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Department Homepage:

<http://www.gvsu.edu/chem/>

2006 Arnold C. Ott Lectureship in Chemistry

The 2006 Arnold C. Ott Lecturer in Chemistry was Robin D. Rogers, distinguished research professor and Robert Ramsay chair of chemistry, Department of Chemistry at the University of Alabama. Dr. Rogers is also the director of the Center for Green Manufacturing at the University of Alabama, and the editor of ACS Journal for Crystal Growth & Design. Two lectures were held: a chemistry seminar on "The Past, Present, and Future of Ionic Liquids: From Designer Solvents to Advanced New Materials" in 123 Manitou Hall, Allendale campus; and an evening lecture on "Green Chemistry: Can Society and the Chemical Industry Co-Exist?" at the Loosemore Auditorium, DeVos center, Pew Grand Rapids campus. The evening lecture, which was free, and open to the public, was followed by a reception in the Loosemore lobby.



A Word from the Chair

Greetings to all the alumni and friends of the GVSU Chemistry Department. I hope you can take time to go through our newsletter and learn about some of the amazing things that our talented and hardworking department members are doing. Among the many changes this year, we were pleasantly surprised to find this summer that our department gained an unexpected new faculty member. This August, Dr. Thomas Haas became the fourth president of GVSU and the first President/Chemist. President Haas has a Ph.D. in chemistry from the University of Connecticut. He is also a graduate of the U.S. Coast Guard Academy and served many years in the Coast Guard working as a specialist in the area of chemical safety and toxicology. In his first few months, President Haas has demonstrated that he wants to be a "hands on" president and has even volunteered to guest lecture in some of our chemistry courses and deliver a departmental chemistry seminar.

We are also in the process of adding to our support staff and faculty. Look in this newsletter for the article about our new Biochemistry faculty, Rachel Powers.

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GVSU Chemistry Department Letter

Editor

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Department Members

Sandi Bacon
Ed Baum
John Bender
Todd Carlson
Virginia Goode
John Gracki
Mathew Hart
Julie Henderleiter
Deborah Herrington
Mary Karpen
Dalila Kovacs
Jim Krikke
Amy Kudrna
Jérôme Lavis
Christopher Lawrence
Dave Leonard
Beth Maschewske
Karen Matchett
Stephen Matchett
George McBane
Patrick Meyer
Blair Miller
Felix Ngassa
Harvey Nikkel
Aaron Perry
Rachel Powers
Min Qi
Gary Richmond
Sheila Ryan
Stephanie Schaertel
Ellen Siu
Robert Smart
Sherril Soman
Linda Stevens
David Tanis
Janet VanRhee
Brad Wallar
Randy Winchester
Laurie Witucki
Ellen Yeziarski

A Word from the Chair

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Also this fall, our department was given a permanent staff position for an Instrument Support Technician, which was immediately filled by Jim Krikke who has served in that capacity for the last two years as a temporary visiting faculty. We are also in the process filling a new staff position for an Organic Chemistry Lab Coordinator, as well as hiring a replacement for Virginia Goode, our Office Manager, who is retiring after many years of service to the Department. Then at the end of the semester, we will be interviewing for two new faculty positions (Analytical and Chemistry Education). Finally, as always, we welcome a host of new visiting and adjunct faculty.

Provost's Office Funds Purchase of High-Performance Computer Cluster

The Chemistry Department was recently awarded funds from the Provost's Office for purchase of a high-performance computer cluster for use in faculty and student computational research. The cluster will consist of eight nodes, each with two dual-core AMD Opteron CPUs. Seven faculty members have described research they expect to carry out on the cluster. The projects include molecular dynamics studies of protein folding and interactions with small molecules, quantum chemical models of clusters that include transition metal catalysts and chiral ligands, accurate quantum mechanics of atomic motions during three- and four-atom collisions, and computational modeling of the condensation process occurring at liquid-gas interfaces.

Another Chemistry Faculty Member Receives Pew Teaching Excellence Award

A tradition of teaching excellence remains strong in the Chemistry Department. This year, Bradley Wallar (Assistant Professor) joined his colleagues Stephanie Schaertel, Robert Smart, and Stephen Matchett, who are previous winners of the Pew Teaching Excellence Award in 2000, 2001, and 2005 respectively.

Faculty Members on Sabbatical 2006-2007 School Year

Laurie Witucki is currently on sabbatical at the Van Andel Research Institute (VARI) in Grand Rapids, MI. She is working in the group of Dr. Cindy Miranti, whose focus is on understanding the mechanisms by which certain receptors, called integrins, regulate cellular processes involved in the development of cancer.

