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# Department of Chemistry

www.uiowa.edu/~chemdept/

## The View From the Front Office

The view out the windows of the Department office has changed a great deal over the past year. Across the Cleary Walkway, the Blank Honors Center is now open, and construction of the Pomerantz building is well underway. But while these new buildings reflect major changes in the UI physical plant, the view within the Chemistry Department is undergoing changes that are equally dramatic.

Just a few weeks ago, the Governor signed a bill including authority for renovation and new construction in the Chemistry Building, and a few days later the Regents gave their final approval to the plans for this project. As shown in the floor plans below, by the time this effort is complete, some "venerable" parts of the building will disappear and new and renovated spaces will take their place, providing new labs and classrooms for teaching and research. The initial phase of the construction will begin yet this summer, leading to relocation of Chemistry Stores and removal of the greenhouse from the east wing roof. The central part of the project will begin next spring.

These significant changes in our physical circumstances are met with equally significant changes in our personnel. Two stalwarts of our faculty have entered new phases of their careers, with Don Burton

beginning a phased retirement and Dwight Tardy joining the ranks of our emeritus faculty. Two new faculty members joined us this year, physical chemists Claudio Margulis and Chris Cheatum, and two analytical chemists will arrive this fall (Don Cannon and Gary Small).

We've also seen some significant changes in our graduate student classes. Substantial increases in TA support from the College of Liberal Arts and Sciences, and from the Graduate College for Presidential fellowships, have had a significant impact on our graduate recruiting. Over the past year we've also added two new lecturers (Russell Larsen and John Krstenansky), a new Director of Undergraduate Laboratories (Karen Meade), and a new Research Scientist to lead the Department's NMR facility (Santhana Velupillai).

These many changes reflect the support of the College of Liberal Arts and Sciences and the UI in general for the Department of Chemistry, as well as the centrality of chemistry to higher education. As one illustration of that centrality, last fall our two largest introductory courses in general chemistry (4:7 and 4:11) had a combined enrollment of almost 2,000 students when the entering "freshman" class was only about 4100.

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We taught both of these large courses again in the spring semester.

It's clear that the coming year will hold its share of challenges. We will continue our efforts to recruit talented new faculty members, to attract outstanding new graduate students, and to lobby for attention to our needs for modern space for teaching and research. This will have to be done against the backdrop of a weak economy, decreasing state support, and increasing enrollments. Yet with the continued dedication of the faculty and staff in this Department, and the support of the College, our alumni, and our many friends, the view from the front office is very bright.

David Wiemer

### By the Numbers Teaching and Research in the Department of Chemistry — 2004

<b>24</b>	<b>tenure/tenure-track faculty</b>
<b>5</b>	<b>visiting assistant professors</b>
<b>2</b>	<b>lecturers</b>
<b>110</b>	<b>graduate students</b>
<b>72</b>	<b>undergraduate majors</b>
<b>18</b>	<b>postdoctoral associates</b>
<b>5</b>	<b>research scientists</b>
<b>19</b>	<b>professional staff members</b>

Current 3<sup>rd</sup> Floor of Chemistry Building



Proposed 3<sup>rd</sup> Floor Expansion & Renovation



## Broad-Based University Recognition for Successful Chemistry Faculty

It was a good year for Chemistry faculty awards and recognition from the University. Professor Vicki **Grassian** is the recipient of the 2004 – 2005 *James Van Allen Natural Fellowship*. This competitive University award is designed to recognize and encourage creative research in the physical, natural, and mathematical sciences. Grassian will use the funds from this award to facilitate new experimental strategies to gain a better understanding of the chemical processes that occur on atmospherically relevant mineral dust particles.

Professor James **Gloer** was recognized for successful research and teaching, and dedicated service with a *Collegiate Fellow Award* from the College of Liberal

Arts and Sciences (CLAS). Note that two other Chemistry professors (Arnold and Wiemer) received this award in pre-



(from left) Grassian, Gloer, and Larsen Franklin pictured below

vious years and now Chemistry faculty account for 23% of all Collegiate Fellows.

Professor Sonya **Franklin** was honored by the CLAS Dean, Linda Maxson, with a *Dean's Scholar Award*, which recognizes her excellence in teaching and research and provides funding to help support her research and teaching endeavors.

Professor Sarah **Larsen** received a *University Faculty Scholar Award* that provides her with the opportunity to spend extended periods focusing on her research efforts on the synthesis and characterization of novel nanoscale zeolite crystals, which may find utility as adsorbents and environmental catalysts.

## Successful Entrepreneur to be Honored as a Collegiate Alumni Fellow

A former undergraduate chemistry student in our Department, Dr. Jerry **Sudarsky**, will be honored as an *Alumni Fellow* in fall 2004. The collegiate Alumni Fellows program recognizes alumni for their outstanding contributions to society, their professions, the College of Liberal Arts and Sciences, and The University of Iowa. Sudarsky came to the University of Iowa in the mid-1930s with two loves in mind, sports and chemistry. However, after three years playing intercollegiate baseball and pursuing scientific studies, hard financial times forced him to postpone the rest of his education. Through persistence and determination, he eventually finished his degree at

Brooklyn Polytechnic, and then served in the U.S. Navy.

