GRAND VALLEY STATE UNIVERSITY
DEPARTMENT OF CHEMISTRY

Chemistry Department Newsletter

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SOME FEATURES IN IN THIS ISSUE:

Editor:
Felix Ngassa

Layout:
Jennifer Glaab

Chemistry Department
312 Padnos Hall
www.gvsu.edu/chem
chmdept@gvsu.edu

A Word from the Incoming Chair

I am honored, and a little apprehensive, that my colleagues have asked me to serve as Chair of the department. My initial year as Chair will be my thirteenth on the GVSU faculty. During the first twelve, Harvey Nikkel and Todd Carlson very ably led the department. I offer my heartfelt thanks to them, and hope that my own best efforts are sufficient for the job.

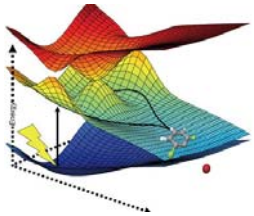
In some ways, the task is easy. Colleagues across campus have told me that they regard Chemistry as "a happy department" and "a well-functioning department". Viewing from the inside, I agree! We are a large department, with diverse interests and needs, but our faculty are focused on how we can best serve our students and therefore generally united in their goals. They work together respectfully when different opinions exist about how to reach those goals. One of my tasks as Chair is preserving, and strengthening, this supportive and effective culture.

Our main challenge, as it has been for years, is balancing the size and composition of our faculty with the needs of our students. Most of our thousands of students are not chemistry majors, but they deserve excellent instruction in courses ranging from Chemistry and Society to advanced courses in biochemistry. Our chemistry majors need not only excellent classroom and laboratory instruction but also opportunities for independent study and original research. It is impractical for us to maintain a regular faculty large enough to provide all this instruction, and we do not have graduate students teaching lab sections as many departments with similar student numbers do. The department completes its tasks with help from a group of dedicated affiliate, visiting, and adjunct faculty members, and a small but highly professional group of support staff. Keeping an appropriate mix, and helping all these classes of faculty grow in their skills and capabilities, is both challenging and crucial.

Research projects play a key role in our offerings to chemistry majors and other students with deep interests in chemistry. At the undergraduate level, research is nearly the only place where a student can meaningfully address questions whose answers are not known. That sort of effort is qualitatively different from even the most challenging textbook question or course project. Most of the regular faculty supervise research students each year, and in the past three years the students and faculty have published roughly 40 journal articles and book chapters and made dozens of presentations at conferences. I hope to help this activity grow and improve. In my view, we could benefit from a more generous flow of ideas into and out of the department through seminars, conferences, and collaborations, and I hope we can find ways to increase that flow.

Alumni who come back to visit are accustomed to a set of questions from me: "Did you feel that you knew the things you were expected to know in your first job? Was your background good enough that you could study and learn the new material that hadn't been part of your GVSU experience? How did your preparation compare to the other graduate students in your entering class? Were there things you wished we had taught you but we hadn't?" I'd like to extend those questions to those of you who haven't been peppered with them in person. Many of you are GVSU chemistry alumni. You are among the best feedback sources we have, because you know firsthand how well your GVSU education has served your needs. If you'll let us know, it will help us serve the needs of our current students better, and that's our goal. Please keep in touch!

George McBane



Arnold C. Ott Lectureship in Chemistry for 2012-2013 School Year

A tradition that started with one lectureship a year has now extended to two lectureships, one in the fall semester and the other in the winter semester. The Ott Lectureship remains a Grand Valley Chemistry Department tradition that honors the legacy of Dr. Arnold Ott, who was one of the co-founders of Grand Valley and served on the Board of Trustees for 28 years. The Ott Lectureship was created and endowed by a gift from Arnold C. Ott and Marion Ott. Our Ott Lecturers, for the 2012-2013 school year, were Drs. Kevan Shokat, and Ada Yonath.

Dr. Kevan Shokat

Dr. Kevan Shokat received his Ph.D. in Organic Chemistry at UC Berkeley with Professor Peter Schultz, and completed post-doctoral work in immunology at Stanford University with Professor Chris Goodnow. Dr. Shokat began his independent research career at Princeton University where he was promoted from Assistant to Associate Professor in four years.

Currently, he is an Investigator at the Howard Hughes Medical Institute, Chair of the Department of Cellular and Molecular Pharmacology at the University of California at San Francisco. He also has an appointment as Professor in the Department of Chemistry at the University of California, Berkeley. Dr. Shokat has pioneered the development of chemical methods for investigating cellular signal transduction carried out by protein kinases. He uses a combination of chemical synthesis and protein engineering to create uniquely traceable and regulatable kinases, allowing the function of over 100 different kinases to be uncovered.

Dr. Ada Yonath

Two lectures were scheduled on October 16 and 17 at the Cook-DeWitt Center and Manitou on the Allendale campus, respectively. The evening lecture on Tuesday, October 16, at the Cook-DeWitt Center, was titled "Cancer Drug Discovery: Targeting How Cells Make Decisions". The afternoon lecture on Wednesday, October 17, in 123 Manitou Hall, was titled "Chemical Genetic Analysis of Kinase Signaling Pathways".

