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# University of Iowa

## Department of Chemistry



Entrance to "New" UI Chemistry Building profiled in AXE *Hexagon* (ca. 1930)

Spring/Summer 2003

www.uiowa.edu/~chemdept/

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### The View From the Front Office

I've written several articles for our past Departmental Newsletters, but this is the first time that I've been asked to write one from the perspective of the DEO.... and what a grand view it is! The Department has vibrant research programs in areas as diverse as fuel cells and protein conformations; reactions in the atmosphere, in organic solids, and on catalytic surfaces; enzyme reaction mechanisms and enzyme inhibitors. This research is conducted in the midst of a massive teaching enterprise that enrolls thousands of students every semester. The graduate students, staff, and faculty of this Department carry an amazing load, and do so with finesse and good cheer.

There are so many highlights to this past year that it's difficult to know where to start. We phased in new freshman chemistry courses with an integrated lecture and laboratory approach to replace the separate lectures and lab courses taken by a generation of Iowa students. More than 1,800 students have taken the new courses already, and we anticipate that even more will enroll next year when these courses are available for the full year. The University of Iowa has requested support to renovate the northeast wing of the Chemistry Building into modern research laboratories and to convert the venerable (*i.e.*, ancient) 300 CB auditorium into new instructional labs. While the state legislature could not include this project in this year's appropriations, planning continues with internal support and we're resolved to present these needs to the legislature again next year. The strength of our program has been recognized with a host of new research grants, a substantial new award from the Department of Education to support recruitment of a more diverse graduate student body, and two faculty who

have been promoted to associate professor (Jan Jensen and Ed Gillan).

This past year has also had its times of sadness. In this issue we note the passing of our alumnus and benefactor Dr. John A. Means and long time faculty member William E. Bennett. We also retell the poignant story that our alumnus, Herbert K. Hoglan, sent us about days at Iowa, his days in the service and his career, and his only grandson, Mark Bingham. This year also marked the passing of one of our own graduate students, Yichao Gao, whose easy smile and outgoing personality is missed throughout the labs and halls of the Chemistry Building.

We're looking forward to next year, even though there will be an abundance of challenges. We expect a record high number of undergraduate students, and we have admitted a class of 31 new graduate students to help teach them. Two new faculty members (Claudio Margulis from Columbia and Chris Cheatum from MIT) will be joining us, but colleagues like Bob Linhardt and Scott Martin will be moving on. So we will continue to recruit talented new faculty members, attract new graduate students, and continue to lobby for legislative attention to our needs for modern space for teaching and research. This will have to be done against the backdrop of a weak economy, budget cuts at the UI, and increasing enrollments. With the continued dedication of the folks 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

### Iowa Undergraduate Chemistry

There were **81** declared undergraduate chemistry majors in fall 2002 and **18** students received bachelors degrees during the 2002 - 2003 year.

Several undergraduates presented their research at the spring 2003 Undergraduate Poster Session. At this time, the **Chemistry Alumni Awards** were announced. This year's recipients were Jonathan **Gourley** (sophomore), Erik **Alexander** (junior), and Rachel **Hoftzyer** (senior).

Other student awardees include: Adam **Christensen** (Ken Sando Undergraduate Scholarship) Julie **Corr** (American Institute of Chemists Award) Adam **Mattox** (Russell K. Simms Scholarship) Cianan **Russell** (Analytical Chemistry Award) Jennifer **Wade** (Merck Index Award) Gillian **Woodburn** (CRC Press Freshman Chemistry Award)

## Burton Recognized with ACS Service Awards

The Department proudly announces that Professor Donald **Burton** has received several recent awards from the American Chemical Society. In January 2003, he received the ACS Fluorine Division's *Distinguished Service Award* at the ACS



Donald Burton

Winter Fluorine Conference in St. Petersburg Beach. In August 2002, he also received an award for recognition of 20 years of service to the ACS Council.

Don Burton's academic career at Iowa spans 41 years and has resulted in approximately 290 publications, with nine papers in the past year alone. He has also trained 60 Ph.D. students and 20 post-docs. One of his 1969 Ph.D. graduates, Professor Kenneth Klabunde (Chemistry, Kansas State University), has been named as one of this year's University Alumni Fellows (see next story). Don's current research interests involve the develop-

ment of new synthetic reagents to selectively introduce fluorine into compounds. His group frequently utilizes reactive organometallic fluorocarbon reagents and investigates reaction mechanisms relating to selective fluorination.

In 1989, Don was awarded a chaired position, the Ralph Shriners/Carver Professorship. By some inexplicable bureaucratic mystique, Don finally received the Medallion associated with this award in April 2003 at the College of Liberal Arts and Sciences Honor Reception. We want to congratulate Don for his patience over the past 14 years!

## Ph.D. Alumnus is Honored as University Alumni Fellow

We were delighted to report that Professor Kenneth J. **Klabunde** has been selected as a University of Iowa Alumni Fellow for 2003. Ken received his Ph.D. in 1969 under the direction of Professor Donald **Burton**. Several years ago, the College of Liberal Arts and Sciences established the "Alumni Fellows" program to honor distinguished alumni and bring them to campus to interact with faculty and students.