In 1946, Sudarsky started a biotechnology company, the Bioferm Corporation, that utilized fermentation processes to produce vitamins. This company was successful and at the forefront of biotechnology long before it was popular! Sudarsky holds numerous patents in industrial microbiology from his time at Bioferm and sold the company in 1960. In the early 1970s, he was Vice Chairman of the Board of Daylin, Inc., a company that owned a chain of pharmacies. From 1986 to 1994 he was Vice Chairman of the Board of JEG, a company that develops services for the pharmaceutical and biotechnology industries. In 1994, he

founded Alexandria Real Estate Equities, Inc. and currently serves as the company's Chairman. Alexandria owns and develops facilities for the pharmaceutical and biotechnology industries.

In addition to his corporate successes, Sudarsky has worked on science policy for the United Nations and the country of Israel, and serves on boards of education at several prestigious universities. He has also endowed the Sudarsky Center for Biotechnology at Hebrew University in Israel. We look forward to meeting our new Alumni Fellow during his UI visit next fall. We congratulate Dr. Sudarsky for his professional and personal triumphs since attending the University of Iowa!

## Two Faculty Clear Tenure Hurdle

Professors Sonya **Franklin** and Norb **Pienta** both earned tenure this year. Franklin's research on bioinorganic chemistry has received wide national recognition. Her research focuses on engineering chimeric peptides that have the potential for producing tunable and specific biocatalytic reactions. Pienta's growing chemical education research program also has received national distinction. His particular focus involves utilizing technology in creative ways to en-

hance active and participatory learning in the classroom. Pienta earlier had earned tenure as an organic chemist at the University of Arkansas, so he is now an expert on this process.

The Department congratulates both colleagues on their success. We wish them the best for a long and productive career at Iowa. They will help us reshape UI Chemistry and usher our Department successfully forward into coming decades.



Franklin and Pienta

## Professors Build Ladders and Tunnel Their Way to Success

If you are an American Chemical Society member, you may have noticed that University of Iowa Chemistry faculty appeared in several recent issues of *Chemical and Engineering News*. Two of our assistant professors were profiled in articles describing their recent scientific adventures.

Professor Len **MacGillivray**'s research on the synthesis of complex ladderane structures using solid-state templates that preorganize reactive alkene precursors was profiled in the January 5, 2004 issue. This preorientation allows subsequent photolytic reactions to achieve near quantitative ladderane production, a feat unrivaled by conventional ladder-

ane syntheses. This is also "green" organic chemistry since it is conducted without solvents! MacGillivray's ladderane work was also featured on the cover of a recent issue of *Angewandte Chemie*.

Professor Amnon **Kohen** was profiled in the February 23, 2004 *C&E News* issue as a contributor to the ongoing debate of the importance of hydrogen tunneling and protein dynamics in enzyme-based catalysis. Recent research from the Kohen group provides experimental evidence to support the contribution of hydrogen tunneling and enzyme motion to enzymatic catalysis. You may remember that we profiled Kohen and MacGillivray in our 2002 newsletter

in recognition for their receipt of National Science Foundation CAREER Awards and they certainly have capitalized on their early successes.



MacGillivray and Kohen

## Analytical Chemistry Gets a Big Shot in the Arm

We are happy to introduce two new Analytical Chemistry faculty members who will be joining us later this year. In truth, one of these "new" hires is actually a returning colleague. Professor Gary **Small** started his academic career at the University of Iowa before moving to Ohio University in 1991. He earned a Ph.D. degree from Penn State University in 1984 and a B.S. degree from the University of North Carolina in 1979. At Ohio University, Professor Small received many awards including an Ohio University Presidential Research Scholar Award and a U.S. Army Distinguished Service Award. His research program has maintained long-term collaborations with UI Professor Mark Arnold's research pro-

gram and their renewed proximity will certainly enhance this interaction. Small's research interests span chemometrics and infrared spectroscopy as they relate to the areas of biological and environmental chemistry.

A new Assistant Professor will also join the Analytical Chemistry division this fall. Dr. Don **Cannon** comes to our department after a productive research period as a Beckman Fellow at the Beckman Institute for Advanced Science and Technology at the University of Illinois. He received a B.S. Chemistry degree from the University of Pittsburgh in 1993, an M.S. degree in Analytical Chemistry from the University of South Dakota in 1995, and a Ph.D. degree in Analytical Chemis-

try from Pennsylvania State University in 2000. Dr. Cannon's research interests lie in the broad area of bioanalytical chemistry, centering on the fabrication and application of novel measurement systems, such as nanoscale electrochemical architectures, to probe chemical dynamics at the single-cell level. His objective is to better understand the chemical basis of critical processes underlying neurochemistry and cancer.

Both of these new faculty will have an immediate positive impact on our analytical teaching and research programs. Their research interests will likely lead to a diverse array of new interdisciplinary collaborations at the University of Iowa. We eagerly await the arrival of these colleagues who will bring new and exciting scientific expertise to our department!

