in Methyl Nitrite – A Collaborative Research Project</td>
<td>Dr. Polik and Dr. Bartz</td>
<td>$33,280.</td>
<td>Declined</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>Cyberinfrastructure and Research Facilities, Collaborative Research: Center for Studying Electronic Structure and Spectroscopy of Open-Shell and Electronically Excited Species</td>
<td>Dr. Polik</td>
<td>$187,000.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>Acquisition of a Computer Cluster for Research, Research Training, and Teaching</td>
<td>Dr. Polik; Drs. Kohen, Krueger, Kuwata, Smith</td>
<td>$379,609.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>Acquisition of a Computer Cluster for Research, Research Training, and Teaching</td>
<td>Dr. Drucker, Drs. Polik, Muyskens, Zwier</td>
<td>$241,663.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>REU Site: Professional Excellence and Development in Science Through Undergraduate Research.</td>
<td>Dr. Brown, Dr. Peaslee, Dr. Sanford</td>
<td>$185,540.</td>
<td>Funded</td>
</tr>
<tr>
<td>Hope Faculty Development Fund (Brookstra Fund)</td>
<td>The Preparation of Highly Conjugated Small Molecules for Device Applications</td>
<td>Dr. Sanford Co-PI Mr. Alex Ketchum</td>
<td>$6,800.</td>
<td>Funded</td>
</tr>
<tr>
<td>HHMI (Hope Internal)</td>
<td>Develop, Test, and Implement Three Biomedically Related Laboratories for CHEM-103 Laboratory</td>
<td>Dr. Short</td>
<td>$2000.</td>
<td>Complete</td>
</tr>
<tr>
<td>Teaching and Learning Curriculum Development Grant: Advanced Concept Teaching Space Development Funds, Un of Queensland</td>
<td>An integrated multisensory workshop to promote curriculum alignment within an introductory chemistry course.</td>
<td>Trevor Appleton (UQ, Aus); <strong>Dr. Stewart</strong>; Tony Wright (UQ, Aus); Gwen Lawrie (UQ, Aus)</td>
<td>$3,765.</td>
<td>Funded</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Dreyfus Special Grant Program in the Chemical Sciences</td>
<td>IONiC: Back to Grad School workshop</td>
<td><strong>Dr. Stewart</strong>; Barbara Reisner (James Madison University)</td>
<td>$35,000.</td>
<td>Declined</td>
</tr>
<tr>
<td>GLCA New Directions</td>
<td>Come for the content, stay for the community: Building a vibrant community of practice among GLCA chemists</td>
<td><strong>Dr. Stewart</strong>; Hilary Eppley (DePauw); Lori Watson (Earlham)</td>
<td>$15,700.</td>
<td>Pending</td>
</tr>
<tr>
<td>Howard Hughes Medical Institute</td>
<td>Reaching beyond the borders of Hope: Advancing biomedical research and science education at Hope College</td>
<td><strong>Dr. Stewart</strong></td>
<td>$1,400,000</td>
<td>Ongoing</td>
</tr>
<tr>
<td>National Science Foundation - Course, Curriculum, and Laboratory Improvement</td>
<td>A cyber-enabled community of practice for improving inorganic chemical education</td>
<td>Dr. Eppley (DePauw), Dr. Geselbracht (Reed), Dr. Benatan (Reed), Dr. Johnson (Harvey Mudd), Dr. Reisner (JMU),</td>
<td>$149,374.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Authors</td>
<td>Title</td>
<td>Journal</td>
<td>Vol; Page</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>---------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>Anne Short*, Rachel Vankempen*, Michael Seymour, <strong>Burnatowska-Hledin, M.A.</strong>, Seymour, M.D., Short, Michael</td>
<td>Using HPLC-Mass Spectrometry to Teach Proteomics Concepts with Problem-based Techniques</td>
<td><em>Biochemistry and Molecular Biology Education</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shirley E. Bradley*, Alyssa E. Johnson*, Isabelle P. Le, Elizabeth Oosterhouse, Michael P. Hledin, Gabriel A. Marquez, and <strong>Burnatowska-Hledin, M.A.</strong></td>
<td>Phosphorylation of VACM-/CUL5 by Protein Kinase A Regulates its Neddylation and Antiproliferative Effect</td>
<td><em>Journal Biol Chem</em></td>
<td>285 0n line</td>
<td></td>
</tr>
<tr>
<td>Chase, L.A., Barney, Christopher B.</td>
<td>Developing a Project-Oriented Introduction to Neuroscience Lab at Hope College</td>
<td><em>Journal of Undergraduate Neuroscience Education</em></td>
<td>8(1); A37-A43</td>
<td></td>
</tr>
<tr>
<td>Name(s)</td>
<td>Title</td>