Ken Klabunde's research interests span a range of areas including metal atom synthesis in hydrocarbon solvents, nanoscale metal oxide synthesis, and the use of nanoscale materials in the catalytic degradation of environmental contaminants and chemical warfare agents.

Ken will be on campus on September 11 and 12, 2003 to receive this award. As part of his visit, he will speak to classes in

the Department, meet socially with small groups of faculty and students, and give a public lecture on his experiences since leaving the University. We look forward to visiting with Ken, hearing what he is doing, and showing him how the Department has changed in the last 34 years. If you are in the area during these dates, drop by and join us in greeting Ken with a big Iowa welcome!

## Linhardt Receives ACS Carbohydrate Award and Takes on New Challenges

The Department is pleased to announce that Professor Robert **Linhardt** is the recipient of the *2003 Claude S. Hudson Award in Carbohydrate Chemistry* - a prestigious American Chemical Society national award. He was presented with this award at the 225<sup>th</sup> National ACS meeting in New Orleans in March. While Bob has held a partial appointment as an F. Wendell Miller Distinguished Professor of Chemistry for the past several years, his career at the University of Iowa in the Department of Medicinal and Nature Products Chemistry (College of Pharmacy) spans 21 years and has resulted in over 300 publications and 35 patents. He is world-renowned for numerous advances and discoveries in the area of carbohydrate separation and identification. His research program seeks to establish

structure-activity relationships for complex carbohydrates, which often result in these compounds becoming attractive new drug development candidates. Bob is best recognized for seminal studies on the heparin structure and function and has been referred to as "Mr. Heparin" by his peers.

With such sustained success and international recognition, Bob Linhardt has fi-



Robert Linhardt

nally succumbed to the exciting grand challenge of becoming a Senior Constellation Chair in Biocatalysis and Metabolic Engineering at Rensselaer Polytechnic Institute (RPI) in Troy, NY. Through a recent \$360 million anonymous donation, RPI is aggressively expanding its research infrastructure in key strategic focus areas. As a senior constellation chair (one of only six university-wide), Bob will take the lead in structuring the rest of the members of his constellation research cluster, which includes attracting additional high-level faculty members. Bob anticipates that his research will take on an increasing bioengineering focus at RPI. Join us in sending Bob best wishes with his new and challenging research adventures!

## Multi-Million Dollar Grants for Analytical Research Projects

A multidisciplinary research team led by Mark **Arnold**, Professor of Chemistry and Director of the University of Iowa Optical Science and Technology Center (OSTC), has received a four-year, \$2.56 million grant from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) to develop a novel blood glucose sensor for the management of diabetes. The team is comprised of researchers from Physics, Engineering, and Medicine and collaborators at Ohio University and the University of Kansas. This grant supports the basic science studies and construction of a device that

utilizes near infrared light to monitor blood glucose levels in interstitial fluid collected with an ultra-filtration probe located subcutaneously. The Arnold group's research on non-invasive glucose sensing has received significant notice in the scientific and popular press, with an article in *C&E News* in Sept. 2002 and articles in the *New York Times* and *Houston Chronicle* in late 1999. Other high profile research from the Arnold group includes the design of chemical oxygen sensors for cell cultures for an experiment that flew on the Space Shuttle Columbia in summer of 1999.



Geng and Arnold outside the IATL

Lei **Geng**, Associate Professor of Chemistry, has been awarded a five-year, \$1.15 million grant from the National Cancer Institute, which is a component of the National Institutes of Health (NIH). This new research funding provides the Geng research group with the resources to develop spectrally-resolved fluorescence correlation spectroscopy for high-contrast biomedical imaging. While conventional fluorescence imaging is widely used in

biomedical research, it suffers from low information content and lack of chemical specificity. The Geng group's approach will enhance conventional fluorescence techniques with physiochemical spectroscopic information and provide a more comprehensive analysis of biomedical samples. The new imaging technique will be developed for noninvasive cancer diagnosis. Various normal and cancerous tissue samples will be investigated. The enhanced information content will lead to higher contrast between normal and cancerous tissue, providing a promising method for early diagnosis of cancers.

The Geng group will soon move into new laboratories in the Iowa Advanced Technology Laboratory (IATL), whose occupants include the Arnold group and others from chemistry, physics, and engineering.

**Mark Arnold and Dave Wiemer were each awarded prestigious 2003 Regents Awards for Faculty Excellence**

## Emeritus Chemistry Professors Get a New Home

Our Emeritus Professors are part of our history and heritage; we have learned from them and cherish our long standing interactions with them. Many of us have wished that our Emeriti had a physical place in the Department that they could use and call their own. One of the first tasks that Dave Wiemer undertook when he became DEO was to find that elusive 'home' for our Emeriti. On November 5, the Emeriti Office was inaugurated (see party photos below and at right). The room contains desks, filing cabinets and a

computer where they can work, email, talk, etc. Outside of the room is a list of inaugural occupants: Norman C. Baenziger, William E. Bennett, E. B. Buchanan, Jr, E. David Cater, Robert E. Coffman, John R. Doyle, H. Bruce Friedrich and Donald J. Pietrzyk. Of the eight, only Norman and Dave Cater were unable to attend the grand opening. It is nice to see the room being used; Dave Wiemer is to be congratulated for his successful efforts. Can you identify the six Emeriti in the picture on the right?