Dr. Shokat is an accomplished scientist who has been recognized with numerous awards including being named a Fellow of several prestigious research foundations including the Pew Foundation, Searle Foundation, Sloan Foundation, Glaxo-Wellcome Foundation, and the Cottrell Foundation. He has also received the Eli Lilly Award, given to the most promising biological chemist in the country under the age of 37. He was inducted into the National Academy of Sciences (2010), the Institute of Medicine (2011), and the American Academy of Arts and Sciences (2011).

Head Full of Ribosomes

Dr. Ada Yonath won the Nobel Prize in Chemistry in 2009. She is currently Professor of Structural Biology at the Weizmann Institute of Science and Director of the Helen and Milton A. Kimmelman Center for Biomolecular Structure and Assembly in Israel. She also manages a research group at the Max Planck Unit of Structural Molecular Biology at DESY in Hamburg, Germany. Two lectures were scheduled on April 3 at the Allendale campus and Robert C. Pew Grand Rapids campus, respectively. The afternoon lecture on Wednesday, April 3, in 123 Manitou Hall, was titled "A Prebiotic Bonding Apparatus is Still Functioning in the Contemporary Ribosomes". The evening lecture on Wednesday, April 3, at the Loosemore Auditorium, was titled "The Amazing Ribosome and Its Tiny Enemies".

A pioneer of ribosome crystallography, Dr. Yonath has won numerous awards in addition to the Nobel Prize such as being the first winner of the European Crystallography Prize, established to recognize significant achievements by European crystallographers. She is also a member of the Israeli Academy for Science and Humanities. She began this work in the late 1970s, long before most scientists thought it possible to crystallize such a large, irregular structure. In 1980, she created the first ribosome crystals. Dr. Yonath is also a pioneer in the use of cryocrystallography, flash-freezing crystals, to minimize damage caused by intense X-rays.

Chemistry Faculty Receive Awards

A tradition of teaching excellence and mentorship continues in the Chemistry Department. In the 2012-2013 school year, five faculty and staff colleagues were honored with various teaching and service awards.

Shannon Biros (Assistant Professor) received the *Pew Teaching Excellence Award*. This award was established to recognize distinguished teachers from across GVSU, particularly those who use multiple approaches in the classroom, stimulate intellectual curiosity in students, and demonstrate commitment to student learning. Dr. Biros routinely teaches both upper and lower division organic chemistry courses, as well as general chemistry. Her innovative teaching involves the use of technology in the classroom, structured problem sets, and student field trips. Her students frequently praise her for being approachable, enthusiastic and supportive.

Michelle DeWitt (Laboratory Supervisor) received the *CLAS Administrative and Professional Service Award* on April 3, 2013. The College of Liberal Arts and Sciences at GVSU recognizes the dedication and hard work of its faculty and staff each year. This award recognizes outstanding college, university and professional service that goes beyond the expectations and responsibilities of the staff member's position.

Jim Krikke (Laboratory Supervisor/Instrument Support) received the *Commitment to Students Award* at the Annual Administrative/Professional luncheon held April 25, 2013 in the Kirkhof Center at Grand Valley State University. This award was established to recognize an individual A/P staff member who shows a commitment to serve as a strong mentor to GVSU students beyond their normal professional responsibilities and regardless of their professional role.

Dave Leonard (Professor) received the *Distinguished Undergraduate Mentoring Award* from the Center for Scholarly and Creative Excellence (CSCE) at GVSU. This award is intended to recognize excellence in mentoring undergraduate researchers. Dr. Leonard conducts research on the biochemical characterization of class D β-lactamases, and collaborates with a large number of undergraduate researchers in his laboratory. His work has resulted in numerous presentations and publications with GVSU student authors.

Laurie Witucki (Associate Professor) received the ESP Professor of the Year Award for 2013. The Educational Support Program (ESP) at Grand Valley serves first-generation college students in severe poverty – the University's most at-risk students – through the provision of holistic services, including academic, career, financial, and personal counseling. Their ultimate goal is to ensure that GVSU students graduate from college and go on to break the cycle of poverty in their families and communities. Each year the ESP hosts a Professor of the Year competition. Laurie Witucki was named Professor of the Year for going above and beyond her teaching duties.

Laurie Witucki was included in the list of the Top 25 Women Professors in Michigan by onlineschoolsmichigan.com. The goal of the top professors list is to highlight post-secondary educators who have been awarded recently for excellence in the classroom, on campus, and/or in the community. The complete list of award winners can be found at: http://onlineschoolsmichigan.com/top-college-professors-in-michigan/women/

BCCE 2014

The Chemistry Department is gearing up to host the 2014 Biennial Conference on Chemical Education (BCCE) from August 3 – 7, 2014. The BCCE, sponsored by the ACS Division of Chemical Education, is the largest gathering of chemical educators (middle school through college) in the world. The conference features improvements in chemistry education and the modern developments in chemistry and chemical education. Workshop and Symposium submissions will be accepted through December 6, 2013. Paper submissions run January 1 – February 28, 2014. Check out the conference website at www.bcce2014.org for more details, and join us in August if you can .