<td>Journal/Book</td>
<td>Page/Volume</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>--------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>Moerdyk, J.P.<em>; Speelman, A.L.</em>; Gillmore, J.G.</td>
<td>Experimental and computational electrochemistry of quinazolinespirohexadienones – differential electrochromic vs. photochromic behavior.</td>
<td><strong>undecided</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stanford, D.J.; Higgins, T.B.; Gillmore, J.G.; Johnson, J.B (with additional student &amp; faculty co-authors under consideration).</td>
<td>Undergraduate research facilitated transitions from 2YC to 4YC</td>
<td><em>Journal of Chemical Education</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Johnson, J. B.; Cook, M. J.; Rovis, T.</td>
<td>Ligand differentiated complementary Rh-catalyst systems for the enantioselective desymmetrization of <em>meso</em>-cyclic anhydrides</td>
<td><em>Tetrahedron</em> 65; 3202</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Johnson, J. B.</td>
<td>Ring Opening of Epoxides, Aziridines and Cyclic Anhydrides. For <em>Science of Synthesis, Vol 3; Stereoselective Pericyclic Reactions, Cross Coupling, C-H and C-X Activation, P. A. Evans, ed.</em></td>
<td><em>Book Chapter</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Munoz-Losa, A.; Curutchet, C.; Krueger, B.P.; Hartsell, L.R.*; Mennucci, B.</td>
<td>Fretting about FRET: Failure of the Ideal Dipole Approximation</td>
<td><em>Biophys. J.</em> 96, 4779–4788</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Title</td>
<td>Journal</td>
<td>Volume</td>
<td>Pages</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>---------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>Aguilera, E.F., Martinez-Quiroz, E., Rosales, P., Kolata, J.J., DeYoung, P.A., Peaslee, G.F., Mears, P.<em>, Guess C.</em>, Becchetti, F.D., Lupton, J.H., Chen, Y</td>
<td>Hindrance of complete fusion in the $^8$Li+$^{208}$Pb system at above-barrier energies</td>
<td>Physical Rev. C</td>
<td>80</td>
<td>044605</td>
</tr>
<tr>
<td>Sanford, E.M., Lis, C.C.<em>; McPherson, N.</em></td>
<td>The Preparation of Allyl Phenyl Ether and 2-Allylphenol Using the Williamson Ether Synthesis and Claisen Rearrangement</td>
<td>Journal of Chemical Education</td>
<td>86(12);</td>
<td>1422</td>
</tr>
<tr>
<td>Roslaniec, M.C, Sanford, E.M.</td>
<td>Benzylation of Ergosterol through Nucleophilic Acyl Substitution and Subsequent Formation of Ergosterol Benzoate Endoperoxide by Reaction with Singlet Oxygen Generated by Photosensitization.</td>
<td>Journal of Chemical Education</td>
<td>Submitted, reviewed</td>
<td>#2009-0402</td>
</tr>
<tr>
<td>Peterson J.W., O’Meara TA*, Seymour, M.D., Wei W, Gu B</td>
<td>Sorption Mechanisms of Cephapirin, a Veterinary Antibiotic, onto Quartz and Feldspar Minerals as Detected by Raman Spectroscopy</td>
<td>Environmenta l Pollution</td>
<td>157(6);</td>
<td>1849-1856</td>
</tr>
<tr>
<td>Presenter/Author</td>
<td>Title of Presentation</td>
<td>Title of Meeting or Program</td>
<td>Location</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------</td>
<td>-----------------------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>K.L. Brown</td>
<td>Professional Excellence and Development Through Transformative Undergraduate Research Experiences</td>
<td>REU PI Leadership Workshop</td>
<td>San Antonio, TX</td>
<td></td>
</tr>
<tr>
<td>K.L. Brown</td>
<td>Chemistry and Biochemistry Research at Hope College</td>
<td>Seminar Program</td>
<td>Grand Rapids Community College</td>
<td></td>
</tr>
<tr>
<td>K.L. Brown</td>
<td>Chemistry and Biochemistry Research at Hope College</td>
<td>URC Symposium</td>
<td>Oakton Community College</td>
<td></td>
</tr>
<tr>
<td>M.B.-Hledin, S. Bradley</td>
<td>Regulation of VACM-1 function by posttranslational modifications</td>
<td>Am. Soc. Biochem. Molec Bio</td>
<td>New Orleans</td>
<td></td>
</tr>
<tr>
<td>L.A. Chase</td>
<td>The Rapid Trafficking of System x̅:\textsuperscript{-} Plays an Important Role in the Antioxidant Defense Mechanisms of Glial Cells</td>
<td>Invited Talk, Calvin College</td>
<td>Grand Rapids, MI</td>
<td></td>
</tr>
</tbody>
</table>

