



Chemistry Department Letter

NUMBER 18 October 2004

A Word from the Chair

Greetings to all members (past and present) of GVSU's Chemistry Department. I am writing to you as the new Chair of the Department. I took over as Chair, replacing Harvey Nikkel who provided the department with 15 years of service and leadership. During his tenure as Chair, Harvey saw the department grow from seven to twenty five tenure track faculty members. In addition, we have five permanent support staff personnel and two permanent affiliate faculty. New this year are Felix Ngassa (organic chemistry) and Chris Lawrence (physical chemistry). Also we have hired Jim Krikke in a half time instrument support / half time teaching position. We can all thank Harvey for the growth and success of the department over the past 15 years.

I start as chair during a period of many other changes. After many years of being part of the Division of Math and Science, the University has this year reorganized and placed the Chemistry Department in the new College of Liberal Arts and Sciences (or CLAS). Our new Dean, Fred Antczak, has the enormous task of melding units of the old Math and Science Division with units from the Social Sciences, Arts, and Humanities. This makes for a lot of change and uncertainty, but we are all working hard to make the transition as smooth as possible. All of this is taking place during a time of economic uncertainty along with continued growth in enrollment, especially in the Chemistry Department. Needless to say, this promises to be a challenging, yet rewarding year for us all.

On top of all of the changes in administration going on, we are also dealing with major changes in our departmental curriculum. A couple of years ago our department implemented the most ambitious overall revision of our curriculum in many years. These changes are

being phased in as our majors work through the new system. In this second year of the new curriculum, we are for the first time offering major revisions in our sophomore organic and analytical chemistry courses. Starting next year, we will be offering a much enhanced upper-level Professional Emphasis Curriculum. Also this year we are in the process of developing a Chemistry Concentration for the Master's of Education program. By offering graduate level chemistry education courses we hope to enhance the teaching abilities of our local high school chemistry teachers.

We encourage all chemistry alumni to come by and check out all the changes going on here at the GVSU Chemistry Department. Or stop by "virtually" at our department web site at www.gvsu.edu/chem/ or by e-mail.

Todd A Carlson
Chair, Department of Chemistry

Pfizer donates Equipment to GVSU

It was known in the summer of 2003 that the Holland, Michigan R&D division of Pfizer Pharmaceutical was going to close its doors. With the loss of such a large facility, there were certainly numerous rumors regarding the disposition of the equipment within that tremendous facility. After weeks of speculation, the Chemistry Department found itself on a short list of eight local schools who would become recipients of a major equipment donation from the Holland facility. Dr. James Zeller, Director of R&D at Holland, played a pivotal role in ensuring that numerous local schools would benefit from the difficult situation that his Pfizer facility was going through.

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GVSU Chemistry Department Letter

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

Pfizer Equipment

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Throughout the fall, GVSU chemists coordinated with the Pfizer chemists to establish areas of instrumentation needs, and in November 2003 a lottery system helped finalize which schools obtained which donated pieces of equipment. Once the decisions were made and equipment metered out, a number of professors and students and Jim Krikke, our new analytical instrument technician who was also a Pfizer employee up to that point, made a mad-dash to box and transport all the materials. Dr. Smart, in particular, enjoyed the gleaning process in those organic laboratories.

In the end, Chemistry along with the Annis Water Resources Institute Laboratory obtained almost a million dollars of chemical equipment and supplies. The major piece of the donation package was an almost brand-new Varian 400 MHz NMR. The Organic Support laboratory has been

essentially an NMR facility now housing two research grade NMR's. With the growth of our organic enrollments and number of synthetic researchers, one NMR simply couldn't keep up with the demand, and thus, the timing could not have been better for the department. Additionally, the department was able to obtain several HPLC systems, a GC-MS, a GC, several reactors, and a remote sensing FT-IR. Since the Pfizer R&D group was so heavily involved with organic synthesis and pharmaceutical analysis, our stockroom benefitted greatly in the area of volumetric and organic glassware and supplies.

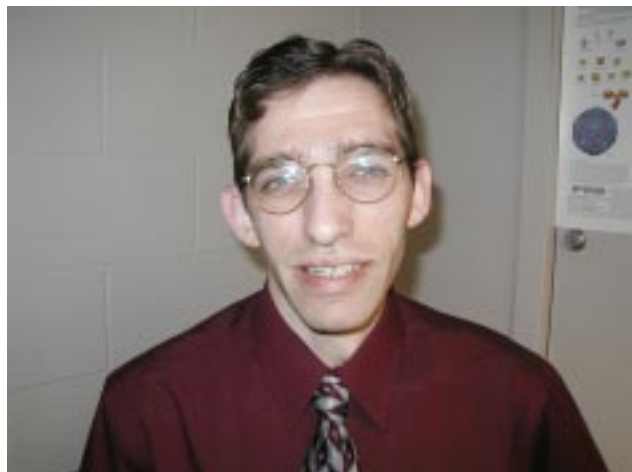
The department is saddened by the loss of numerous professional colleagues within that R&D group at Holland, but the donation of equipment will certainly benefit our incoming students in the teaching labs and research labs for years to come. We are, indeed, grateful to the many Pfizer chemists who helped make the donation process successful.