Sherril Soman will be on sabbatical in the winter of 2007. She will be working on using lab practical data to assess the changes in the CHM 115 and CHM 116 lab experience.

Ott Lectureship Pictures



T. Carlson, D. Kindschi & Dr. Rogers



D. Kindschi & Dr. Rogers



T. Carlson & Dr. Rogers



Undergraduate Students Present Research At The 231st National Meeting of The American Chemical Society



From L to R; J. Lutz, E. Blamer, and K. DeKorver

Target Inquiry Launches at GVSU with \$1.3M NSF Award

After two years of planning and securing funding from national and private foundation grants, Ellen Yeziarski and Deborah Herrington are excited that their innovative professional development program for high school chemistry teachers has been launched at GVSU. The program, called Target Inquiry (TI), is designed to improve the frequency and quality of inquiry instruction in high school chemistry. The TI program spans 2.5 years and is comprised of three main components: (1) a chemistry research experience for teachers (RET); (2) inquiry materials development; and (3) action research study of implemented research materials. Support for the first cohort of ten teachers in the TI program was made possible by an award of \$116,750 from the Camille and Henry Dreyfus Foundation 2005 Special Grant Program in the Chemical Sciences.

This summer, ten area high school teachers completed the RET. Mentored by chemistry research faculty, the teachers carried out chemistry research projects to gain a better understanding of the process of scientific inquiry and better equip them to model inquiry for their students. At the end of the summer, the majority of the teachers presented their summer research along with our undergraduate students in a Chemistry Research Poster Session. The response from both teachers and chemistry faculty regarding the first phase of this program has been very positive and we have already seen more positive outcomes of the high school teacher/chemistry faculty collaborations than we had anticipated. In the remaining phases of TI, teachers will develop an inquiry-based high school chemistry curriculum which they will implement in their classroom and study its impact.

A \$1.3 million NSF grant will support Herrington and Yeziarski's five-year study of the TI program, allowing them to impact professional development beyond west Michigan. Julie Henderleiter and Sherril Soman also played a vital role in the development of the TI program and will assist with the study. Additionally, the TI study provides opportunities for undergraduate students to do research in chemistry education. Brittlund Winters has been working with the TI project from the beginning, collecting and analyzing baseline data. Brittlund was able to present her work at the 19th Biennial Conference on Chemical Education this past summer at Purdue University. Cynthia Luxford joined the team this summer and will be continuing her work on the project through the 2006-2007 school year. Finally, Laura Kennedy, a master's student in education, joined the TI team this fall.

Chemistry Students Present Research at the 231st National Meeting of the ACS

Three undergraduate chemistry majors, Emily Blamer, Kyle DeKorver, and Jesse Lutz presented their research results at the 231st national meeting of the American Chemical Society in Atlanta, GA. These students did research under the guidance of Randy Winchester, Felix Ngassa, and Dalila Kovacs respectively.

Summer 2005 Graduates

Grant Ball

Sarah Vasquez

Fall 2005 Graduates

Tricia Bensted

Elizabeth Girnys

Winter 2006 Graduates

Andrew Berke*

Emily Blamer**

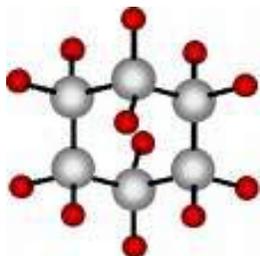
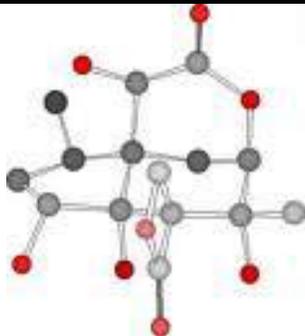
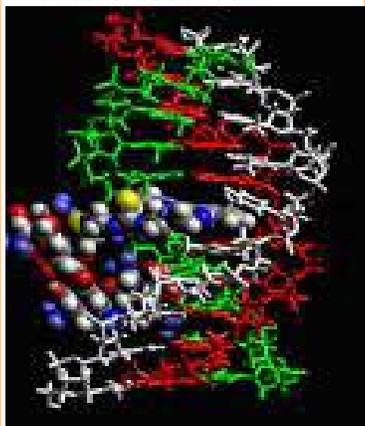
Shannon Edwards

Gillian Kupakuwana

Michael Kuszpit

Theothora Melistas

Aranda Slabbekoorn



* Outstanding Senior Award

**American Institute
of Chemistry Award

Chemistry Department Instrumentation News

The department recently added a new FT-IR (Jasco 4100) to one of our organic labs. In reality, we are seeing a few of our existing instruments become obsolete and no longer supported. The new Jasco FT-IR, equipped with an attenuated total reflectance (ATR) cell, will replace one of the workhorse Perkin-Elmer IRs that so many of our students have used since the early 90's. In addition to a new, computerized FT-IR, we have added new Pike ATR sampling accessories to all of our IRs. All three FTIRs in the department now have ATR capability which essentially eliminates sample preparation and allows high throughput for teaching-lab use.