**Presentations**

(Faculty seminars, abstracts, posters and talks, * indicates undergraduate collaborator)
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>L.A. Chase, A. Goltz, T. Henderson, S. Sherburn</td>
<td><em>Cell Surface Expression of System x− is Affected by Cell Culture Density</em></td>
<td>Annual Society for Neuroscience Meeting</td>
<td>Chicago, IL</td>
</tr>
<tr>
<td>C.B. Barney, L.A. Chase, G.F. Fraley</td>
<td><em>A project based introduction to neuroscience laboratory course as a model for experiential learning in science</em></td>
<td>Experimental Biology</td>
<td>New Orleans, LA</td>
</tr>
<tr>
<td>J.G. Gillmore</td>
<td><em>Synthesis, Photochemistry, and Electrochemistry of Quinoline Analogs of Perimidine Spirohexadienone Photochromes.</em></td>
<td>Inter-American Photochemical Society 19th Winter Meeting (contributed poster)</td>
<td>St. Petersburg Beach, FL</td>
</tr>
<tr>
<td>J.G. Gillmore</td>
<td><em>Photochemistry, Electrochemistry, and Computation, Oh My... an organic chemist looks at old photochromes in a new way.</em></td>
<td>Gustavus-Adolphus Chemistry Department seminar (invited talk)</td>
<td>St. Peter, MN</td>
</tr>
<tr>
<td>J.G. Gillmore</td>
<td><em>Synthesis, Photochemistry, Electrochemistry, and Computation: First Forays Toward Photochromic Photooxidants.</em></td>
<td>Bowling Green State University Chemistry Department &amp; Center for Photochemical Sciences seminar (invited talk)</td>
<td>Bowling Green, OH</td>
</tr>
<tr>
<td>J.G. Gillmore</td>
<td><em>Synthesis, Photochemistry, Electrochemistry, and Computation: First Forays Toward Photochromic Photooxidants.</em></td>
<td>Johns Hopkins University Chemistry Department seminar (invited talk)</td>
<td>Baltimore, MD</td>
</tr>
<tr>
<td>J.G. Gillmore</td>
<td><em>Faculty Careers at Undergraduate Institutions: Teaching, Research and Service.</em></td>
<td>Johns Hopkins University Chemistry Department graduate &amp; postdoctoral student seminar/discussion (invited talk)</td>
<td>Baltimore, MD</td>
</tr>
<tr>
<td>J.B. Johnson</td>
<td><em>Carbon-Carbon Bond Activation: Does that Really Work?</em></td>
<td>Calvin College, Chemistry Seminar</td>
<td>Grand Rapids, MI</td>
</tr>
<tr>
<td>Name</td>
<td>Title</td>
<td>Organization</td>
<td>Location</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------------------------------------</td>
<td>----------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>J.B. Johnson</td>
<td>Carbon-Carbon Bond Activation</td>
<td>NAS Divisional Meeting</td>
<td>Hope College</td>
</tr>
<tr>
<td>B.P. Krueger</td>
<td>Invited talk: Fretting about FRET: Breakdown of the Ideal Dipole Approximation</td>
<td>American Chemical Society National Meeting</td>
<td>Salt Lake City, UT</td>
</tr>
<tr>
<td>G.F. Peaslee, and P.A. DeYoung</td>
<td>Topical Nuclear Science Research at an Undergraduate Institution</td>
<td>American Assn of Physics Teachers Annual Meeting</td>
<td>Chicago, IL</td>
</tr>
<tr>
<td>G.F. Peaslee</td>
<td>Applications of Ion Beam Analysis in Forensic and Environmental Geochemistry</td>
<td>Invited Seminar – Appalachian State University Chemistry Department</td>
<td>Boone, NC</td>
</tr>
<tr>
<td>G.F. Peaslee and P.A. DeYoung</td>
<td>An Undergraduate Ion Beam Analysis Laboratory</td>
<td>International Atomic Energy Agency Conference on Applications and Utilization of Accelerators.</td>
<td>Vienna, Austria</td>
</tr>
<tr>
<td>G.F. Peaslee</td>
<td>Cathodoluminescent Signatures of Neutron Irradiation</td>