Wiemer and Buchanan



(left to right) Coffman, Bennett, Friedrich, Pietrzyk, Doyle, Buchanan

**Last year, generous donations to the Department of Chemistry helped support over 30 graduate students who presented their research at scientific meetings, including ACS, Electrochemical Society, Analytical and Vacuum Society national meetings, and various regional scientific events.**

## Chemistry Graduate Students Receive Awards and Recognition

Drew **Dunwoody** and Wayne **Gellett** (Leddy group), were recently named as one of 16 finalists in the Collegiate Inventors Competition, sponsored by the National Inventors Hall of Fame, in New York City. These chemists were recognized for their work on a hydrogen fuel cell that is modified with magnetic particles. The magnetic particles produce more efficient and powerful fuel cells that could make the technology a more commercially viable form of power generation. The Chemistry team is the first from UI to be named finalists in the Collegiate Inventors Competition. More than 200 entries were solicited from 900 U.S. colleges and universities, from which 16 were named as finalists.



Molina, Gellett, Dunwoody

Two graduate students, Stephen **Deyrup** (Gloer group) and Pablo **Molina** (Jensen group), received Outstanding Teaching Assistant Awards for 2002-03 from the University of Iowa. These awards recognize their exceptional dedication to undergraduate teaching and outstanding service to the university. Only 25 of these awards are given out in 2003. Pablo will test out his teaching skills in fall 2003 as an assistant professor at Murray State University in Kentucky.

Chongsoo **Lim** (Burton group) received an award for the most outstanding poster at the 16<sup>th</sup> ACS Winter Fluorine Conference in St. Petersburg Beach, Florida in January 2003.



Deyrup, Krueger, Varshney, Lim

Brenda **Krueger** (Grassian group) received second place in the 2003 James F. Jakobsen Graduate Forum; Mathematical, Physical Science and Engineering section. This University of Iowa forum provides a local venue for graduate students to publicly present their research results to the University community.

Dushyant **Varshney** (MacGillivray group) was awarded a Predoctoral Fellowship from the University of Iowa Center for Biocatalysis and Bioprocessing.

Join us in congratulating these graduate students on their well-earned successes!

### By the Numbers: Teaching and Research in the Department of Chemistry — 2003

<b>24</b>	<b>tenure/tenure-track faculty</b>
<b>5</b>	<b>visiting assistant professors</b>
<b>1</b>	<b>lecturer</b>
<b>102</b>	<b>graduate students</b>
<b>22</b>	<b>postdoctoral associates</b>
<b>5</b>	<b>research scientists</b>
<b>22</b>	<b>support staff</b>

## Graduate Degrees Awarded in 2002-2003

There were 101 graduate students in our department in 2002 - 2003. There were 9 M.S. degrees awarded (advisor's name in parentheses): Jon **Arnold** (Burton), Yixian **Chen** (Linhardt), Conrad **Jones** (Larsen), Prem **Kanthan** (Leddy), Jocelyn **McCracken** (Kohen), Malia **Moore** (Kohen), Elisha **Pendleton** (Franklin), Abdulmajeed **Shuwaimi** (Grassian), and Pengcheng **Zou** (Leddy).

There were 9 Ph.D. degrees awarded in Chemistry over the past year. These new Chemistry Ph.D.s (advisor name and dissertation title noted in parentheses) are:

Xuemei **Chen** (Wiemer: Synthesis of Cytosine Arabinoside Mono- and Diphosphate Analogs), Sven **Guenther** (Nair: Molecular Design and Synthesis of Potential Antiviral Isonucleosides), Dan **Hay** (Messerle: Unconventional Mild Reductants In Solid State Chemistry: Synthesis of Group 5 and 6 Hexanuclear and Trinuclear Cluster Halides), Mee Kyoung **Kim** (Wiemer: Fluorescent Probes for Protein Prenylation and Tripeptidyl Probes for Tripeptidyl Protease I), Jeff **Luci** (Messerle: Synthetic Studies and Molecular Orbital Calculations in Early Transition Metal Organodimetallic and Trinuclear

Cluster Chemistries), Pablo **Molina** (Jensen: A Computational Characterization of Hydrogen Bonding in Serine Proteases), Julie **Reece-Seeba** (Arnold: Optical Sensors for Oxygen and Carbon Dioxide with Radioluminescent Light Sources and Application to Bioprocess Monitoring), Alexander **Saladino** (Larsen: Density Functional Theory Calculations of the EPR Parameters for Transition Metal Complexes), Jennifer **Winkenwerder** (Arnold: Cell-to-Cell Adhesion and Migration Studies of Insect Cells Using Laser Tweezers and the Evaluation of Mammalian Cell Cultivations in Rotating Wall Vessels).