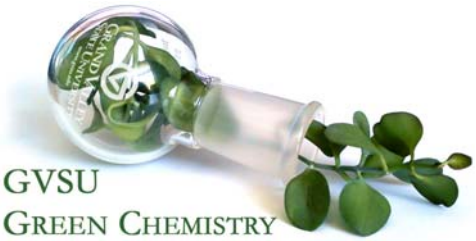
2014 BCCE Grand Valley State University *Greener on the Grand*

Green Chemistry at GVSU

In June 2013, Grand Valley State University joined a group of U.S. universities that are working together to raise awareness about the growing field of green chemistry by being among the first to sign the national Green Chemistry Commitment. This agreement, stating that **all chemistry majors, by the time they graduate, will have proficiency in green chemistry** is facilitated by Beyond Benign (http://www.beyondbenign.org), a non-profit organization that provides tools to educators to teach and learn about green chemistry to create a sustainable future.

"Green chemistry practices are increasingly seen in many industries, including health care, and can be applied to product development, patent law and quality management professions. Green chemistry includes long-term thinking, and researching and producing chemicals that are not toxic and not harmful in the long run. More and more, companies are seeking employees with sustainable skills that complement any job" said Dalila Kovacs, professor of chemistry at GVSU.

Kovacs joined representatives from other universities who signed the commitment at the 17th Annual Green Chemistry and Engineering Conference June 18-20 in Maryland. She gave a presentation about Grand Valley's program to green chemistry educators from across the country. The Green Chemistry program at GVSU began in 2006 with a special topics course of fourteen



students, and has grown to include two dedicated green chemistry courses and a green chemistry certification program. Grand Valley is one of only a few universities in the U.S., including the University of California Berkeley, to offer a green chemistry certification program. The first certified student graduated in 2011.

In addition to these stand-alone courses, green chemistry elements are incorporated in many other chemistry courses, both lecture and laboratory, from the introductory level courses into upper division courses. As the Chemistry Department works on revising the curriculum for chemistry majors and minors, the inclusion of green chemistry in the curriculum will continue to be a priority for the department. The department also remains at the forefront of green chemistry education, as one of the leading members of the Michigan Green Chemistry Clearinghouse project (http://migreenchemistry.org).

For more information about Grand Valley's commitment to green chemistry, contact George McBane, professor and department chair of chemistry, at mcbaneg@gvsu.edu (616) 331-2167, or Dalila Kovacs at kovacsd@gvsu.edu or (616) 331-3806.

~Alumni News~

Cynthia Luxford, a **2008** graduate earned her Ph.D. in Chemistry and received high praise from all of her committee members from Miami University in Ohio. Her dissertation is titled, "Use of multiple representations to explore students' understandings of covalent and ionic bonding as measured by the Bonding Representations Inventory (BRI)," and her cognate project in inorganic chemistry is titled, "A symmetry POGIL activity for inorganic chemistry." Cynthia has started a postdoctoral appointment at Iowa State University in the Department of Chemistry working for the ACS Examinations Institute focusing primarily on inorganic instruments.

Rebecca Quardokus, a **2007** graduate, completed her Ph.D. in physical chemistry from the University of Notre Dame and received the Rohm and Haas Outstanding Graduate Student Award for the 2012-2013 academic year.

Katherine Cornish, a **2006** graduate recently completed her Ph.D. in Pharmacology from the University of Minnesota. In an e-mail correspondence, Katie writes, "I finally defended my doctoral thesis and have officially graduated with a PhD in pharmacology from the University of Minnesota. My thesis work has been quite different from the work that I did as an undergraduate student with Dr. Kovacs; for the past several years, I've been working on a vaccine against nicotine that is designed to prevent relapse in newly-quit tobacco smokers. Although the vaccine has been through several clinical trials, all of my work was in vivo. The vaccine that was initially developed by my graduate lab has its own wikipedia page here: http://en.wikipedia.org/wiki/NicVAX, which explains the basic concept and some of the clinical results. It has been a long, rough road, but I am thrilled to be finished and moving on to the next challenge in life."

Gary Succaw, a **2005** graduate is now an associate professor at Montana State University-Northern. Gary writes, "It all happened so quickly this summer. Faculty colleagues have been really nice and helpful. The university is struggling for funds, but that is the current state of higher ed these days. I've also finished the first version of my chemical inventory program called Kaloschemeia (Greek construction meaning "good chemistry"). It is designed for small labs and small schools."

Chemistry Department Graduates its Class of 2013

The Chemistry Department's Class of 2013 celebrated their graduation from GVSU in April. The annual seniors' banquet was combined with the award of prizes that honors the most outstanding students in the Chemistry Department for the 2012-2013 academic year. At the combined celebration held at the Kirkhof Center in the Allendale campus, family and friends joined the graduating seniors. Also present were the faculty and staff of the Chemistry Department. The graduating seniors were Abdurahman Ahmed, Trevor Armstrong, Joseph Baumann, James Bennett, Adam Boyden, Brianne Docter, Eric Firestone, Eliscia Fought, Alexandra Gabrielli, Joseph Grit, Vivian Hasbany, Alafia Kanpurwala, Matthew Kiel, Laura Kirby, Jared Lamp, Jonathan Lehmann, Trent Mazer, Michael Peruzzi, Hope Sartain, Andrew Smith, Andy Starr, Christopher Taylor, Beth Vallier, Mark Warren, and Olivia White.