GVSU organic professors Gary Richmond (l) and Randy Winchester standing next to the boxed Varian 400 MHz NMR donated to GVSU by Pfizer.

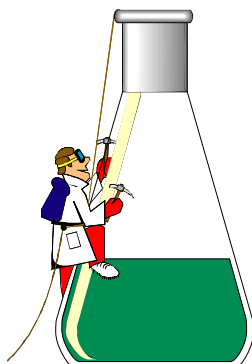
New Physical Chemistry Position

Christopher Lawrence is originally from Los Angeles and received his B.S. in Chemistry from the University of



Physical chemist, Christopher Lawrence

California-Los Angeles. His Ph. D. from the University of Wisconsin-Madison is in Physical Chemistry. For the past year, he conducted post-doctoral research in Madison with Prof. Jim Skinner studying the dynamics of supercritical fluids. Chris is teaching physical chemistry courses and laboratories as an assistant professor. His research interest will look at the dynamics of hydrogen bonding fluids.



New Organic Chemistry Position

Felix Ngassa is a native of Cameroon, West Coast of Central Africa. He received a B.S. in Chemistry from the University of Yaounde. His Ph.D. from the University of North Dakota is in Organic Chemistry and Physical Chemistry. Prior to joining the department as a



Organic chemist, Felix Ngassa

tenure track faculty, Felix did postdoctoral work at Michigan State University and was a Visiting Assistant Professor of Chemistry at GVSU. Felix is teaching Introduction to Organic Chemistry lecture and laboratories as well as laboratories in the year-long organic sequence. His research interest is in the area of modified nucleosides and heterogeneous foldamers.

Department Faculty News

John Bender received a GVSU R&D grant to start a new project in organometallic synthesis, and will be submitting a sabbatical proposal to work at Notre Dame next Fall in x-ray crystallography of these same organometallic compounds with Prof. Ken Henderson.

Francis Burns has been active in local ACS activities, presently acting as chair of the Western Michigan ACS.

Todd Carlson has assumed the responsibilities as department chair (see "A Word from the Chair," page 1)

Julie Henderleiter is beginning to research the use of online homework assignments in General Chemistry. She was assisted this summer by her research student, Kelly Engleman.

Debbie Herrington has been working with Ellen Yeziarski on the development of an innovative professional development program for high school chemistry teachers. She also gave two talks at national conferences based on incorporating more active learning strategies into teaching of large lecture courses.

Mary Karpen continues designing web-based tutorials and animations, and currently is focusing on RNA computational biochemistry studies.

Dalila Kovacs tested the use of the "Organic Chemistry as a Foreign Language" by Klein, D.R., published by Wiley & Son, Inc, in 2004, in her CHM 241 Class during the winter semester of 2004. The textbook was highly rated by her students and she strongly recommends the use of it as an auxiliary tool in the introductory Organic Chemistry classes.

David Leonard has an active undergraduate research program studying GTP-binding proteins and beta lactamases and continues his involvement in the development of GVSU's Cell and Molecular Biology program.

George McBane presented work at the 2004 Gordon Research Conference on Atomic and Molecular Interactions. In the first half of 2004 he published two papers in the *Journal of Chemical Physics* with collaborators at Kirtland Air Force Base and Emory University on energy transfer in carbon monoxide. He also visited the Department of Physics at Wesleyan University in May 2004, to give a short course on quantum collision theory to the Stewart research group and help them get started with a series of calculations. McBane was promoted to Associate Professor in 2003 and granted tenure in 2004.

Blair Miller continues to handle some of the departmental administrative duties as Assistant Chair. In addition, he is also collaborating with Bruce

Hardy, a previous GVSU professor in Anthropology, on the analysis of lipids in fire-cracked rocks.

Prof. Harvey Nikkel was on sabbatical leave during the Winter 2004 semester. He worked with Dr. Brian Haab at the VanAndel Research Institute in Grand Rapids doing research on protein microarray technology. The ultimate goal of the project is to develop a high throughput technique that can be used for early detection of pancreatic and prostate cancer. Since Prof. Carlson is now serving as Chair of Chemistry, Prof. Nikkel is back to teaching full-time and is thoroughly enjoying the change.

Min Qi continues teaching the same classes, and continues her gold fish neurotoxicity research.