<td>Invited Seminar – Counterrorism &amp; Forensic Science Research Unit, FBI</td>
<td>Quantico, VA</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>Promoting Excellence: The New American Chemical Society Guidelines for Undergraduate Chemistry Education</td>
<td>University of Queensland</td>
<td>Brisbane, Australia</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>Measuring, Modeling, and Computing Resonances in Excited Vibrational States of Polyatomic Molecules</td>
<td>University of Queensland</td>
<td>Brisbane, Australia</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>Measuring, Modeling, and Computing Resonances in Excited Vibrational States of Polyatomic Molecules</td>
<td>University of Otago</td>
<td>Dunedin, New Zealand</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>Promoting Excellence: The New American Chemical Society Guidelines for Undergraduate Chemistry Education</td>
<td>University of Otago</td>
<td>Dunedin, New Zealand</td>
</tr>
<tr>
<td>Name</td>
<td>Title</td>
<td>Institution</td>
<td>Location</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>Calculation of Thermal $H+O_2 \leftrightarrow HO_2$ Rate Constants</td>
<td>Australia Institute for Bioengineering and Nanotechnology</td>
<td>Brisbane, Australia</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>Promoting Excellence: The New American Chemical Society Guidelines for Undergraduate Chemistry Education</td>
<td>University of Sydney</td>
<td>Sydney, Australia</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>Measuring, Modeling, and Computing Resonances in Excited Vibrational States of Polyatomic Molecules</td>
<td>University of Sydney</td>
<td>Sydney, Australia</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>Measuring, Modeling, and Computing Resonances in Excited Vibrational States of Polyatomic Molecules</td>
<td>Australian National University</td>
<td>Canberra, Australia</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>WebMO: Web-based, state-of-the-art and cost-effective Computational Chemistry</td>
<td>Fall 2009 National ACS Meeting</td>
<td>Washington, DC</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>New ACS Guidelines: Developing Excellence Through Degree Tracks</td>
<td>Midwestern Association of Chemistry Teachers at Liberal Arts Colleges</td>
<td>Holland, MI</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>New ACS Guidelines: Innovation Through One-Semester Foundation Courses</td>
<td>Midwestern Association of Chemistry Teachers at Liberal Arts Colleges</td>
<td>Holland, MI</td>
</tr>
<tr>
<td>W.F. Polik</td>
<td>The New ACS Guidelines: A Stimulus Package for Educating Chemistry Students in the 21st Century</td>
<td>Northeastern Section of the American Chemical Society</td>
<td>Boston, MA</td>
</tr>
<tr>
<td>M.D. Seymour</td>
<td>Epoxy Analysis using Pyrolysis GC-MS</td>
<td>Gentex Research and Development</td>
<td>Zeeland, MI</td>
</tr>
<tr>
<td>M.D. Seymour</td>
<td>Electrochromic mirrors and chemical analysis</td>
<td>Hope College Seminar Program</td>
<td>Hope College</td>
</tr>
<tr>
<td>J. W. Peterson, Daryl Andresen, M.D. Seymour, Wei Wang and Baohua Gu</td>
<td>Raman Spectroscopic Investigation of Cephalosporin Antibiotic Sorption onto SiO$_2$, Al$_2$O$_3$, and Plagioclase Feldspar (Poster 251-18 presented by Jon Peterson)</td>
<td>2009 Geological Society of America Annual Meeting</td>
<td>Portland, OR</td>
</tr>
<tr>
<td>Name</td>
<td>Title</td>
<td>Event</td>