## Emeritus Club Gains a New Member



Professor Dwight **Tardy** has decided to move on to new challenges after a much-appreciated 35-year career in our Department. Upon his arrival at Iowa in 1969, Tardy quickly distinguished himself as a physical chemistry expert in gas-phase chemical kinetics of radical reactions. His work has application to atmospheric chemistry on other planets, such as Saturn, and he has strong long-standing col-

laborations with research groups at NIST and NASA. Over the course of his teaching career, Tardy took an active hand in shaping our modern physical chemistry and instrumental analysis curricula. He was always ready and willing to shoulder more than his fair share of Departmental service on key infra-

structural, hiring, and promotion committees. He also helped revitalize our annual newsletter, provided important student mentoring as a long-serving undergraduate chemistry major advisor, and chaired the committee that devised our current graduate study guidelines. Tardy also spearheaded the introduction of computers to UI Chemistry, including bringing the first IBM PCs to faculty desktops, building our first departmental internet system, and creating our first undergraduate computer laboratory. In recent years, Tardy shifted his focus to chemical education and introduced handheld computer data acquisition tools into the undergraduate laboratories. He was also a resolute sounding board for Departmental faculty in official and unofficial contexts. Tardy's ever present passion and independent views helped shape innumerable teaching and research decisions over several decades. The Department will miss Dwight's independent voice and wishes him and his wife, Vicki, the best for an active and fulfilling next chapter in life's adventure.

## 2004 Iowa Undergraduate Chemistry Awardees and New Honors Degrees

Several undergraduates presented their research at the spring 2004 Undergraduate Poster Session. At this time, the departmental undergraduate awards were announced. The **Chemistry Alumni Award** recipients were Gillian **Woodburn** (sophomore), Steve **Purtle** (junior), and Erik **Alexander** (senior). Other student awardees included Laura **Parker** (**Ken Sando Undergraduate Scholarship**), Cianan **Russell** (**American Institute of Chemists Award**), John **Gourley** (**Analytical Chemistry Award**), Samer **Arafat** (Merck Index Award), and Julia **Brimeyer** (**CRC Press Freshman Chemistry Award**).

There were 14 undergraduate Chemistry bachelors degrees awarded during the 2003-2004 year. Several of the above awardees graduated with honors (advisor in parentheses), namely Alexander (Goff), Arafat (Bowden), and Russell (Messerle). They are joined by Angela Hunt **Wolf** (Leddy) and Stephanie **Fischer** (Leddy) who also graduated with honors. Congratulations to these dedicated and successful undergraduate chemists and best wishes to our recent graduates!!



(from left) Brimeyer, Purtle, Parker, Woodburn, Russell, Arafat, Alexander, Gourley, Tharp, and Prof. Ned Bowden (Chemistry Awards Committee Chair)

## Graduate Students Snare Prestigious Presidential Fellowships

One of the most prestigious awards that a new graduate student can receive is the University of Iowa's **Presidential Graduate Fellowship**. This award covers tuition and fees for two years of the student's graduate career and only about 25 awards are made each year.

The Chemistry Department is proud that four of our graduate students have received Presidential Fellowships over the past few years. They are 2001 awardee Stephen

**Deyrup** from Stetson University, 2002 awardee Samantha **Soebbing** from Bradley University, and 2003 awardees Sarah **Hill** from Michigan Technological University and Jason **Vanlerberghe** from University of South Carolina. This fellowship program helps encourage strong prospective students to join our university family. We wish these students much success as their scientific careers move forward.



(from left) Deyrup, Soebbing, Vanlerberghe, and Hill

## Alumnus Generates Electricity from Vodka and Enzymes

Chemistry Department alumnus Professor Shelley **Minteer** (Ph.D. in 2000 under the direction of Professor Johna Leddy) has recently garnered international press and recognition for her exciting discoveries in fuel cell technology as an Assistant Professor of Chemistry at Saint Louis University in St. Louis, Missouri. Minteer and her students devised a clever strategy using enzymes and common alcohols, such as vodka, that are combined to form an "enzymatic" fuel cell to generate electrical power. Her group's fuel cells do not need catalytic metals, in contrast to conventional fuel cells. These new biofuel cells were initially reported at the ACS National Meeting in Anaheim, California in spring 2003 and the story has been picked up by

web sites worldwide (France, Italy, Brazil, and Germany, to name a few). If you search "Shelley Minteer" on Google, you can read these for yourself, including several that have dubbed this discovery as the "Absolut™ Power cell".

Earlier this year, Minteer and one of her graduate students, Nick Akers, established a startup company to pursue the commercialization of their fuel cell discoveries. The department is proud of Minteer's recent accomplishments and we raise a glass of "fuel" to her continued success!



Minteer with a prototype of an enzyme fuel cell

Next year is the 150<sup>th</sup> /  
Sesquicentennial  
Anniversary of our  
Chemistry Department

The first Chemistry  
courses were taught by  
our founding professor  
Josiah Whitney during the  
University's first year of  
instruction (1855).