Stephanie Schaertel continues her research collaboration with George McBane. They are investigating applications of highly sensitive diode laser based IR absorption spectroscopy to environmental detection. Three research students were involved in the project last year and two are signed up for this year. Also, Stephanie Schaertel, Mary Karpen and Julie Henderleiter had a paper published in the *Journal of Chemical Education* in April, "Integrating Computational Chemistry into the Physical Chemistry Laboratory Curriculum: A Wet Lab/Dry Lab Approach".

Sherril Soman continues to remain active in curricular issues at the departmental and college level. She was involved in developing the new curricular materials for the proposed Masters in Education (Chemistry Concentration) and editing the 2004 -2005 General Chemistry Lab Manuals.

Dave Tanis is spending the fall semester at UC Berkeley working with Mark Kubinec on a project to digitize the Berkeley intro chem course.

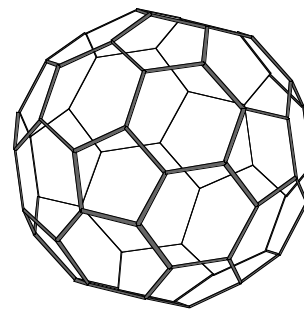
Brad Wallar has an active undergraduate research program, which included two summer students and an active collaboration with Van Andel Institute. Past work has led to two publications and a presentation at the annual meeting of the American Society for Biochemistry and Molecular Biology.

Randy Winchester is continuing his research into new methods for synthesizing chiral silanes. In the spring he was busy arranging for the installation of a new Varian Innova 400MHz NMR donated by Pfizer.

Laurie Witucki has involved several students in research at the Biochemistry/Organic interface. Specifically, the projects involve the study, synthesis, and design of peptide substrates and combinatorial peptide libraries via the solid phase method for the use as tools to probe protein kinase specificity. She has spent time developing and writing a lab

manual for the survey of Organic chemistry course. Witucki also received the 2004 GVSU Outstanding Teaching Award.

Ellen Yeziarski's research in chemical education focuses on the development, implementation, and study of a Chemistry Concentration for the M.Ed. program at GVSU.



Younger Chemists (Under 35) Wanted!!!

We are in the beginning stages of bringing together a core group of Western Michigan ACS members to establish a local YCC (Younger Chemists Committee) section. The National goals of the YCC are to help younger chemists become more involved with the ACS and provide networking to help integrate younger chemistry into the profession. To this end involvement in the YCC can provide younger chemists with opportunities including funds to travel to regional conferences and attend Leadership Development Workshops. Three local members (Michelle DeWitt, Debbie Herrington, and Joel Stray) have attended such workshops and found them to be very useful.

At the local level YCC sections act as both social and service organizations focusing on the needs of younger chemists. Potential activities for a

local YCC section include presenting seminars on topics such as resume writing, job searching, or graduate school, participating in the local ACS education night, hosting semi-annual social dinners for younger chemists and their families, and becoming involved with community service activities such as science fair judging or speaking to high school/college classes. We plan to have an organizational meeting at the end of September to identify the needs and interests of younger chemists in west Michigan and set out goals for our local YCC section. We are hoping to find 5-8 people to form a core leadership group. This group will be setting the agenda for the year. If you would like to be part of the core group or would like to be informed about upcoming activities, please contact Joel Stray, joels@gentex.com.

Undergrad Research Update

This past summer, **Mary Karpen** and her research student, **John Schwartz**, evaluated the ability of different forcefields to model RNA hairpins.

Julie Henderleiter is beginning to research the use of online homework assignments in General Chemistry. She was assisted this summer by her research student, **Kelly Engleman**.

Tonya Leeuw and **Andrea Rice**, who worked with **George McBane** and **Stephanie Schaertel** doing undergraduate research in 2003 and 2004, have graduated. Tonya is in graduate school in chemistry at Rice University, and Andrea is teaching science and math with the Peace Corps in Ghana. **Mandy Hennip**, a former member of their group, is in her second year of graduate school at the University of Wisconsin, Madison. Two new students have signed on to work with Schaertel and McBane in the Optics Lab this fall, and a new, top of the line optical table has now been installed there to provide a stable platform for their laser-based research.

Brad Wallar has two students working with him. **Jessica Schoenherr** presented her research entitled "Protein interactions that regulate the function of the Diaphanous-related Formins" at the Student

Summer Scholars Showcase Night. She was also able to present some of her work at the Van Andel Institute. **Brittany Stropich** started her research on a formin protein by generating directed mutations in specific amino acids that are implicated in the regulation of protein function.

Randy Winchester had his research student, **Shannon Edwards**, present a poster at the National Conference on Undergraduate Research Conference titled "Synthesis of Chiral Silanes." **Michael Kuszpit** joined the group in May and made significant contributions this summer, including developing a method to analyze the enantiomeric selectivity of the reactions using chiral HPLC.

Kermit Sharp worked with **Debbie Herrington** this summer to pilot the use of OWL (On-line Web-based Learning) in organic chemistry.