<td>Location</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>M.D. Seymour, J.W. Peterson</td>
<td><em>A Conversation on Pharmaceutical Contamination of Natural Waters</em></td>
<td>Meeting of the West Michigan Water Works Board</td>
<td>Hope College</td>
</tr>
<tr>
<td>J.L. Stewart</td>
<td><em>Come for the content, stay for the community: Virtual networks for improving chemistry teaching</em></td>
<td>Chemistry Seminar, University of Queensland</td>
<td>Brisbane, Australia</td>
</tr>
<tr>
<td>J.L. Stewart</td>
<td><em>Come for the content, stay for the community: Virtual networks for improving chemistry teaching</em></td>
<td>Chemistry Seminar, Queensland University of Technology</td>
<td>Brisbane, Australia</td>
</tr>
<tr>
<td>G. Lawrie, J.L. Stewart</td>
<td><em>Using multiple representations to enhance understanding of molecular structure: A blended learning activity in the ACTS room</em></td>
<td>Blended Learning Conference</td>
<td>Brisbane, Australia</td>
</tr>
<tr>
<td>J.L. Stewart</td>
<td><em>Faculty development, collaborative inquiry, and Web 2.0</em></td>
<td>National American Chemical Society Meeting</td>
<td>Washington, DC</td>
</tr>
<tr>
<td>J.L. Stewart</td>
<td>Motivation...Organization...Reflection...Elaboration: Active learning strategies for the college classroom</td>
<td>Teaching Enhancement Workshop</td>
<td>Hope College</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>J.L. Stewart, G. Lawrie, L. Wright, T. Appleton</td>
<td>Using multiple representations to enhance the construction of conceptual models of molecular structure: a blended learning activity.</td>
<td>National Uniserve Science Conference</td>
<td>The University of Sydney, Australia</td>
</tr>
<tr>
<td>J.L. Stewart, B.S. Williams, L. Watson, B. Reisner</td>
<td>The Virtual Inorganic Pedagogical Electronic Resource (presentation and short workshop)</td>
<td>Midwest Association of Chemistry Teachers at Liberal Arts Colleges</td>
<td>Hope College</td>
</tr>
<tr>
<td>J.L. Stewart</td>
<td>Come for the content, stay for the community: Virtual networks for improving chemistry teaching (poster)</td>
<td>International Society for the Scholarship of Teaching and Learning 2009</td>
<td>University of Indiana, Bloomington, IN</td>
</tr>
<tr>
<td>J.L. Stewart, G. Lawrie</td>
<td>Using multiple representations to enhance the understanding of molecular structure: a blended learning activity</td>
<td>International Society for the Scholarship of Teaching and Learning 2009</td>
<td>University of Indiana, Bloomington, IN</td>
</tr>
<tr>
<td>J.L. Stewart, T. Ferrett</td>
<td>Connected Science: Strategies for Integrative Learning in College</td>
<td>International Society for the Scholarship of Teaching and Learning 2009</td>
<td>University of Indiana, Bloomington, IN</td>
</tr>
</tbody>
</table>
Annual Spring Dessert 2009
The chemistry seminar program and the Symposium on Synthetic Organic Chemistry brought in many visiting scientists from academic institutions and area industrial chemists. Students can meet the speakers over lunch to discuss graduate school, careers, and research problems, or other related topics. Students can meet the speakers over lunch to discuss graduate school, careers, and research problems, or other related topics. Professor Brent Krueger organized the seminar program for 2008-09. Students can meet the speakers over lunch to discuss graduate school, careers, and research problems, or other related topics.
January 9