## UI Physical Sciences Embrace Nanoscience and Acquire New Nanoscale Analysis Tools

The Optical Sciences and Technology Center (OSTC, [www.ostc.uiowa.edu/](http://www.ostc.uiowa.edu/)), under the direction of Chemistry Professor Mark **Arnold**, co-sponsored the first UI symposium in the emerging area of nanotechnology ([Nanotech@UI](mailto:Nanotech@UI), [nanotech.uiowa.edu/](http://nanotech.uiowa.edu/)) in fall 2003. The daylong lecture series highlighted how nanoscience and nanotechnology pervades numerous research areas across campus including Chemistry, Physics, Geoscience, Chemical and Mechanical Engineering, Computer Science, and Biology. This was not the nanoscience of fictional and destructive nanomachines as portrayed in the book *Prey* by Michael Crichton, rather it showed the university community what are the real scientific challenges in creating and manipulating nanoscale structures. The afternoon student poster session was a standing room only affair with lively and animated discussions taking place all around the room. The inherently interdisciplinary nature of

most nanoscale science projects has stimulated multiple collaborative research projects among researchers in Chemistry and the other campus physical and biological science disciplines.

In a Chemistry-centered nano-context, Dr. Russell **Larsen** (with Professors Sarah **Larsen** and Norb **Pienta**) was successful in obtaining a two-year grant from the National Science Foundation through their Nanotechnology in Undergraduate Education program. The grant is entitled "Illuminating Nanoscience with Semiconductor Quantum Dots" and it will facilitate the development and incorporation of new laboratory experiments involving semiconductor quantum dots and nanoparticles into the UI undergraduate chemistry curriculum.

The successful execution of cutting edge nanoparticle and nanostructural materials characterization critically relies on access to precision analytical instrumentation.

The university's Central Microscopy Research Facility (CMRF, [www.uiowa.edu/~cemrf/](http://www.uiowa.edu/~cemrf/)) provides easy access to state-of-the-art high-resolution electron microscopy and other nano-analytical techniques. A new addition to this facility is an advanced multi-technique surface analysis system that integrates an X-ray photoelectron spectrometer (XPS), an Auger spectrometer, and an ultra-violet photoelectron spectrometer (UPS) into a single unit. This key piece of new university instrumentation was mainly funded by the National Science Foundation through a successful grant application written by Professor Vicki **Grassian** with assistance from Chemistry Professors Ed **Gillan** and Ned **Bowden** and Civil and Environmental Engineering Professor Michelle **Scherer**. This new \$800K addition to UI will have an immediate impact on university research projects focusing on nanoscale materials science, nanoparticle catalysis, atmospheric particle chemistry, semiconductor materials synthesis, and surface monolayer studies.

### The Cost of Chemical Sciences and Education A Selected History of Chemistry Building (CB) Construction

<b>1920s</b>	<b>Current Chemistry building is constructed: ~ \$1.5 million</b>
<b>1962</b>	<b>Chemistry annex built (northwest wing of CB): ~ \$1.2 million</b>
<b>1964</b>	<b>Chemistry auditorium built (225 CB): ~ \$400,000</b>
<b>1968</b>	<b>Southwest wing renovation: ~ \$300,000</b>
<b>late 1980s</b>	<b>West wing renovation: ~ \$9 million</b>
<b>1998</b>	<b>5<sup>th</sup> floor renovation: ~ \$1.5 million</b>
<b>2005</b>	<b>new undergraduate laboratories replace 300 CB lecture hall plus major CB research upgrades/renovation: ~ \$35 million</b>

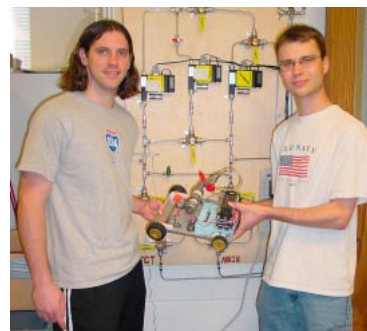


Kratos Axis Ultra XPS system

## Fuel Cell Researchers Turn Power into Motion

Wayne **Gellett** and Luke **Haverhals**, graduate students in Professor Leddy's research group, utilized their expertise in H<sub>2</sub>/O<sub>2</sub> fuel cells to assist a UI Chemical Engineering class with the design of a "chemically powered" vehicle. They built a working fuel cell car that was entered in a regional competition in Oklahoma. The metal catalyst in the fuel cell

oxidizes H<sub>2</sub> and reduces O<sub>2</sub>, resulting in the production of water and electricity that supply power to motors attached to the car's front wheels and to fans next to the fuel cell stack. The car was judged as one of the most original designs and it will perform again at the national competition in Austin, Texas.



Haverhals and Gellett with their fuel cell car and the H<sub>2</sub> filling station in background. Gellett's thumb is on the black stack of multiple fuel cells.