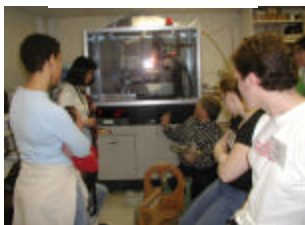
## Working Weekends Showcase Modern Iowa Chemistry

In the 2002 newsletter, we introduced you to our newest graduate student recruiting and regional outreach program - Working Weekends at Iowa (WW@IA). We bring local college professors and their advanced undergraduate students to the University of Iowa for an intensive two-day hands-on introduction to chemical analysis and synthesis. The fall 2002 working weekend was organized by Len **MacGillivray** and focused on computational chemistry and X-ray crystallography (powder and single crystal). The recent spring event was organized by Lei **Geng** and covered a broad microscopy theme, including confocal, fluorescence, scanning tunneling, and electron-based microscopies. The attendees either analyzed their own research samples or ones from

research groups in the Department. The weekend activities included in-depth technical seminars by knowledgeable faculty, hands-on experimentation (see photos), a social gathering at the AXE house, and tours of Iowa City. The hard work of Chem Center staff (**Michele Gerot** and **Janet McCune**) along with many faculty and graduate students continues to ensure

that these events are successful. Several student attendees recently chose to pursue Chemistry Ph.D. degrees at Iowa, so the WW@IA experience seems to be a positive one! The current plans for 2003-04 working weekends include one on magnetic resonance and mass spectrometry, and another one on surfaces and catalysis.

X-ray diffraction



Computation

Auger spectroscopy



## Physical Chemistry Experiences Rapid Growth

Our successful 2002 new faculty searches resulted in the hiring of two Physical Chemistry Assistant Professors for fall 2003. With these new additions, the Physical Chemistry division will rapidly grow by 50%.

Dr. Chris **Cheatum** is currently a postdoctoral associate in the Chemistry Department at the Massachusetts Institute of Technology (MIT). He received a B.S. degree in Chemistry at the University of New Mexico in 1995 and a Ph.D. in Chemistry from the University of Wisconsin at Madison in 2001. He has received several awards including the

Procter and Gamble Fellowship (1999), the Celanese Award for Outstanding Graduate Research (1999), a National Parkinson Foundation Postdoctoral Fellowship (2001) and the National Parkinson Foundation Hekkila Research Scholar Award (2001). Dr. Cheatum's research interests are in the area of proton transfer and time-resolved vibrational spectroscopy. He plans to study proton transfer in small molecules and in proteins using 2-dimensional infrared spectroscopy.

Dr. Claudio **Margulis** is currently a postdoctoral associate at Columbia

University. He received his undergraduate degree from the University of Buenos Aires in Argentina in 1996 and his Ph.D. in Chemistry from Boston University in 2001. Dr. Margulis received the Sugata Ray Award in 1998-99 for outstanding research accomplishments and teaching contributions at Boston University. His research interests are in the area of theoretical and computational chemistry. He plans to study excited state dynamics and thermodynamics in the condensed phase by investigating biological and ionic solvent systems.

## Young Faculty Climb the Tenure Ladder

Ed **Gillan** and Jan **Jensen** passed through the final hurdles of the university tenure process and earned promotion and tenure to the Associate Professor level, effective July 2003. Both professors joined the Department faculty in fall 1997.

Ed Gillan's inorganic materials chemistry research program is focused on discovering energetic precursors that have utility in the synthesis of inorganic solid-state

materials with unusual compositions or structures.

Jan Jensen's computational chemistry research program explores the area of computational biophysics at the intersection of molecular physics, quantum chemistry, and structural biology. This research combines theory and algorithm development with computational modeling of protein chemistry.



Gillan and Jensen

## Creative Strategies and Devoted People Drive Undergraduate Teaching

### “Principles of Chemistry” Redesign Implemented

Every so often, even an ‘institution’ like general chemistry needs a “mid-life crisis” and the opportunity to be reinvented. The “Principles of Chemistry” sequence (4:013, 4:014, and 4:016), which has served thousands of students since the mid-1970s, is now part of the department’s rich history. The three courses have been replaced by a two course sequence (4:011 and 4:012) in which a laboratory experience is once again an integral part of each course.

Part of the redesign was funded by a grant from the Pew Program in Course Redesign, which provided resources to create the unique material for the case-study sessions and experiments for the laboratory portion. The case-study sessions involve an introduction to concepts, techniques, and safety conducted in an interactive format under the able tutelage of Dr. Mohamed **El-Maazawi** (see next story). The materials design team involved Dr. Lynne **Cannon** (retired from the Director of Laboratories position), Dr. Russell **Lar-**

**sen** (current Director of Labs), Profs. Sonya **Franklin**, Ed **Gillan**, Dwight **Tardy**, Jason **Telford**, and in addition to the individuals mentioned above. Writing a manual by committee is just about what you would expect it to be!

As part of his reward for spearheading the course transition over the last several years, Prof. Norb **Pienta** taught both inaugural sections of Chemistry 4:011, which premiered in fall 2002. The new course is comprised of lecture, discussion, case-study, and laboratory sessions. As could be anticipated, a certain fraction of the *ca.* 820 enrolled students struggled to keep track of where and when they needed to be somewhere. In spring 2003, Prof. Darrell **Eyman** and Dr. Peter **Hansen** took over the helm in 4:011 and Prof. Harold **Goff** and Dr. Joe **Christopher** taught 4:012.