Single bounce ATR accessories allow users to obtain IR spectra of solid samples in a very short period of time. The powder is simply placed on a ZnSe or diamond crystal and a hard metal plate presses the powder down on the crystal to provide a solid contact between the powder and the crystal. Scans can be taken immediately. Can our past students imagine obtaining an IR spectrum without grinding KBr with the sample? These new sampling devices will greatly speed up the process for obtaining good IR spectra.

The department was also the recipient of a generous donation of hexane over the summer. Through the work of one of our alumni Matt Bosma, Burdick and Jackson of Muskegon donated boxes and boxes of hexane to our program. In the summer of 2005, we added a solvent purification system from Innovative Technologies that allowed us to decommission a number of our solvent stills, which was a tremendous move for safety reasons. We are now looking for funds to add one more solvent line to our solvent purification rack so that we can take down our last still, the still that purifies hexane.



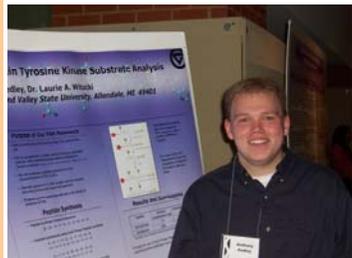
The New FT-IR in the Organic Lab PAD 367

Flinn Chemistry Workshop Hosted at GVSU

Grand Valley State University's Chemistry Department and the Regional Math and Science Center hosted the Flinn Scientific Foundation summer workshop for chemistry teachers June 26-30. Financial support was received from the department, the science center, Western Michigan ACS, and the university.

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Pictures from Student Scholarship Day (SSD) 2006



Anthony Pedley at Student Scholarship Day 2006



Aranda Slabbekoorn at SSD 2006



Katherine Cornish at SSD 2006



Doug Barth & Brian Smith at SSD 2006



Emily Blamer at SSD 2006

Flinn Chemistry Workshop Hosted At GVSU

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The teaching team included award-winning high school chemistry teachers: Kathy Dombrink from St. Louis, Steve Long from Arkansas and Jeff Bracken from Ohio. Forty high school chemistry teachers attended the workshop including teachers from as far away as California, Georgia and New York. Half of the participants stayed on campus for the workshop week. Seventeen of the teachers attending were from the immediate west Michigan area.

Each workshop participant left with a thick binder of printed teaching materials, laboratory activities, chemical demonstrations, teaching tips, and classroom management techniques. In addition, each teacher assembled numerous "make-and-take" items for classroom demonstration and laboratory use.

Eleven of the participants elected to receive GVSU graduate credit and over fifteen participants received continuing education credits for their involvement in the workshop. Evening activities included a trip on the D.J. Angus where teachers had an opportunity to try the various chemical and physical tests comparing water samples from Spring Lake and Lake Michigan. Many participants also joined West Michigan Whitecaps fans at a baseball game on Tuesday of the workshop week.

This workshop continues the department's strong support of pre-college chemical education. This was the fourth Flinn Foundation workshop co-sponsored by the department and is similar to the numerous Woodrow Wilson teacher workshops sponsored in the 1980s and 1990s.

Department Faculty News

Laurie Witucki earned tenure this fall and was promoted to associate professor. She is currently on sabbatical at the Van Andel Research Institute (VARI) in Grand Rapids, MI

Sherril Soman earned tenure this fall and was promoted to associate professor. She is teaching this fall, but will be on sabbatical in Winter 2007.

Robert Smart was promoted to full professor. He also continues to coordinate the organic division as a senior faculty member.

Debbie Herrington and her husband had a daughter, Lexi, in the summer.

Gary Richmond is on phased retirement from teaching. He teaches a reduced load in the fall semester, while he spends his time in the winter semester doing work on his house.

New Faculty 2006-2007

Rachel Powers has joined the faculty as an Assistant Professor of Biochemistry. She is a native of west Michigan, born and raised in Grand Haven and Spring Lake. In 1992, she graduated with high honors from Michigan State University with a B.S.T. in Chemistry and Education. After graduation she worked for several years as a laboratory technician at Amway Corporation before deciding to return to graduate school.