**Your generous contributions to our Department and University support people and help promote scientific advances such as those you see on these pages.**

## Pienta Uses Chemistry to Take on the Butter Cow at the Iowa State Fair

In August 2003, Professor Norb **Pienta** designed and manned a UI Chemistry booth at the annual Iowa State Fair in Des Moines. Hopefully, some of you stopped by to see him. The booth highlighted some of the recent exciting changes that have taken place in our General Chemistry sequence with the theme of "Using Chemistry and Light to Measure What is in Water." This display had hands-on examples of how light can be divided into different colors. Visitors also used red cabbage to test the acid and base properties of common household chemicals.

According to Pienta, the local competition was fierce and he noted, "The 'butter cow' lady pulled all stops this year by making a butter Harley-Davidson in honor of their 100<sup>th</sup> anniversary. Given this level of

competition, I will be packing my trusty lab heat gun." Attendance was so good at Pienta's booth (over 400 visitors!) that he luckily did not need to melt his competition. As you can see from the photos below, Pienta (in blue shirt) provided fun and excitement for visitors of all ages - from 8 to 80!



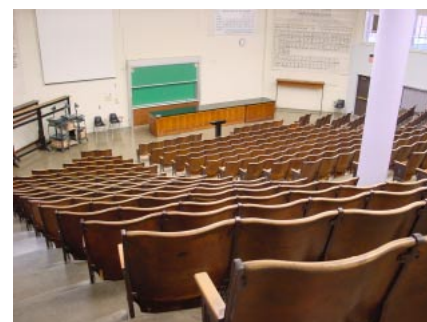
## Working Weekends are Enjoyed by Regional Attendees

The Working Weekends at the University of Iowa (WW@IA) have quickly become key departmental regional outreach and graduate student recruiting events.

In fall 2003, we returned to familiar themes of NMR (solution and solids), EPR, and mass spectrometry. This 4<sup>th</sup> departmental WW@IA event was coordinated by Professors Sonya **Franklin** and Sarah **Larsen** and it was a very well-attended affair, as you can see by the group photo below. A diverse group of

students and faculty from regional colleges spent 1 1/2 days learning experimental techniques, analyzing their samples, and interacting with UI faculty and students.

In spring 2004, Professors Ned **Bowden** and Chris **Cheatum** coordinated the 5<sup>th</sup> WW@IA event that focused on organic/inorganic synthesis and spectroscopy. Professor Lou **Messerle** led a section focused on air-sensitive synthetic techniques, complete with an eye-opening demonstration on the very pyrophoric nature of diethyl zinc. That was a definite crowd pleaser!



### A last look at the old 300 CB

Starting in 2005, major renovations will turn this ancient lecture hall into a multistory suite of interconnected undergraduate teaching laboratories.

## Molecule-of-the-Week Invades Downtown Iowa City

Professor Sonya **Franklin** developed a series of colorful placards highlighting examples of common molecules found in everyday life. These placards were based on items from Franklin's General Chemistry lectures and they were posted in the Java House, a downtown Iowa City coffee house, for several weeks. Customers were frequently overheard commenting on the chemistry placards, so we consider this as one of the Department's stealth efforts to enhance the chemical IQ of our community and voting public. Franklin and Professor Norb **Pienta** describe the molecule-of-the-week strategy in an upcoming issue of the *Journal of Chemical Education*.



placards from left: fireworks, sunscreen, TNT, plastic, catnip, hops

## Peter Hatch Turns Molten Sand into the Necessities of Synthetic Science

Chances are good that if you practiced synthetic chemistry at the University of Iowa sometime in the past 27 years, you had some occasion to call upon Peter **Hatch**'s glassblowing expertise. Peter has been the Chemistry Department's resident glassblower since 1977. His interest in the design and repair of scientific glassware dates back to a chance encounter with a New York City glassblower who directed him to New Jersey's Salem County Technical Institute. Peter enrolled in the school's two-year scientific glassblowing program and after finishing his training; he became an apprentice glassblower at the University of Notre Dame. After six years at Notre Dame, he worked as a glassblower at Case Western Reserve in Cleveland for several years before moving to the University of Iowa.

In addition to saving and restoring function to the experimental glassware of innumerable graduate students, Peter efficiently handles frequent requests from other campus departments, mainly from the medical school and affiliated areas. Some of the unusual glass work requests he has gotten over the years have certainly put his glassblowing skills to the test, but he always seems to find a workable solution. Peter has also frequently demonstrated the basic techniques of scientific glassblowing to new generations of undergraduate chemists in the Inorganic Laboratory course. They truly appreciate his expertise once they attempt their own glassblowing in the laboratory.

Peter has provided consistent, friendly, and distinguished service to many University researchers and was recognized

for his efforts with a 1996 State Board of Regents Staff Excellence Award. On fair weather days, you can be sure to spot Peter riding in to work on his trusty bicycle.



Peter Hatch - UI Chemistry Glassblower

## New Teaching and Staff Members Keep the Chemistry Enterprise Running Smoothly

In fall 2003, Dr. Russell **Larsen** relinquished his position as Director of Undergraduate Chemistry Laboratories to take on a lecturer position in the department. This change gives Larsen more contact teaching time with undergraduates and allows him more time to pursue independent research and teaching projects in the summer. As you saw on page 5, he has already been successful in securing NSF funding for nanoscience activities.