Chemistry Department Honors Students

In April of 2013, the chemistry department honored many of its most outstanding students for the 2012/2013 academic year. A total of twenty-six awards in various categories were given. The award winners in the different categories were the following.

General Chemistry Award: The general chemistry awards recognize students who show excellence in general chemistry. Every instructor who teaches CHM 115 and CHM 116 (both fall/winter sections) during the academic year has the opportunity to nominate three students per section for this award. The Scholarship and Development Committee chooses any students whose names appear on both the CHM 115 list and the CHM 116 list and give awards to those students. Names submitted from winter CHM 115 are used with the following fall CHM 116 courses. The award winners were, *Jack Bontekoe, Sarah Craven, Elliot Ensink, Jennifer Grousd, Brent Hull, Katie Kruk, Annemarie Momber, and Jamie Murawski.*

Organic Chemistry Award: This award recognizes the top students from the CHM 241/242 sequence. Instructors teaching CHM 241 and CHM 242 (both fall and winter) during the academic year have the opportunity to nominate up to two (2) students per section for this award. The Scholarship and Development Committee chooses any students whose names appear on both the CHM 241 and CHM 242 lists. Names submitted from winter CHM 241 are used with the following fall CHM 242 courses. The award winners were, *Jozlyn Clasman, Gabrielle Foxa, Ryan Hoogmoed, Edwin Klein, Ashleigh Tumey, and Nathan Winkler.*

Organic Chemist Award (ACS Poly-Ed Award): The recipient of this award was *Hollister Swanson*. This award recognizes a student that excels in the majors organic chemistry sequence (CHM 245/246/247/248). The student must be a declared chemistry major and has completed the CHM 245-248 sequence by the end of the academic year. The instructors for these courses select the student.

Analytical Chemist Award: *Lauren McCulloch* was the recipient of this award, which is given to a declared chemistry major that is outstanding in CHM 222 and CHM 225. The student must have completed CHM 225 by the end of the current academic year. The analytical Chemistry faculty selects the awardee from the best students meeting the above criteria based upon chemistry GPA.

ACS Division of Inorganic Chemistry Award: *Jared Lamp* was the recipient of this award, which is given to a chemistry major that has excelled in CHM 471. In the event that more than one student has been identified, performance in CHM 372 is also considered. The Inorganic Chemistry faculty selects the awardee based on the above criteria.

Physical Chemist Award: *Jeremy Whitmore* was the recipient of this award, which recognizes a student who has shown excellence in physical chemistry. The winner of this award is a student who has shown high performance in terms of grades and dedication in CHM 356, CHM 358, CHM 353, and either CHM 355 or CHM 455.

Biochemistry Award: The recipient of this award was *Laura Kirby*. The award is given to a chemistry major that has excelled in CHM 461, CHM 462 and 463. The student must have completed CHM 463 by the end of the current academic year. Biochemistry faculty selects the awardee based on the above criteria.

Senior Chemical Education Award: This award is given to a Chemical education major, typically a graduating senior. The Chemical Education faculty selects the awardee from the best students meeting the above criteria. The recipient of this award was *Joseph Grit*.

American Institute of Chemist Award: *Michael Peruzzi* was the recipient of this award, which is given to the senior chemistry major who meets all or most of the criteria for the Outstanding Senior Award. The Chemistry faculty selects the awardee from the eligible students.

Outstanding Senior Award: In order to be eligible, a senior, presenting in CHM 491 of the current academic year, must be a declared chemistry major and have an overall GPA of 3.5 or greater. The Chemistry faculty selects the awardee from the eligible students based upon the following criteria: Research participation; Service to the department; Extracurricular activities; and General attitude. The award recipient was *Brianne Docter*

Outstanding Undergraduate Research Award: In order to be eligible, a chemistry major must show outstanding skills, motivation, and progress in undergraduate research. This award is reserved for students that display exceptional abilities to (a) thoroughly understand their research project, (b) think critically and creatively in the research processes, (c) work independently, and (d) make significant progress in their research. In addition to participating in multiple CHM 499 and/or summer research opportunities, the awardee should also demonstrate the ability to disseminate research work to the scientific community either at regional/national conferences or through publications. Nominations for the award are be submitted by the students' research advisors in the form of a written research activity summary. The Scholarship and Development Committee then selects the award winner(s). The award recipient was *Michael Peruzzi.*

Outstanding Service Award: This award is given to chemistry major that has made significant contributions in service to the department. Nominations for the award are solicited from the department and other service related areas, and includes a summary statement of the student's service record. Service obligations may include stockroom duties, tutoring, serving as an SLA, Chemistry Club involvement, community outreach, etc. The Student Affairs Committee then selects the award winner(s). The award recipients were *Patrick Clark* and *Hope Sartain*.