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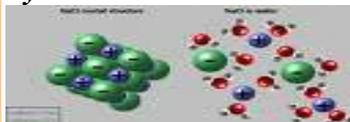
Jesse Lutz at SSD 2006



Maysee Salleva at SSD 2006



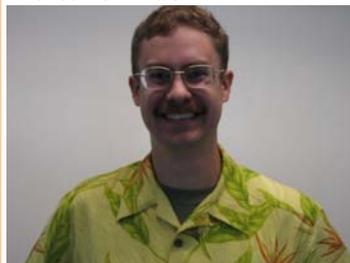
Kyle DeKorver at SSD 2006



New Visiting Instructors



Amy Kudrna, teaches CHM 115 & 231 Lab



Patrick Meyer, teaches CHM 102 & 109

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She attended Northwestern University in Chicago for her graduate work in the Integrated Graduate Program in the Life Sciences. In 2002, she received her Ph.D. in Structural Biology and Biochemistry, with Dr. Brian K. Shoichet as mentor and thesis advisor. Following graduate school, she was a postdoctoral researcher at Michigan State University in the laboratory of Dr. Michael Garavito. Her research interests include structural biology, x-ray crystallography, structure-based drug design, antibiotic resistance, and beta-lactamases.



In addition to the tenure track position, our department also has two new Visiting Instructors joining us this fall. **Patrick Meyer** received his Ph.D. in Chemistry from Western Michigan University. He is currently teaching CHM 102 and CHM 109. **Amy Kudrna** has an MS from Northern Michigan University and teaches CHM 115 lecture

as well as some sections of CHM 231 laboratory. The department also has new adjuncts helping out with the teaching of some of our labs: Jerry Driver, Alaina Furr, James Ledrick, Cynthia Luxford, Kristina Mack, Jill Morris, Chris Penzien, and Brittlund Winters.

Departmental Research Update

Debbie Herrington and Ellen Yeziarski are continuing their research this fall on Target Inquiry (TI). Three students, Brittlund Winters, Cynthia Luxford (undergraduate chemistry majors), and Laura Kennedy (graduate student in education) are working with the TI team this fall.

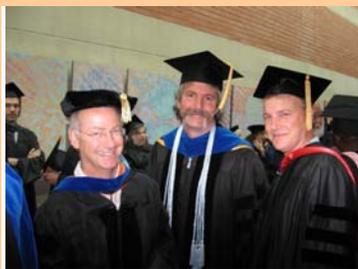
John Bender continues his research on main group organometallic chemistry. A research paper from work completed during his sabbatical leave has been accepted for publication in *Organometallics*.

Dalila Kovacs continues her research on hydrogenation and green chemistry. Dalila gave an invited talk on "Toward Understanding Metal-Catalyzed Polyol Hydrogenolysis in Aqueous Media" at the 10th Annual Green Chemistry & Engineering Conference, held in Washington, DC June 26-30, 2006. She also reviewed three chapters from a new Organic Chemistry textbook written by David Klein, the author of *Organic Chemistry as a second language*.

Jim Krikke continues his work of troubleshooting the instruments in the department and making sure faculty and students can use all the instruments more efficiently.

Min Qi is continuing her research project "Behavioral and Kinetic Studies of Non-planner PCB-52 and 153 Injected Goldfish". In the summer of 2006, Brian VanZanten, a high school teacher and Wei Wu, a UM undergraduate student, worked with Min on her research project: kinetics and toxicity of lead on the gold fish. More than 100 gold fishes were tested.

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Randy, Steve & Blair at Convocation 2006



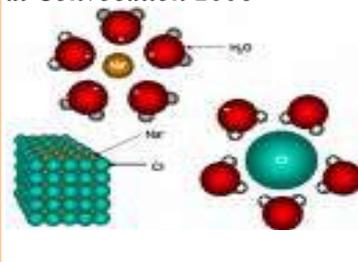
Mary, Ellen, Sherril & Rachel at Convocation 2006



Dave, Harvey & Gary at Convocation 2006



Rachel, John & a colleague at Convocation 2006



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After the detection limit of the method was determined, research focused on the elimination and distribution pattern of Pb. Both intracranial and intraperitoneal injections with Pb were conducted. The preliminary results suggest Pb does pass blood-brain barrier; significant amount of Pb was detected in both brain and body separately. The research completed over six weeks in summer has made for a good starting point for future studies. Neurotoxicity of Pb injected gold fish will be examined through collaborative studies with Dr. Xu in the psychology department at GVSU.