The students seem to have taken the changes in stride. Their reports and those from colleagues and administrators have been positive and supportive. Norb **Pienta** reported that it took over 1500 emails in the fall to address students’

questions about course content and infrastructure, electronic homework, tests, and the usual variety of issues. We are happy to report that student withdrawals from the courses are at record lows (below 5%) and performance assessments (e.g., ACS standardized exams and the Iowa Chemistry Diagnostic Exam) show that they are performing at or above expectations. At a recent meeting with the Director of Undergraduate Studies and an associate dean of the college, DEO Dave **Wiemer** stated that “...we have a few more courses to work on in the next few years...”. We’ll tell you all about that in future newsletters.

**Each year, Chemistry Department faculty teach over 5600 undergraduate students, with nearly 4300 of those in General Chemistry courses alone!**

### A New Case Study Guru

Mohamed **El-Maazawi** joined us this last fall as a Visiting Professor teaching the Principles of Chemistry Laboratory and the case study/lab combination in the newly integrated Principles of Chemistry sequence. This spring, he was hired in the newly created ‘Lecturer’ position where he continues to deliver the case studies and oversee labs for the new courses. Previous to his teaching position in our Department, he conducted research with Professors Vicki **Grassian**

(Department of Chemistry) and Alec **Scranton** (Department of Chemical and Biochemical Engineering). Mohamed was raised in Alexandria, Egypt and received his B.Sc. in Chemistry from the University of Alexandria. After receiving his Ph.D. in 1992 from Penn State University, he taught a variety of courses at Alma College in Michigan and at the United Arab Emirates University. His teaching experience in different environments coupled with his willingness to go that ‘extra’ mile has added a new dimen-

sion to our revamped undergraduate general chemistry program.

It is not clear where Mohamed finds time to spend with his wife and four children, but he does. Activities include playing soccer, basketball, or swimming. The family continues to enjoy traveling and the memories of every place they have visited or lived in. We feel fortunate to have Mohamed in the Department and look forward to working with him on future curriculum developments.

### Thermal Analysis Equipment Heats up Undergrad Labs

Dwight **Tardy**’s Instructional Equipment Request for a Differential Scanning Calorimeter (DSC) and Thermogravimetric

Analysis (TGA) Instruments from the college was approved. Russell **Larsen** and Dwight were able to leverage this funding and received a tremendous quotation from TA Instruments for state-of-the-art equipment, which should be up and running by

the time you receive this newsletter. The DSC and TGA will expose our undergraduate chemistry majors to thermal techniques frequently used in industry. We are excited since these instruments fill a hole that we had in the list of ACS rec-

ommended equipment. New experiments are being designed for the Basic Measurements course and will be implemented this Fall. The new TA Instruments have auto samplers and are connected to our internet network so students can access and analyze their data anywhere! The automation will allow us to quickly process many samples without 'human' intervention. An immediate application, possibly this summer, will be to conduct purity tests on student samples in the Organic Laboratory.

### Pocket Computers and Chemistry

Professors **Pienta** and **Tardy** received funds from the college's Instructional Technology Committee to use handheld computers to 'Transform Lecture Auditoria and Laboratories into Interactive Learning Environments'. The students will use the wireless computers to interact with the instructor or other students during organized class activities. Initially the system will be used in the majors Basic Measurements course. We expect such a device to become an indispensable means of communication, information documen-

tation, and data collection. The use of this hardware and specific software to run on it would be required 'tools' and will provide a path to 'vertically' integrate some of the courses in the major. When our majors graduate they will have a knowledge base in their pocket which they can share with others. The impact on learning in the larger 'gen chem' course is also very significant. Applications include: visualization of molecules, survey or self-assessment with immediate feedback to instructor, interactive class notes, multimedia activities, spread sheet and graphing tools.

## Hazel Kerr Manages Staff, Faculty, and Finances with Finesse

Faculty, graduate students, visiting scientists, and support staff all work toward our common goals of advancing research science and chemical education. A key player on the staff team is Hazel **Kerr**, who has been the Chemistry Department's Administrative Associate for the past 11 years. She was born in Dublin, Ireland and moved to Dyersville, Iowa as a teenager. After receiving a Bachelor's degree in Business Administration from the University of Iowa, she worked in several university departments before coming to the Chemistry Department in 1992. Hazel oversees and monitors most major aspects of the Department's daily functions. These include supervising

other staff members, monitoring all department and faculty spending, assisting with hiring processes, and overseeing all aspects of laboratory renovations. With a constant influx of new faculty (8 in the past 6 years!), Hazel is constantly advising new professors on the nuances of grant management and university policies. Hazel's daily emails may range from notices of water leaks to requests for input on the upcoming multi-million dollar Chemistry renovation project. She also provides crucial historical information and accounting details to new Departmental Executive Officers, who change every few years. Over the past decade, she has served on numerous uni-

versity search and planning committees and is a currently a member of the Staff Council Executive Committee. In 2001, Hazel was recognized for her tireless efforts in Chemistry with a University Staff Excellence Award.