**Hope Chemistry Student Research Showcase**

**Julian Hinson**  “Progressing from Knowledge to Understanding, Researching Thin-film Electrode Dynamics through Rutherford Backscattering”

**Jeanne Oxendine**  “Anti-Cancer Properties of a Novel Peptide that Regulates VACM-1/Cul5 Signaling”

**Valerie Winton**  “Organometallic Catalysis: Manipulating Carbon-Carbon Single Bonds”

January 16

**Professor Martin D. Burke (MD/PhD) & Professor M. Christina White,** University of Illinois at Urbana-Champaign

“Synthesis-enabled studies of the amphotericin B ion channel” (Burke)

“C-H: A New Functional Group for Streamlining Synthesis” (White)

January 23

**Professor Jenny Hampton,** Hope College Physics Department

“Characterization of Electrodeposited Magnetic Thin Films”

January 30

**Professor Brandy S. Russell,** Gustavus Adolphus College

“Folding, Metal Site Assembly, and Metal Binding Specificity in Metalloproteins”

February 13

**Professor Dave Benson,** Calvin College

“Using Nanotechnology to Measure Molecule Concentrations in Living Cells”

February 20

**Professor Nancy E. Levinger,** Colorado State University

“How Does Confinement Impact the Properties of Water?”

February 27

**Professor Paul A. Deck (Hope ’87),** Virginia Tech

“Synthesis of Fluoropolymers Using the Diels-Alder Reaction”

March 6

**ChemClub Student-Invited Speaker**

**Professor John P. Toscano,** Johns Hopkins University

“Design and Study of New Nitroxyl (HNO) Precursors and Their Potential in the Treatment of Heart Failure”

March 27

**Celebration of Undergraduate Research & Creative Performance**

DeVos Fieldhouse 2:30 – 4:30pm

April 2

**Public Lecture – Professor Harry B. Gray,** Caltech

“Powering the Planet with Solar Fuel”

cosponsored by Chemistry, Geological & Environmental Sciences, Environmental Issues, Environmental Studies & the Hope College Sustainability Task Force

April 3

**Neckers Lecture – Professor Harry B. Gray,** Caltech

“Electron Flow Through Iron and Copper Proteins”

April 17

**Professor Suk-Wah Tam-Chang,** University of Nevada at Reno

“From Supramolecular Assemblies to Functional Materials and Fluorescent Probes”
Hope College Chemistry Department Seminar Schedule

Fall Semester 2009
A. Paul Schaap Science Center 1000, Friday, 4:00PM
(unless otherwise noted)

September 4

Dr. Michael D. Seymour, Hope College
Electrochromic Mirrors and Chemical Analysis

Dr. William F. Polik, Hope College
An International Collaboration to Model HO₂ Dissociation and Recombination Kinetics

Dr. Joanne L. Stewart, Hope College
Chemistry Adventures in Oz: "Blended Learning" and Blended Cultures

September 11

Dr. Christine S. Chow, Wayne State University
Modified Regions of Bacterial Ribosomes as Drug Target Sites

September 18

Dr. Kathryn L. Davis, Hope '05, University of Pittsburgh
Charge Transfer Properties of Immobilized Biomolecules: Small Steps Toward New Molecular Devices

September 25

Joint Seminar with Biology

Graves 112

Dr. Gerald Hazelbauer, University of Missouri
Bacterial Chemotaxis, a Paradigm for Studying Biological Signaling Mechanisms at the Molecular Level

October 2

No seminar

October 9

DeWitt Theatre
3:30pm

Natural & Applied Sciences Division Gentile Interdisciplinary Lecture

Dr. A. Paul Schaap, Hope ’67, Wayne State University
Chemiluminescence and 1,2-Dioxetanes: From Fireflies to the Detection of DNA

October 23

Dr. Susan B. Rempe, Sandia National Lab
Ion Discrimination by Nanoscale Design

October 30

Inorganic Candidates TBA

November 3

November 6

November 13

Dr. James McCusker, Michigan State University
The Science of Solar Energy Conversion: An Inorganic Photochemist in ExxonMobil’s Court

November 20

Dr. John Montgomery, University of Michigan
Discovery and Application of Nickel-Catalyzed Coupling Processes

December 4

Dr. Stephen K. Taylor, Hope College
What My Students Have Done
The James and Jeanette Neckers Lectureship in Chemistry with Dr. Harry Gray

“Electron Flow Through Iron and Copper Proteins”

Dr. Douglas Neckers with Dr. Gray

Dr. Graham Peaslee with Dr. Gray

Shirley Bradley, Jacquelyn Lewis and Joseph Stodola with Dr. Gray
Discretionary Funds Administered by the Department

The following endowed funds are used by the Department to support undergraduate research. Approximately $50,444 was available in 2009, and was expended on approximately 15 student stipends for summer research.

The Chemistry Undergraduate Research Fund, an endowed fund established in 1984 to promote undergraduate research in all fields of chemistry. Alumni, faculty and friends of the College donate to this fund on an annual basis.