Dr. John **Krstenansky** is another new lecturer, and he and Larsen have the primary responsibility for teaching the case study sections in our recently restructured General Chemistry courses. Krstenansky is a medicinal chemist with 19 years experience in the pharmaceutical industry at the scientific, managerial and executive levels. He received his Ph.D. in Medicinal Chemistry from the University of Illinois and an M.B.A. from Golden Gate University in Los Altos, California. He has worked in both large pharmaceutical companies and smaller biotechnology enterprises. He has current interests in deciphering the mechanism of action of neoclerodane and the chemistry, pharmacology and toxicology of certain commercial plant products. Outside of the lab, Krstenansky is a pilot and has founded Straka Ventures, an angel network fo-

cused on investment in biotechnology, medicine and technology companies in Iowa and the surrounding states.

Karen **Meade** takes over the reins as Director of Undergraduate Chemistry Laboratories. Meade received her B.S. in Chemistry from the University of Iowa, followed by M.A. and M.S. degrees from the University of Northern Iowa (UNI), and most recently a Ph.D. in Science Education from the University of Iowa (advisors: Norbert Pienta and Robert Yeager). After earning her B.S. degree, Meade spent 12 years teaching science to students in grades 7 - 12. In addition to teaching, she coached girls softball and basketball and assisted with Science Fairs. Meade earned several fellowships during her graduate career and was a visiting assistant professor at UNI prior to taking her current position in our department. Her outside interests include playing guitar, singing, swimming, and many outdoor activities, such as biking and tennis.

With ever increasing undergraduate student numbers, we are fortunate to have had the assistance of several new visiting assistant professors this past year.

Dr. Mustafa **Selim** comes to the UI Chemistry teaching program with an extensive background in areas including pharmaceu-

tical research, toxicology, and environmental health. He received a B.S. and M.S. in Chemistry from the University of Cairo, followed by a Ph.D. in Analytical Chemistry and postdoctoral training from the University of Mississippi. Selim most recently directed the UI College of Medicine's Analytical Toxicology Laboratory.

Dr. Ron **Erickson** and Dr. Faiza **El Shafie** also joined our visiting professor ranks and assisted in various crucial aspects of our undergraduate lecture and laboratory teaching missions.

With our increases in faculty, students, and research and teaching efforts, comes the increased need for capable staff support. We welcome Sandy **Cosgrove** to the front office assisting David Wiemer (Chemistry DEO), Tim **Koon** to the Chemistry Stores operation, and Dr. Santhana **Velupillai**, who takes over the helm as NMR Facilities manager. Finally, Jeffrey **Miller** recently returned from a year of National Guard service in Bosnia and resumes his diligent oversight of our daily departmental computer hardware and software challenges.

Please join us in giving a big welcome and thank you to these new additions to our department.

## Good News and Updates From the Chemistry Faculty

Ned **Bowden** co-organized a symposium on "Self-assembly in Nanoscience" at the AAAS meeting in Seattle in February 2004. He also received a Research Innovation Award from the Research Corporation for a project entitled "The First Controlled Synthesis of Hollow Organic Nanotubes for the Templated Growth of Inorganic Nanomaterials".

Don **Burton** presented several invited lectures in the past year at the ACS National Meetings in New York (Fall 2003) and Anaheim (Spring 2004) and in our department's Frontiers in Chemistry Lecture program (Fall 2003). He is also the Plenary Speaker at the ACS Winter Fluorine Conference in St. Petersburg Beach, FL (January 2005).

Ed **Gillan** was elected as the 2005 Chair of the Solid State Materials subdivision of the ACS Inorganic Chemistry Division. He also received a grant from the Army Research Office (with Johna Leddy) to produce carbon nitrides for fuel cell supports and a grant from the National Science Foundation to investigate solvothermal routes to nanoscale metal nitrides. His recent carbon nitride work and its Pauling connection was profiled in the May 31, 2004 issue of *Chemical & Engineering News*.

Vicki **Grassian** was awarded a Two-Year Extension for Special Creativity by the National Science Foundation. These awards are made by nomination of the NSF program officers and are only given to a few top principal investigators in the Chemistry Division of NSF. This rare

grant extension offers Grassian the opportunity to pursue adventurous, high-risk scientific inquiries. She will use these new funds for a project entitled "Chemical Reactions of Environmental and Atmospheric Relevance on the Surface of Oxide Particles".

Jan **Jensen** is co-organizing (with Sharon Hammes-Schiffer at Penn State University) a symposium on Quantum/Classical Calculations in Chemistry and Biophysics at the Fall 2004 ACS National Meeting in Philadelphia.

Sarah **Larsen** was awarded a grant from the Army Research Office (with Vicki Grassian) to investigate the use of nanocrystalline zeolites for decontamination of chemical warfare agents and toxic industrial chemicals. She also presented an invited talk in the "Nanotechnology and the Environment" symposium at the ACS National Meeting in March 2004.