## Postdoctoral Associates and Visiting Scientists From Around the Globe

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 scholars working in our department as of spring 2003 are listed below (research director, Ph.D. institution and degree year are listed in parentheses): Airat **Amerov** (Arnold, Kiev State University, Ukraine, 1990); Anil Kumar **Pillai** (Burton, Indian Institute of Science, Bangalore, 2000); Yi **Wang** (Burton, Shanghai Institute of Organic Chemistry, 2002); Chandra **Ratnasamy** (Eyman,

University of Pune, India, 1998); Madhusudhana **Reddy** (Arnold, Indian Institute of Technology, Bombay, 1992); Tim **Kovacic** (Franklin, Oregon State University, 1976); Amy **Michel** (Grassian, University of Colorado, 2001); Mor **Naor** (Jensen, Hebrew University of Jerusalem 2001); Abdillahi **Bouh** (Kohen, University of Ottawa, 2001); Cornelia **Mihai** (Kohen, University of Illinois, Chicago, 2001); R. Steve **Sikorski** (Kohen, University of Iowa, 2000); Amandeep **Sra** (Kohen, University of Mumbai, 2000); Weiguo Song (Larsen, University of Southern California, 2001); Nathalie

**Karst** (Linhardt, University of New Orleans, 2001); Sultan **Baytas** (Linhardt, Gazi University, Turkey, 2002); Ioannis **Papaefstathiou** (MacGillivray, University of Patras, Greece 2002) who was awarded a University of Iowa Biosciences Initiative Postdoctoral Fellowship to support his research efforts; Thirumalai **Duraisamy** (Messerle, Indian Institute of Technology, New Delhi, 2000); Yurngdong **Jahng** (Telford, University of Houston, 1986); Dragos **Albinescu** (Wiemer, University of Illinois, Chicago, 2001); Donald **Zehnder** (Wiemer, University of Cincinnati, 2002).

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## Good News and Updates From the Faculty

Don **Burton** presented invited papers in the Neil Bartlett Symposium at the Boston ACS Meeting in August 2002, at the H.C. Brown Symposium at Purdue University in May 2002, and at the 16th ACS Winter Fluorine Conference in St. Petersburg Beach, Florida in January 2003.

Ed **Gillan** presented invited seminars at the NSF Materials Chemistry Workshop and Northwestern University in fall 2002. He also published five research articles in 2002, including several in ACS and Royal Chemical Soc. journals.

Vicki **Grassian** has been elected to the National Council of Iota Sigma Pi, a national honor society for women in chemistry. The society also elected her to the post of national director of student awards. Grassian says that she is "excited about this opportunity to recog-

nize outstanding young women chemists through Iota Sigma Pi's student awards program." She is also serving on the American Chemical Society, Division of Colloids and Surface Chemistry Student Awards Committee. Grassian has been invited to speak this year at Harvard University and will be a Plenary Lecturer at a special meeting at Kansas State University entitled "Nanomaterials and Homeland Security". She is also a member of the International Advisory Committee for the Third San Luis Symposium on Surfaces, Interfaces and Catalysis, taking place in Mérida, Venezuela in 2004.

Jan **Jensen** was an invited speaker at the Workshop on Computer Modeling of Chemical and Biological Systems in Porto, Portugal in May 2003. He was one of five young U.S. chemists nominated by the National Science Foundation Chemistry Division to participate in the Porto

conference, which is the gateway for higher-level initiatives in the chemical sciences between Europe and the U.S. He is also an invited speaker at the prestigious International Isotope Effects Conference in Uppsala, Sweden in June 2003.

Len **MacGillivray** received a Honda Initiation Grant for the "Chemical Storage of Hydrogen within Crystalline Metal-Organic Solids". He hosted the 13<sup>th</sup> Midwest Organic Solid State Chemistry Symposium at the University of Iowa and gave several invited seminars at places including the Scripps Research Institute, UCLA, SUNY-Buffalo, and at the Southeast Regional ACS Meeting. He also accepted appointments as a Topics Editor of the ACS journal "Crystal Growth and Design" and as a member of the International Advisory Board of the Royal Society of Chemistry journal "Crystal Engineering Communications".

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## Emeriti and Alumni News

### Emeriti

Dave **Cater** has made the big move. Dave came to Iowa City in 1961 as an Assistant Professor, climbed the ranks and became an Emeritus Professor in 1996. This spring, he and Jean decided they had too many houses and decided to sell their Iowa City home, since the market here, as Dave describes it, is perennially hot. It is no wonder after four decades of accumulation that they 'underestimated' the time it takes to move. They accomplished the 'move' by making a 24 hour day last 26 hours and they are still alive! Although they have formally moved, Dave continues to consult for ACT in Iowa City and visit the Department. Our advice to Dave: When you sell your next home be conservative on how long it takes and try not to accumulate.

### Alumni

Elizabeth **Bryant** (B.A. 2000 Chemistry, B.S. 2000 Environmental Science) writes that after leaving Iowa, she went to the University of Pittsburgh to pursue a masters degree in Geology and earned a M.S. degree in 2002. She is now on her way to

the New Mexico Institute of Mining and Technology in Socorro, NM to pursue her Ph.D. in hydrology.

Adam **Capitano** (B.S. 1994) just completed a postdoctoral position at MIT with Professor Linda Griffiths and is now starting a faculty position at the University of Houston in the Department of Chemical Engineering. Adam was an honors student in the Grassian research laboratory.