The Cupery Student Research Fellowship, established in memory of Susanna (Ouweneel) Cupery by the late Dr. Martin ('24) Cupery of Friesland, WI, provides a stipend for a summer research student in chemistry.

The Dr. Bernard J. DeWitt Chemistry Fund, established by his wife, Pauline J. DeWitt, and children Deborah DeWitt and David DeWitt, in memory of the late Bernard J. DeWitt, B.S., Hope College, 1937; Carnegie Mellon, 1940. The fund provides a stipend for a summer research student in chemistry.

The John and Ruth DeVries Chemistry Fund, established by Dr. And Mrs. John De Vries of Palo Alto, CA, provides a stipend for a summer research student in chemistry.

The J. and J. Neckers Chemistry Lectureship and Student Assistance Fund established by the late Dr. James W. Neckers and the late Jeannette Hoffman Neckers of Carbondale, IL and Holland, MI provides support to bring outstanding chemists to the Hope campus to present lectures on recent advances in chemistry and to assist the payment of summer research stipends.

The Smallegan Undergraduate Research Fund is a fund to support the summer research with preference given to a female student. The fund is given to the glory of God in memory of Dick Edward ('15) and Anna Klooster Smallegan, by their children, Marian Smallegan ('45), and John ('51) and Evelyn ('51) Smallegan.

The Donald W. Visser Memorial Fund, established by the California Foundation for Biochemical Research in memory of Donald W. Visser, 1937 Hope Graduate and long time member of the Faculty at the University of Southern California Medial School, provides a stipend and supplies for a summer research student in biochemistry/chemistry.

The James H. and Marian Klaassen Zwemer Chemistry Fund, established by the late James and Marian Zwemer, provides support for equipment and student/faculty research.

Thomas L. Riechel Endowed Fund for Summer Research In Chemistry, a fund to provide financial assistance to deserving Hope College students engaged in summer research in the College’s Department of Chemistry. Established by Dr.Thomas L. Riechel in
appreciation of his daughter Rebecca’s undergraduate experience at Hope, and in honor of his career in teaching and research as an analytical chemist at Miami University, Oxford, Ohio.

*The Roger Mulder ('61) and Beverly Mulder Chemistry Endowment:* Established in 2007 by Roger and Beverly Mulder to provide support for the travel expenses of chemistry majors when attending meetings where they will present the results of their research. This fund will enhance the undergraduate research experience by providing opportunities for students to interact with a broad range of professionals in the discipline. The Chairperson of the Chemistry Department will administer the travel awards.

The following endowed scholarship funds are not administered by the Department, but are intended to impact the Department through support of Chemistry majors. The Financial Aid office is responsible for the assignment of these scholarship funds.

*The William H. '62 and Mary E. Roters '63 Holleman Scholarship Fund.* A fund established in 1996 to provide financial assistance to deserving students with financial need. Scholarships are awarded to juniors and seniors demonstrating a commitment to graduate school in the biological or chemical sciences, with preference given to Biochemistry. Established by William H. Holleman through the estate of his parents, Hilbert and Norma Holleman. In addition, the fund has been added to by William H. Holleman (Chemistry major) and his wife Mary “Betty” Holleman (Biology major).

The *Jaecker Chemistry Scholarship Fund* established by Harry and Mildred Jaecker, assists worthy students who wish to study chemistry at Hope College.

The *Pschigoda Chemistry Scholarship Fund*, established by Miss Loraine Pschigoda ('59) of Portage, MI., to benefit female students from the Great Lakes region who are pursuing majors in chemistry.

The *Rozema Scholarship Fund*, established in memory of Charles ('29) and Marie Rozema to assist needy chemistry students. Dr. and Mrs. David Brower ('63) and Mary (Brower) Post ('48) were instrumental in arranging this scholarship.