Johna **Leddy** continues to have success studying magnetically modified electrochemical systems. She has filed five patent applications and received two grants from the Army Research Office (STTR program) to support collaborative work on developing CO tolerant indirect reformation fuel cells. Leddy also co-organized two symposia for the Electrochemical Society, "Fuel Cells" in spring 2003 and "Transport in Complex Media" in spring 2004. She was also re-elected Treasurer for the Society for Electroanalytical Chemistry.

Len **MacGillivray** received the 2004 In-

ter-American Photochemical Society Young Investigator Award and obtained research funding from Honda to study "Gas Storage within Inverted Metal-Organic Frameworks". He also presented several invited international lectures on template-based solid state synthetic methodologies at a European Research Council workshop in St. Malo, France (April 2004), at the 86<sup>th</sup> Conference of The Canadian Society for Chemistry in Ontario, Canada (August 2003), and at a Molecular Crystal Engineering EuroConference in Acquafredda di Maratea, Italy (June 2003). MacGillivray has also given national invited presentations at an NSF Young Investigator Workshop on Supramolecular Chemistry, as well as several others at scientific society meetings and at Caltech and Texas A&M University.

Dan **Quinn** was presented with the T. L. Temple Foundation Discovery Award from the Alzheimer's Association. He was Vice-Chair of the 3<sup>rd</sup> International Isotope Effects Symposium in Uppsala, Sweden in 2003 and is a member of the International Scientific Advisory Committee for the 8<sup>th</sup> International Conference on Cholinesterases in Perugia, Italy in 2004. He serves on the National Institute of Health Physical Biochemistry Study Section.

Jason **Telford** continues to serve as President of the Iowa section of the American Chemical Society. He also received a grant from the ACS Petroleum Research Fund for a project entitled "Development of Outer-Sphere Ligands for Environmental Radionuclide Remediation".

### Chemistry Research in 2003

external seminar speakers  
39

published papers  
79

patents (filed and issued)  
7

research expenditures  
\$3.6 million

## New Postdoctoral Associates and Visiting Scientists Help Drive Research Enterprise

Visiting scientific professionals are a key component in maintaining and growing premier research programs. Our current cadre of visitors hail from a wide range of international research programs. The names of new scholars joining our department since spring 2003 (or mistakenly not noted in the 2002 newsletter) are (research director, Ph.D. institution and degree year listed in parentheses): Anatoly **Chernyshev** (Kohen, Saratov State University, Russia, 1999), Claude **Mertzenich** (MacGillivray, Luther College professor on sabbatical), Andrew

**Mobley** (Messerle, Grinnell College professor on sabbatical), Jonathon **Olesberg** (Arnold, University of Iowa-Physics, 1999), Kiran (Bollapragada) **Rao** (Eyman, Oklahoma State University, 2003), Siddhesh **Shevade** (Eyman, University of Pune, India, 2000), John **Thurston** (Messerle, Rice University, Texas, 2003), Kasinadar **Veluraja** (Margulis, Indian Institute of Science, Bangladesh, 1983), Chang Tong **Yang** (Messerle, National University of Singapore, 2002), and Yibo **Zhou** (Messerle, Nankai University, China, 2002).



## Graduate Degrees Awarded in 2003 - 2004

There were 8 M.S. Chemistry degrees awarded in the past year (advisor's name in parentheses): Farzad **Fani-Pakdel** (Telford), Meijun **Hei** (Arnold), Sheuli **Jha** (Bowden), Siqi **Li** (Wiemer), Adam **Mattox** (MacGillivray), Michael **Ott** (Goff), Larry **Shull** (Wiemer), and Jinzhou **Zhang** (Linhardt).

There were 12 Ph.D. degrees awarded in Chemistry over the past year. They are (advisor's name and dissertation title in parentheses): Hind **Al-Abadleh** (Grassian, Heterogeneous Reactions of Atmospheric Gases on Oxide, Carbonate and Soot Surfaces), Drew **Dunwoody** (Ledy, Magnetically Modified Polymer Electrolyte Fuel Cells and Low Temperature Effects on Polymer Electrolyte Nafion), Tasneem **Islam** (Linhardt, Syn-

thesis of Glycosaminoglycan Analogues as Potential Therapeutic Agents); Youngbae **Kim** (Franklin, Characterization of Structure-Based de novo Designed Metallopeptide and Their Interactions with DNA), Chen **Li** (Gloer, Bioactive Natural Products from Selected Freshwater Aquatic Isolates and Fungicolous Penicillium Specie), Hui **Li** (Jensen, Computational Studies of Protein pK<sub>a</sub>s and Metalloprotein Reduction Potentials), Chongsoo **Lim** (Burton, Development of New Fluorinated Synthons (E)/(Z)-1-Chloro-1,2-Difluoro-2-Iodoethenes: A Single Step of Sequentially Two Steps Stereospecific Preparation of  $\alpha,\beta$ -Difluoro Ethenyl Compounds with Symmetrical of Unsymmetrical Substituents), Amy **Preszler-Prince** (Young, Investigations into the Heterogeneous Atmospheric In-

teractions of Isolated Metal Oxide, Carbonate and Soot Aerosols), Courtney **Usher** (Grassian, Laboratory Studies of Heterogeneous Reactions of Sulfur Dioxide and Ozone on Mineral Dust and Mineral Dust Proxies), Joel **Welch** (Franklin, Structural Characterization of Chimeric EF-Hands Based on the Helix-Turn-Helix), Ling **Xu** (Eyman, Synthesis, Characterization, and Catalytic applications of Grafted Metal Oxide Submonolayers on  $\gamma$ -Al<sub>2</sub>O<sub>3</sub>), Alfred **Wooten** (Messerle, Multiple Synthetic Pathways to, Reactivity of, and Molecular Orbital Calculations on an Organoditantalum  $\mu$ -Dinitrogen Complex with Reduced N-N Bond Order).