Herbert K. **Hoglan** (B.S. 1936, advisor: Edward Bartow) wrote the following: "After graduating from the University of Iowa with a Phi Beta Kappa and Magna Cum Laude in 1936, I was hired by the Dow Chemical Company of Midland, Michigan. I was their Midwest sales representative until the attack on Pearl Harbor in 1941.

Then, after having taken the four year advanced course in ROTC at Iowa, I was immediately called to the colors and participated in the first allied offensive of World War II, namely "Operation Torch." I participated in the original landing at Oran, Algeria at 1:30 a.m. on November 8, 1942, and later I was an officer in the

Big Red One (First Infantry Division). Afterwards, I participated in several major engagements under General Patton. I visited Europe recently and ran into my old superior officer's grave. George Patton rests in a beautiful spot, the U.S. Veteran's Cemetery in Luxembourg. He survived World War II all right, but was cut down by a freak auto accident in Bavaria (South Germany) in 1945.

Later, I acted as an operational liaison officer between General Eisenhower's headquarters (S.H.A.E.F.) and British General Anderson's. After the battle of Kasserine Pass, I, along with two other officers, brought 1,500 German prisoners back to the U.S. on the transport George S. Goethals. Back in the U.S., I was sent to Camp Croft, South Carolina to help train raw recruits for the events yet to come.

After the war, I resumed my academic efforts and earned my Masters Degree in Professional Education from the University of Miami in 1972. After earning the latter degree, I engaged in teaching both chemistry and mathematics at Citrus College in Azusa, California, as well as at Miami Senior High School in Miami, Florida.



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As the joke "at the front" goes: "You'll have lots of experiences to tell your grandchildren." Unfortunately, until very recently, I only had one grandchild. His life was cut short by the terrorist attacks on our country on September 11, 2001. After a valiant effort by my grandson and the other passengers to fight back against

the terrorists, the plane crashed in Shanksville, Pennsylvania, killing all aboard. Later it was discovered that this particular flight, the fourth and last plane hijacked that fateful morning, was undoubtedly headed for the White House. Subsequently, President Bush and Senator John McCain pronounced all passen-

gers and crew aboard as heroes, since they saved many lives on the ground in Washington, D.C. My grandson's name was Mark Bingham and his mother's name (my daughter) is Alice Hogle. Alice is a flight attendant with United Airlines, based in San Francisco, California."

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## Chemistry Remembrances

As this newsletter went to press, we sadly learned of the death of one of our active emeriti faculty. William E. **Bennett**, 79, died on June 4, 2003 due to complications from cancer. He grew up in Kansas and attended Sterling College in Sterling, Kansas. World War II interrupted his studies and Bill enlisted the Army, serving as a medical technician with the 43<sup>rd</sup> Tank Battalion in Central Europe. After the war, he returned to Sterling College and finished his B.S. in Chemistry. He went on to earn his Ph.D. in Inorganic Chemistry from the University of Kansas in 1951, followed by a short stint as a research associate at the University of Chicago's Institute of Nuclear Studies. It was here that he met and later married his wife, Emily. Bill then moved to the Massachusetts Institute of Technology to serve as a research associate from 1952 - 1953, before accepting an appointment as an Assistant Professor of Inorganic Chemistry at the University of Iowa in 1953. His career at UI spanned 41 years and he supervised 14 graduate students during their research studies. In addition to his various teaching duties, Bill designed pioneering computer programs for his research and teaching efforts in the days when computation power was in its infancy. One of his programs was used for many years at UI and utilized pattern recognition analysis to compare multiple-choice answers from a large group of students. This program was very successful at discovering cheating students who copied their answers from others. After his retirement in 1994, Bill remained active with traveling, writing computer programs, playing bridge, doing genealogical research, volunteering at the Iowa City Public Library and Senior Center, and visiting with friends. His family and friends remember him as a kind and considerate person, who was always suppor-

tive of his friends and students. He is survived by his wife of nearly 51 years, Emily, and son, Dr. Scott Bennett. As a military veteran, Bill was honored with a '21 gun salute' at the burial. Our thoughts are with Emily and Scott. We will miss Bill and not forget his contributions to the Department.

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We are sad to report the recent death of Henry C. **Krutzsch** (Ph.D. 1968, advisor: Donald Burton) from the late effects of a stroke. He completed a rapid 3½-year Ph.D. in Organic Chemistry with a straight A average under the direction of Don Burton. He then worked in the DuPont Company's Pioneering Research Division (Wilmington, DE) and conducted research on fiber forming polymers, including contributions to Kevlar technology.

However, Henry had a desire to use his knowledge of organic polymer chemistry in the areas of biopolymers - proteins and peptides, which led to a move to the National Institutes of Health (NIH). He worked as a research biochemist at the NIH in Bethesda, Maryland from 1973 - 2003, specializing in protein and peptide chemistry. He developed novel methods for sequencing proteins with mass spectroscopy and worked on numerous projects to elucidate the amino acid structure of proteins of biological interest, including enzymes, antibodies, blood clotting factors, viral entry factors, chemotactic factors, neuroactive proteins, and gene regulation elements.