*Dr. Gerrit Van Zyl ‘18 Chemistry Scholarship Fund* – a fund established by the Burton G. Bettingen Corporation of Beverly Hills, California to honor Dr. Gerrit Van Zyl, professor of Chemistry, 1923-64. Scholarships will be awarded annually to outstanding chemistry students with financial need with preference given to students engaged in independent research with faculty members. This scholarship honors the life and career of Dr. Van Zyl who was instrumental in building Hope’s national reputation of excellence in the natural sciences.
Alumni Updates

In the previous incarnation of this annual report, we wrote letters to alumni that were 5 and 10 years beyond graduation and published the responses in the back of the booklet. Although only a fraction (about a third) responded to the mailing, the news they shared was always fun to read and it encouraged alumni to keep in touch with each other and with the department. This led to the creation of a website that was linked to our departmental homepage that simply posted this information for each class, so that it wasn’t just for the 5-year and 10-year alumni. We had several hundred responses to that website over the years, and 99% of it was very positive. Still, it took effort to maintain it regularly (our only real complaint about the site was that it was out of date most of the time), and it only represented a small segment of the alumni…the Chemistry majors. Fast forward a decade, and Hope College has realized how valuable it is to connect electronically with its entire alumni pool and they have developed a much more sophisticated website that is password protected and offered to all alumni. Yet, within this new MyHope site there are options to search by discipline, and link to existing social networking sites, and to add information directly. Last year we made the decision to migrate our alumni webpages to this new MyHope site run by alumni relations. It saves us valuable maintenance time, and it already contains information from more chemistry majors than our old site did. It tends to be more heavily populated by the younger graduating classes so far, but that is changing as more alumni are made aware of the opportunity. Thus, we are encouraging you to visit the http://myhope.hope.edu website and sign up for it (if you haven’t already) as it is completely free to alumni. There are some instructions from alumni relations on the following page, and if you are not able to access all the alumni news you seek through that site, don’t hesitate to send us a message and we’ll try to facilitate your search. To this end, we have also recently created a Facebook site entitled “Hope Chemistry Alumni”, which will be available to all who wish to sign up. For those of you who already spend way too much time social networking, please feel proud to add the Chemistry Alumni site to your list!

Finally, please do not forget to come visit the Chemistry Department whenever you are in the West Michigan area! We are always eager to meet with our alumni, either formally or just with a hallway visit for a few minutes. Typically we can give you a tour of the new facilities, arrange a meeting with any particular professor or two, and update you on the status of the department at any time. It helps to have warning a day or two in advance, but it is not necessary…come visit Donna Sova in room 3103 of the Schaap Science Center and she will set it up. If you have the time, we often have current undergraduate chemistry majors that are filled with questions about their particular future, and they would often love to have a cup of coffee with an alumnus/alumna that might be able to offer insight. We have also formed a student advisory panel of alumni and chemistry professionals that meets with students formally once or twice a year for professional development advice, and if you are interesting in contributing in this way please don’t hesitate to contact us: chemistry@hope.edu

Best wishes for a wonderful year and watch for another bulletin next summer.
www.hope.edu/alumni
An online resource and community for Hope alumni

When not logged in...

- Alumni Association Info
- General myHope Info
- Campus Info
- News & Events
- Event Registration
- Social Networking Links
- Giving to Hope
- News From Hope
- Alumni Profiles
- Award Nominations
- Alumni Services & Clubs
- Alumni Data Request

How?
Simply visit
www.hope.edu/alumni
Or click the alumni link at www.hope.edu

When logged in...

- My Profile
- Alumni Directory
- Career Center
- Class Notes
- Friends Lists
- Message Boards
- Event & Member Photos
- Downloads
- Blogs
- Classifieds
- Groups
- Facebook Connect

How?
Click log in or get started in the orange myHope box
Email alumni@hope.edu for help

Alumni Directory
After you log in, navigate to the directory under the “connections” category in the main navigation. You can then click “advanced search” to find classmates by graduation year, major, activities and current location.

Hope College Office of Alumni and Parent Relations
616-395-7250 | alumni@hope.edu | www.hope.edu/alumni
Tod Gugino, Director of Laboratories since 1986.

As usual, Tod is keeping the entire department running smoothly, supplying both the teaching and research labs, running close to 75 Teaching Assistants during the year — in addition to supervising the very successful Summer Science Camps series for Hope College.

Donna Sova, Office Manager since 2007.

In only her third year, Donna has assumed control of the department—she is largely responsible for this report, and dozens of others that need to get done in addition to the day to day operation of the department. Most importantly, Donna is the face of the department most visitors see first, and she does a magnificent job interfacing with students, faculty and the public.