The Department is proud of this new group of talented Chemistry practitioners and we wish them the best in their future scientific endeavors!

## Emeriti Notes

Several emeritus faculty attended a recent departmental gathering at David Wiemer's house. These included, Robert **Coffman**, Ed **Buchanan**, and Bruce **Friedrich**, who continue to enjoy their retirement years in the Iowa City area. Emily **Bennett** also attended and frequently was at the center of lively conversations! The editor also bumped into another emeritus professor, Don **Pietrzyk**, at a recent UI Opera event. He and his wife continue their active retirement life, which included a recent theater blitz around London.



Is emeritus Prof. Buchanan passing on sage advice or debating foreign beer with Asst. Prof. Kohen?

with one experiment stating that each student got a quarter of a pig's stomach for enzyme experiments (very appropriate for an Iowa lab experiment!). Her interest in biochemistry continued with an M.A. in biochemistry from Boston University and later a Ph.D. in Biochemistry from the Medical College of Virginia. Her connection with biochemistry is an ongoing thread in her life, since she manages to take college level biochemistry courses every 20 years. White finds that these "refresher" courses give her a nice perspective on this rapidly evolving discipline. Her latest adventure is a move from Richmond, Virginia to Corvallis, Oregon, which brings her closer to her family. True to form, she is already contemplating ways to take her fourth biochemistry course at Oregon State University. We expect that White will keep her undergraduate classmates on their toes!

David E. **Broberg** (1960s, Ph.D. in Chemistry with William Bennett). After receiving his Ph.D. at University of Iowa, Dr. Broberg embarked on a long career at 3M (Minnesota Mining and Manufacturing). He worked for their Coated Abrasives Division and recently retired in 2002 after a 35 year career at 3M. Broberg has many fond memories from his years at the University of Iowa and notes that many UI graduates from the 1960s also embarked on career paths at 3M.

Emeritus Professor Edward Buchanan informed us of the untimely death of one of his former graduate students, John B. **McCarten**, from cancer. McCarten received his Ph.D. from the University of Iowa in 1964. Prior to that he received a B.S. degree in 1958 and an M.S. degree in 1960, both from Creighton University. McCarten was an Analytical Chemistry professor at Wichita State University from 1964 to 1997 where he taught Analytical and General Chemistry courses. He had research interests in voltammetry and ion selective electrodes. One of his friends in the Wichita Chemistry Department says McCarten was fair and patient with students in his classes and loved to play golf. He was also involved with his church and was a devoted husband, father, and grandfather. He is survived by his wife Virginia and son John Paul.

**Editors note:** Next year is the 150<sup>th</sup> anniversary of our Chemistry Department. I would like to receive alumni updates from *every decade* possible! This a great way to let your former classmates know about the road you have traveled since your time at the University of Iowa. Please write to us (see back page for contact information) and make our sesquicentennial anniversary issue one to remember! I look forward to hearing from many of you. Thanks!

## Alumni News

Catherine **White** (1944, B.A. in Chemistry). During her time at Iowa, Dr. White developed a lifelong interest in biochemistry. She states that she still has her 1943 biochemistry lab manual, complete

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## Alumni Notes and Updates for 2005 Newsletter

If you would like to share a note about yourself with your fellow Iowa Chemistry Alumni, send us a message by mail (Department of Chemistry - Chemistry Newsletter, c/o Michele Gerot, University of Iowa, Iowa City, Iowa 52242-1294) or by e-mail ([chem-alumni@uiowa.edu](mailto:chem-alumni@uiowa.edu)).

Please include the following information in your note to us:

- (1) contact information (full name, address, phone number, e-mail address)
- (2) degree information (school/location, year earned, UI faculty advisor - if applicable),
- (3) Briefly describe the significant events in your life and career since leaving the University of Iowa and re-entering the "real" world.

This is a great way to reconnect with your former UI Chemistry classmates!

Reminder: 2005 is the **150<sup>th</sup> Anniversary** of UI Chemistry

### Editor's Choice Recommended Reading

***"Uncle Tungsten: Memories of a Chemical Boyhood"* by Oliver Sacks (2002).**

A WWII era autobiography of a London boy's discovery of chemical reactions (the stinkier and more explosive the better!) and his exploration of the periodic table and the chemical pioneers. A humorous and poignant adventure that is guaranteed to reignite your dormant childhood (or adult) chemical passions.