Qian Wu, a graduate student of West Michigan Tech, worked with **Min Qi** during the summer of 2004. They collected a lot of data. They are planning to have their results submitted to *Toxicological and Environmental Chemistry* for publication. Qi also received a R&D grant recently, which will support her toxicological research of goldfish.

Dalila Kovacs started an active undergraduate research program. The program is meant to contribute to the general effort of investigating new

avenues for converting renewable resources to commodity chemicals and for implementing the green chemistry principles in the use of classical conversion procedures. The acquisition of a 450 ml Parr Reactor, a generous gift from Pfizer, allowed her students to effectively start running high pressure-high temperature hydrogenolysis experiments.

Ajdin Kavara, research student with **Dalila Kovacs**, present a poster at the NCUR Conference in Indianapolis titled "Cis- and Trans-1,3-Cyclohexanediol Isomerisation under Heterogeneous Hydrogenolysis Conditions". Ajdin is now a graduate student at University of Michigan.

Grant Bailey, research student with **Dalila Kovacs**, presented a poster coauthored with Ajdin Kavara, at the GVSU Student Scholarship Day entitled "Aqueous-Phase Heterogeneous Hydrogenolysis of 1,3-Cyclohexanediols". He continued working with Dalila during the Summer being involved in a research project meant to collect and compile the existing literature data about mechanistic pathways of diols hydrogenolysis. He presented his work in a session of the Summer Chemistry Seminar Series.

Cynthia Luxford, a chemistry major sophomore this Fall, started work with **Dalila Kovacs** as a Summer Scholarship Student. She successfully

completed the project "Aqueous-Phase Heterogeneous Hydrogenolysis of cyclic diols as models of Biomass-Derived Feedstock" and presented her results during the Summer Chemistry Seminar Series as well as a poster and short talk at the Summer Student Scholarship Showcase. Cynthia found the work in the lab challenging but attractive and rewarding. She will continue working with Dalila this Fall.

This past summer, **Dave Leonard** worked with Junior chemistry major **Sarah Vasquez** on developing a new enzyme purification and characterization lab for upper level biochemistry students.

Angela Karst recently graduated from **John Bender's** group. She presented a poster on organophosphorus chemistry at the April 2004 NCUR conference, and is now attending graduate school in chemistry at Michigan State. **Jesse Lutz** is continuing work in his group on organometallic synthesis, and **Brian Smith** joined his group this Fall.

Recent students who have worked in **Laurie Witucki's** lab are **Jaime Curtis** ('04, currently at MSU), **Doug Feenstra**, **Lauren Sanford**, and **Beth Girnys** (all seniors at GVSU). In the spring of 2004, Jaime Curtis and Lauren Sanford presented their work at the NCUR conference in Indianapolis.

Research presented at NCUR

The following GVSU faculty and students presented papers at the National Conferences for Undergraduate Research (NCUR) held at Indiana University-Purdue University Indianapolis, April 15-17, 2004

John Bender with student Angie Karst, *Synthesis and Characterization of Orthotrifluoromethylaryl phoshines*

Dalila Kovacs with student Ajdin Kavara, *Aqueous-Phase Heterogeneous Hydrogenolysis of 1, 3-cyclohexanediols*

Dave Leonard with Paul Cook, *The binding of Cdc42Hs and the CRIB-72 domain of mPAK-3.*

Steve Matchett with student Ryan Hoekstra, *Twice as Nice, Producing Conducting Polymers by Solving the double Nitrogen Substitution on Metal Olefin Complexes.*

George McBane and Stephanie Shaertel with students Tonya Leeuw and Andrea Rice, *13 C/12 C Measurements with Diode Laser Based Absorption Spectroscopy*

Robert Smart with student Jen Nyland, *Variations of Polyimide Precursor and the Resultant Microsphere Diameter*

Robert Smart with student Sarah Barnhard, *The Relationship of Polyimide Foam Properties to Monomeric Structure*

Randy Winchester with student Shannon Edwards, *The Synthesis of Chiral Silanes*

Laurie Witucki with student Lauren Sanford, *FAK Tyrosine Kinase Substrate Determination*

Laurie Witucki with student Jaime Curtis, *Tyrosine Kinase Substrate Analysis and Fluorescence Assay Development*



At NCUR 2004: Front: Jen Nyland, Angie Karst, Ryan Hoekstra, Lauren Sanford, Prof. John Bender. Middle: Prof. Laurie Witucki, Jaime Curtis, Andrea Rice, Tonya Leeuw, Sarah Barnhard. Back: Prof. Dave Leonard, Prof. Robert Smart, Paul Cook

Please let us know what you have been doing lately!

Name _____ Date: _____

Address _____ Year of graduation: _____

Return by US Mail or send by e-mail to the editor, Dave Tanis at tanisd@gvsu.edu, including the above information. Thank you very much!

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