Departmental Research Update

The Chemistry Department has consistently maintained as its priority research endeavor that involves the active participation of undergraduate student researchers. As in previous years, many faculty members attended regional and national meetings to present work accomplished with their undergraduate research co-workers. Herein is provided update of some faculty research activity.

John Bender completed a Fulbright Teaching-Research Fellowship working with Prof Cristian Silvestru at Babes-Bolyai University in Cluj, Romania.

Julie Henderleiter continues research on Learning in the Undergraduate Laboratory.

Debbie Herrington began the NSF funded study of the first multi-disciplinary Target Inquiry cohort. She, her two undergraduate students (Kimmy Denys and Dillon Lee), and post-doctoral researcher Tanya Gupta collected classroom observation data as well as student pre and post data from the classrooms of 29 teachers. Herrington also worked with undergraduate student Lauren McCulloch on a HRN 499 project that involved the development and evaluation of three screencasts related to limiting reactants. This past year the Herrington group gave a total of five talks and two posters at the spring National ACS meeting, the Gordon Conference on Chemical Education Research and Practice, the International Teacher-Scientist Partnership Conference and the 2013 International ChemEd Conference.

Andrew Korich continues his research in organic syntheses. The Korich group gave two presentations at the 245th national ACS meeting in New Orleans.

Dalila Kovacs worked on the following projects: (1) cellobiose and cellulose hydrogenation/hydrogenolysis in high-pressure high-temperature water with no metal catalysts; (2) evaluation of waste paper conversion into valued chemicals via hydrogenolysis; (3) green cleaning & disinfecting supplies at GVSU dinning facilities. Five undergraduate researchers worked with Dalila over the course of the 2012-2013 academic year. The Kovacs group gave three presentations in the course of the 2012-2013 academic year.

Andy Lantz and his research group continue to work on the development of capillary electrophoresis based methods for microbial separation and detection using isoelectric focusing and isotachophoresis. Such methods could potentially allow rapid identification of microbial contamination in various media, including medical, food, water, and pharmaceutical samples. Three undergraduate researchers worked in the Lantz group and the group published a paper in a peer-reviewed journal.

Chris Lawrence and his research group continue to work on Computer modeling of the mechanism of water evaporation; design of ligands for capture of lanthanides and actinides. Two undergraduate researchers worked with Chris this past academic year, 2012-2013. The Lawrence group published a paper, "Molecular Dynamics Simulation of the Condensation Coefficient of Water" published in the journal *Fluid Phase Equilibria*, 349, *83,* **2013**.

Dave Leonard and his group continue their research on the biochemistry of class D β-lactamases, with several undergraduate students working on projects throughout the year. Dave and his undergraduate research students published two papers in the 2012-2013 academic year.

Richard Lord continues his research in computational chemistry. Richard gave an invited talk on March 21, 2013 at the University of Georgia, as part of a seminar series for the Center for Computational Quantum Chemistry (CCQC). The talk was titled "Computational Insight into Unusual Redox Behavior: Spin Crossover Coupled Redox Reactions and Multielectron Transfer Events." In addition, Richard was co-author in five peer-reviewed publications in the course of the 2012-2013 academic year.

George McBane completed his 2012-2013 academic year sabbatical as a Leverhulme Visiting Professor at the University of Durham, United Kingdom. He worked with Professor Jeremy Hutson on the theory of molecular collisions at ultra-cold temperatures. The research group also had postdoc Jesse Lutz, a GVSU chemistry alumnus. During his sabbatical, George gave invited seminars at the Universities of Bristol, Nottingham, Leeds, Warwick, and Durham, and at University College London and Heriot-Watt University in Edinburgh. In addition to his sabbatical work, George maintained collaborations with scientists in Germany and Denmark, resulting in three new peer-reviewed publications: (1) "The ultraviolet spectrum of OCS from first principles: Electronic transitions, vibrational structure and temperature dependence" *J. Chem. Phys.* 137, 054313 (2012); (2) "Ultraviolet photodissociation of OCS: Product energy and angular distributions" *J. Chem. Phys.* 138, 094314 (2013); and (3) "BASECOL2012: A collisional database repository and web service within the Virtual Atomic and Molecular Data Centre (VAMDC)" *Astronomy & Astrophysics*, 553 A50 (2013).

Felix Ngassa continues his research on synthetic organic chemistry with undergraduate co-workers. Four students worked in the Ngassa group in 2012-2013 academic year. The Ngassa group gave a total of three presentations at the 245th national ACS meeting in New Orleans.

Thomas Pentecost continues his research in chemical education. Tom gave a talk, titled "Advantages of Rasch analysis using pre and post assessments in determining changes in students' conceptual understanding", at the Ohio River Valley Objective Measurement Seminar on May 3rd at the University of Kentucky. Tom also published two papers (1) "What happens when a chemistry laboratory curriculum changes" in the Journal of College Science Teaching, issue 42 (3); and (2) "Measuring Learning Gains in Chemical Education: A Comparison of Two Methods" in the *Journal of Chemical Education*.