Christopher Lawrence continues his research in computational chemistry. Two of his students, Nathan Siladke and Kevin Duong, presented their work at the Midwest Undergraduate Computational Chemistry Conference over the summer. The conference was held at Iowa State. Nate's presentation was on "Water Evaporation From Tropospheric Aerosols", while Kevin's was on "Vibrational Spectroscopy of Carbonmonoxymyoglobin".

Dave Leonard has three research students this fall. Brian Smith is working on "Kinetic Analysis of a Low-Turnover Mutant of the Class D Lactamase OXA-1". Angela Bopra is working on the "Synthesis and Characterization of an Omega-Loop Deletion Mutant of the Class D Lactamase OXA-1". Sarah Toman is working on "The Purification of Class A and Class D Lactamases Using Cibracron Blue Agarose".

Steve Matchett continues his research on NMR kinetics and relative reactivities of metal olefin complexes.

George McBane continues his research in computational and experimental physical chemistry. He had a paper published in the Journal of Statistical Software. He is also coauthor of a textbook for the junior-level physical chemistry lab course, "Experimental Physical Chemistry: A Laboratory Textbook", with Arthur M. Halpern of Indiana State University. The book was published by W. H. Freeman in summer 2006.

Felix Ngassa continues his research on the synthesis of modified nucleosides. Two of his research papers were accepted for publication; one is already published in *Organic Letters* while the second will appear in the *Journal of American Chemical Society*. The Ngassa group currently has four undergraduates doing research this fall.

Stephanie Schaertel worked with two Target Inquiry teachers (Debra Johnson and Peter Larsen) on a project centered on the construction of an inexpensive Raman spectrometer for the detection of protein structural changes. The Schaertel group also participated in a poster session organized for TI teachers on July 26.

Robert Smart continues his research on the synthesis of Polyimide and PBO materials.

Sherril Soman continues her research on the use of lab practical data to assess the changes in the CHM 115 and CHM 116 lab experience.

Brad Wallar continues his research in the area of protein interactions. His research group had a paper published in the *Journal of Biological Chemistry*.

Randy Winchester worked with two students this summer continuing research into the synthesis of chiral silanes. Chad Meese worked on a project started by Emily Blamer last summer looking at steric effects on enantioselective substitutions.

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Tim Ewald joined the group through the new Masters in Chemical Education program and was looking at Grignard reagents as possible nucleophiles in enantioselective substitutions. This fall Amy Buth rejoined the group and is continuing work on a project investigating platinum complexes of strained allenes as potential antitumor agents.

Alumni Notes

Jessica Blunt-Hessler, a 2000 graduate, got her Ph.D. from the University of Michigan in 2006 and is now a postdoc with Craig Webb at the Van Andel Research Institute (VARI), in Grand Rapids, MI. She writes, "I am now living in the Grand Rapids area doing a post-doctoral fellowship with Craig Webb at the Van Andel Institute. So far, working at the Institute has been great. Everyone is very friendly and there seems to be a lot of collaboration going on between groups, which I like. My project is focused on developing targeted nano-devices for imaging and treating pancreatic cancer using dendrimers as platforms for delivery. Craig's lab has a great database for looking at the genetic signature of a variety of tumor tissue samples and cancer cell lines. I have already identified a number of extracellularly expressed membrane targets for pancreatic cancer and am excited to begin validating these targets in vitro. The Institute isn't really set-up for chemical synthesis work, so that will be a little challenging, but I think the project is worth the extra effort. I am also learning a lot about genetics and proteomics."

Kris Brazin received her Ph.D from the University of Iowa in NMR of proteins and is doing a postdoc at Harvard Medical School. She writes, "My husband and I have been out in Boston for about 3.5 years now working as postdocs. We had a baby boy in October, Emerson Robert Mallis. He is doing very well and is a highly motivated child. He is crawling already at 5 months and is really curious. It takes a lot of energy to keep up with him. As well, I think he has a serious allergy against sleep!"

Brian Wysocki, a 2003 graduate and his wife had a new baby, Braden Michael Wysocki.

Student Scholarship Day 2006

The Chemistry Department was again well represented at the 11th Annual Student Scholarship Day in April 2006. More than a dozen Chemistry students presented their research results in either oral or poster form.

Please Update Us on News About You!

Name _____ Date: _____

Address _____ Graduation Year: _____

Please return by US Mail or send by e-mail to ngassaf@gvsu.edu . Thanks!