Rachel Powers was on sabbatical for the 2012-13 academic year. She spent one month at UCSF working with Dr. Brian Shoichet on molecular docking against class D β-lactamases. At GVSU, Rachel and her research group spent the year focusing on the optimization of two classes of compounds with the potential to become the first clinical inhibitors for class D β-lactamases. A total of three undergraduates worked with Rachel and this collaboration resulted in three peer-reviewed publications. In addition, Rachel gave two invited talks, and submitted a renewal for her NIH R15 AREA grant.

Stephanie Schaertel worked with two undergraduate students on a project involving the use of a diode laser to investigate line broadening in gas phase spectra. The students gave posters at an undergraduate research conference at Michigan State University and at the GVSU Student Scholars Day. During the summer of 2012 a student from Grand Rapids Public Schools also worked on the project for his GRAPCEP (Grand Rapids Area Pre College Engineering Program) internship experience.

Randy Winchester continues his research in the synthesis of chiral silanes with undergraduate collaborators. Three undergraduate co-workers worked in the Winchester group in the course of the 2012-2013 academic year.

The Ott-Stiner Fellowship in Chemistry and Natural Sciences

Arnold and Marion Ott's daughter, Jackie, and their son-in-law, Les, today continue to uphold and exemplify the beliefs and values of Arnold and Marion – a strong belief in education, philanthropy, and assisting others to receive "a helping hand up." In 2011, they initiated the Ott-Stiner Fellowship in Chemistry and Natural Sciences. This fellowship will assist students financially and provide mentoring for students in the GVSU Student Summer Scholars Program who are focused in the areas of chemistry and natural sciences, such as physics, biology, geology, and astronomy.

Jackie & Les have generously offered a matching gift opportunity for gifts made to the Ott-Stiner Fellowship in Chemistry and Natural Sciences, through November 1, 2013. Any and all gifts to the Ott-Stiner Fellowship in Chemistry and Natural Sciences (up to a total of $10,000 raised) are eligible for the match.

If you are interested in supporting the Ott-Stiner Fellowship in Chemistry and Natural Sciences, please contact the University Development office at 616-331-6000. You may also give online at www.gvsu.edu/giving.

Target Inquiry (TI): A Multi-Disciplinary Collaboration

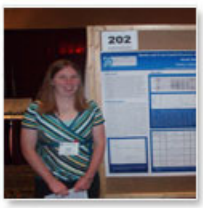
Several GVSU science faculty members spent six weeks this summer mentoring 13 area middle and high school science teachers as they conducted authentic science research projects. These teachers are part of the first TI cohort that includes science teachers from all disciplines. Teachers worked on projects including: identification and control of invasive species in area lakes; use of small mammals to measure Savannah Habitat restoration; analysis of pillow lava samples with XRF to provide evidence for glacial paths; construction of cost-effective biosand filters for water purification; study of the effects of different fatty acids on neurological stem cell development; investigation of how anatomical traits of vascular epiphytes contribute to biodiversity; use of macro-invertebrates to examine stream drift; study of antibiotic resistant bacteria; investigation of cell signaling and tumorigenisis; use of time-series lake buoy data to understand changes in Muskegon Lake; description of the environmental history of the Hemlock Crossings Park in Ottawa County by analyzing core samples; and synthesis of organic molecules with unique molecular recognition properties that could be used in toxic metal chelation therapy. The teachers will be presenting the results of their research projects this fall at the West Michigan Undergraduate Science Research Conference.

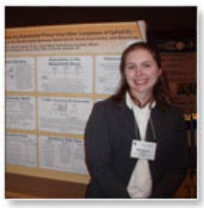
In addition to collaborating with GVSU faculty in conducting science research, this most recent cohort of TI teachers has also been collaborating with several of our science education faculty and each other as they identify ways to modify their instruction to better model for students what scientists do and bring the excitement of science to their classrooms. This is exactly the type of science instruction that is being called for in the Next Generation Science Standards (NGSS), the final draft of which was released earlier this year.

NGSS are going to require many teachers to make significant changes to the way they approach teaching and learning in the classroom and the expansion of the TI program at GVSU can help provide teachers with the support and skills they need to meet these new demands. Furthermore, the NSF funded study of the impacts of the TI program on teachers and their students, led by PIs Deborah Herrington (GVSU) and Ellen Yezierski (Miami University Ohio), will provide additional data to support the quality of the TI professional development model.

Be sure to check out the TI program at our website (www.gvsu.edu/targetinquiry). There you will find information about the program as well as the over 40 inquiry-based chemistry activities the previous cohorts of teachers in the program have developed and tested. Also, stay tuned for the new lessons that this newest interdisciplinary cohort of teachers will be developing next summer!

TARGET INQUIRY:
Improving Science Instruction






Department Faculty News

Todd Carlson was awarded the GVSU Pineapple Award in April 2013. This award is given by the GVSU Padnos International Center in recognition of outstanding hospitality shown to international students at GVSU. Todd also received a Pew International Center Grant to travel to Ankara, Turkey in May 2013.

Mary Karpen and Stephanie Schaertel have been collaborating with several other GVSU and GRCC faculty to organize and run a Science Club at City Middle/High School. Collaborating faculty include Mark Staves, Sheila Blackman, and Pat Thorpe from the GVSU biology department, Steve Mattox from the GVSU geology department, Esther Billings from GVSU mathematics department, and Tom Neils and Tari Mattox from GRCC. This club meets most weeks during the school year and does a wide variety of science activities.

Andrew Korich received a Pew FTLC Scholar Teacher Grant.

Susan & Todd Carlson with Nargilya Gasanova, an international student from Turkmenistan

Christopher Lawrence is on sabbatical for the fall semester 2013.

Dave Leonard is on sabbatical for the fall semester 2013.

Richard Lord received a Grant-in-Aid and Early Scholar Stipend from the CSCE.

Stephanie Schaertel is on sabbatical for the winter semester 2014.

Sherril Soman is still on "administrative leave", where she is serving as the University Registrar for the fall semester 2013.

Laurie Witucki is on sabbatical for the academic year 2013-2014.

Laurie Witucki, WISE faculty director, hosted a Girl Scout STEM College Experience Day for local Girl Scouts on October 13, 2013. This event was co-hosted by the GVSU Women's Center, and was attended by 42 middle and high school aged students. The Scouts conducted science experiments on topics such as electrochemistry and energy with the help of many GVSU chemistry faculty, including **Deborah Herrington, Julie Henderleiter, Thomas Pentecost, Mary Karpen, Sherril Soman**, and **Jessica VandenPlas**.

Chemistry Alumna Wins the 2012 Distinguished Alumni Award

Chemistry alumna, Dr. Maryjean Schenk earned her bachelor of science in chemistry from Grand Valley State University in 1977. She completed her medical degree at Wayne State University School of Medicine in 1983. After completing a fellowship in New York and practicing medicine in Virginia, Dr. Schenk returned to Michigan in 1991 when she accepted a position as assistant professor in the family and occupational medicine residency programs at WSUSOM. She also served as a research scientist there, at the Karmanos Cancer Institute. By 1993, Dr. Schenk had both a master's in Public Health and a master of science in Industrial Health.

In 1997, Dr. Schenk was promoted to the director of clinical curriculum development. During this time, she also chaired several organizations such as the Liaison Committee on Medical Education (LCME) and the WSU Physician Group. In 2006, when Wayne State University School of Medicine merged two departments, Dr. Schenk was appointed the inaugural chair of the new Department of Family Medicine. She has also held the position of interim associate dean of academic and student programs.

Dr. Schenk has dedicated nearly three decades to the field of medicine. She is a leader, adviser and a mentor who has made notable accomplishments in the areas of family medicine and cancer epidemiology research. She is currently Vice Dean for Medical Education at the Wayne State University School of Medicine.

In addition to her daily tasks as vice dean, Dr. Schenk serves on a variety of boards and committees, including the American Cancer Society's National Board of Directors. Dr. Schenk was chosen by the GVSU alumni association as the 2012 distinguished alumna and was presented with accolades in front of the graduates during commencement on December 8, 2012.

New Faculty 2013-2014

Paul D. Cook has joined the faculty as an Assistant Professor of Biochemistry. He graduated from Grand Valley State University with a B.S. in Chemistry (Biochemistry) in 2004 and earned a Ph.D. in Biochemistry from the University of Wisconsin Madison in 2009. After earning his doctoral degree, Paul was an NIH postdoctoral research fellow at Vanderbilt University in Nashville, TN. He then secured a position as an assistant professor of chemistry and biochemistry at the University of Mount Union in Alliance, OH. Paul's research focuses on bacterial sugar modifying enzymes, with emphasis on the elucidation of enzyme structure using X-ray crystallography and function using steady-state kinetics. This academic year, Paul will be teaching Biochemistry I and Techniques in Biochemistry. Outside of the classroom and lab, Paul enjoys gardening, cooking, and spending time outdoors.

Dr. Paul D. Cook

Chemistry Department Faculty and Students Attend the 245th National Meeting of the ACS in New Orleans, LA

Several faculty and students from the Chemistry Department at GVSU presented research results at the 245th national meeting of the American Chemical Society (ACS) in New Orleans, LA, in April of 2013. At the meeting, faculty/student presentations came from the research groups of Nathan Barrows, Shannon Biros, Deborah Herrington, Andrew Korich, Richard Lord, and Felix Ngassa. The contributions of the GVSU chemistry department are highlighted below.

Nathan Barrows and his collaborators on the NSF-funded ACELL (Advancing Chemistry by Enhancing Learning in the Laboratory) made four presentations at the meeting. During the undergraduate poster session, **Allison Kay** (GVSU) presented "Bridging the gap: A comparison of students' high school and general chemistry lab experiences," **Megan Robb** (GVSU) presented "Fun and frustration: Students' perspectives of college-level laboratories," Misha Asif (UNLV) and Akanksha Sharma (UNLV) presented "Development and preliminary analysis of the ACELL orientation to laboratory instruction survey (OLIS)". Dr. MaryKay Orgill gave an oral presentation titled "Chemistry instructors' perceptions of the laboratory learning environment." All ACELL personnel were credited as contributing authors on all presentations; this included Thomas Bussey (UNLV), George Bodner (Purdue), and Barbara Gonzalez (CSU-Fullerton).

Shannon Biros and her research group made three presentations at the meeting. Student **Hope Sartain** presented a poster along with co-authors **Michael Peruzzi**, professors Shannon Biros and **Christopher Lawrence,** and collaborator Eric Werner titled "*Synthesis, f-element complexation, Extraction and Computational Exploration of Multidentate Carbamoylmethylphosphine-Oxide Ligands: In Relation to Nuclear Reprocessing.*" This poster was also accepted for SciMix. Student **LaNora Herrema** presented a poster along with co-authors **Adam Boyden** and Drs. Biros and Werner titled "*Multidentate carbamoylmethyl phosphine oxides (CMPO's) as chelating agents for lanthanides and actinides.*" Finally, student **Michael Peruzzi** gave an oral presentation entitled *"Synthesis of Tripodal CMPO Compounds for Heavy Metal Chelation"* with Dr. Biros as co-author.

Deborah Herrington organized the symposium for the "ACS Award for Achievement in Research for the Teaching and Learning of Chemistry in Honor of Mary B. Nakhleh" and gave a talk in that symposium, co-authored by GVSU affiliate **Sheila Ryan**: "Using particulate level models to improve student understanding of difficult chemistry concepts: Applying what I learned from working with Mary Nakhleh." Dr. Herrington also gave an invited talk **"**Products of the Target Inquiry project: Quality inquiry materials made for and by high school teachers that stand up to student scrutiny" along with co-author Ellen Yezierski.

Andrew Korich and his research group gave two poster presentations at the meeting. Student **Samantha Ellis** presented the poster "Macromolecular Assemblies for Gas Storage from Dynamic Bonds." Students **Christopher Jackson** and **Cody Rogers** presented the poster "Preparation of Benzofuran Trifluoroborate Salts."

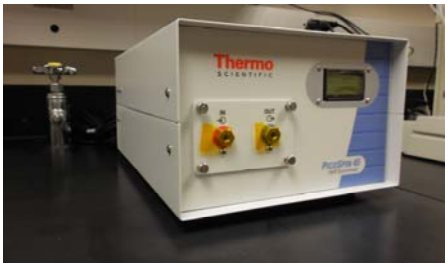
Richard Lord co-organized the symposium "ACS Award for Computers in Chemical and Pharmaceutical Research awarded to H. Bernhard Schlegel."

Felix Ngassa gave a talk titled, "Opportunities and Challenges in Undergraduate Research Mentorship" at the Symposium on Developing and Maintaining a Successful Undergraduate Research Program. Dr. Ngassa also had two student researchers in attendance at the meeting presenting posters. Student **Ibrahim Al Shaikh Dawood** presented the poster "Microwave-Assisted Cu-Free Cross-Coupling of Terminal Alkynes with Aryl Sulfonates and Vinyl Sulfonates". Student **Tyler Cooley** presented the poster, "Direct Cu-Free Sonogashira Cross-Coupling Reaction of Activated Phenol Derivatives with Terminal Alkynes".

GRAND VALLEY STATE UNIVERSITY
Chemistry Department
312 Padnos Hall
1 Campus Drive
Allendale, MI 49401

Chemistry Department Instrumentation Update

Thermo Ion Chromotograph System



Thermo picoSpin NMR

The chemistry department at GVSU has been busy updating instrumentation this past year. With assistance from the Dean's office, the department was able to purchase three new instruments.

A Thermo (Dionex) ICS-1100 ion chromatography system was purchased with suppressors for both anion and cation analysis.

A new Thermo Trace 1310 gas chromatograph (GC) with an electron capture detector (ECD) was also purchased and will replace an old Perkin Elmer unit. The new Trace unit has a modular design that will allow for easily exchanged injector or detector modules as needed. Both of these systems will run on Chromeleon 7.1. Two of our other GC's, the Focus GC with flame ionization detector and the Focus GC with thermal conductivity detector will also be converted to Chromeleon 7.1. Having our chromatography systems running on the same software platform will decrease the learning curve for the software and facilitate ease of use for both teaching labs and research.

The department also purchased a Thermo picoSpin NMR This small footprint, bench top nuclear magnetic resonance (NMR) spectrometer has a 45 megahertz (MHz) permanent magnet that will give proton NMR and not require deuterated solvents for most applications. This purchase will be very useful in the teaching laboratory setting.

A new set of spinners was purchased for the Jeol 300 MHz NMR, which continues to be a workhorse instrument for teaching and research. Additionally the Varian 400 MHz NMR has had some work done on it to improve its performance. It is now working very well and is being used by various research groups within the department.

Several vacuum pumps used for mass spectroscopy and other applications have been rebuilt due to leaks or inadequate vacuum. Other minor repairs and preventive maintenance were performed as well.