During the past 15 years, Dr. Krutzsch focused on proteins and peptides involved in cancer metastasis. He was particularly adept at pinpointing the active sites of proteins, which often involved zeroing in on only a handful of amino acids among hundreds to thousands of potential sequences. He discovered a novel peptide

inhibitor of type IV collagenase and defined the sequences that act to block this enzyme from breaking down membrane collagen, which is one mechanism whereby cancer cells invade normal cells. He identified numerous active sites involved in thrombospondin activities, including angiogenesis, cell adhesion, cell spreading and proliferation, and heparin-mediated processes, all of which are involved in metastasis. He also helped to purify and characterize autocrine motility factor, which is used by certain cancer cells to help them chemotactically move away from a primary tumor site and metastasize to distant sites. While at the NIH, Henry co-authored over 112 scientific papers, including five book chapters, and he was a co-inventor on 14 patents for biologically active peptides.

Henry had a wonderful sense of humor and was very dedicated to his work. He loved working on old cars and had a 1968 Camaro that he drove to work each day and restored to mint condition. Henry also loved gardening, going to the beach, and playing a 12-string guitar. He is survived by his wife of 29 years, Christine Krutzsch.

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We also sadly report the death of another Iowa Chemistry alumnus (as communicated by his son, John Lamb): Dr. Vernon A. **Lamb** (Ph.D. 1937, M.S. 1935, B.A. 1933) passed away on April 27, 2003, at the age of 93. His professional career included several years as a chemistry instructor (1934-37: State University of Iowa; 1937: Wisconsin Teachers College, Plattville; 1937-41: University of Maryland) followed by a long career at the National Bureau of Standards in Washington D.C. He worked at the NBS as a chemist (1941-69) and later was assistant chief of electrolysis and metal deposition (1951-69). He was a member

of the ACS, Electrochemical Society, Electroplaters Society, Electrodepositors Tech. Soc. (London), Sigma Xi, and Phi Beta Kappa. He authored or co-authored over 40 research papers and other publications, and earned several patents and numerous awards during his career. He is survived by his wife Leone and four sons.

In last year's newsletter, we announced a major gift to the department by a chemistry alumnus, Dr. John Means (Ph.D. 1941 with Prof. Waldbauer). We now somberly report that John Means passed away

in January 2003. His generous \$100,000 bequest to the department will help ensure that students passing through the Iowa Chemistry program have access to state-of-the-art scientific instrumentation. This will ensure that they are properly prepared for the modern world of industrial science.

John Means had a long and successful 34-year career as an analytical chemist at Pfizer's major plants in Brooklyn, New York and later in Vigo, Indiana. He worked on the production of penicillin during WWII and was involved in the

crystal structure determination of tetracycline. He also worked as an assistant manager of quality control and manager of laboratory operations at Pfizer, before retiring in 1975. John Means was an active member of the Wabash Valley Section of the ACS and was involved in his church and community. He and his wife Ivabell (Susie) delivered Meals on Wheels for more than 25 years. During their time at Iowa, they often canoed on the river together. John Means is survived by his son, J. Jeffrey Means, and daughter, Margaret Ann Mendleson.

For more information about private support for the Department of Chemistry, contact the UI Foundation at the address or phone number listed below.

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Michael K. Kingan  
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Iowa City, Iowa 52244-4550  
(319) 335-3305 or (800) 648-6973  
e-mail address: michael-kingan@uiowa.edu

### Your Continued Support is Crucial to our Department!

These are uncertain financial times for state-funded research universities. Rapidly increasing undergraduate tuition rates and decelerating state appropriations have forced many difficult financial decisions at the university, college, and departmental levels. Your financial support is **vital** for us to maintain a vibrant and growing Chemistry program. With increasing budget constraints, your contributions are very important and **they do make a difference**. Remember, what you may consider as a small contribution each year does have an **impact** over many years. For example, your generous donations can be used to fund scholarships and awards for outstanding graduate student research and teaching, to aid in ongoing departmental infrastructure modernization, and to supplement travel for graduate and undergraduate students who present their research results at regional and national professional scientific meetings. Attendance at national meetings not only exposes our students to state-of-the-art research, but it exposes the scientific community to the continuing research successes occurring at the University of Iowa. We want to retain our current faculty and continue to attract the best and brightest new faculty and students. Please **help us** in this endeavor!

### Notes from the Editors

This is Dwight Tardy's final run as co-editor of our annual newsletter. We all appreciate the creative energy he has devoted to this endeavor year in and year out. Each year we work hard to collect news of the exciting developments and progress made in the department. We are also indebted to Michele Gerot and Janet McCune for valuable content and editorial assistance. We hope you enjoyed reading our current issue and value any suggestions you may have for desired content in future issues. Send us an email with any of your ideas (chem-alumni@uiowa.edu). Have a safe and enjoyable 2003!

Ed Gillan and Dwight Tardy

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## Alumni Notes and Updates

If you have a recent event that you want to share with your fellow Iowa Chemistry Alumni, send us a message by mail (Department of Chemistry, c/o Chemistry Newsletter, University of Iowa, Iowa City, Iowa 52242-1294) or (preferably) by e-mail (**[chem-alumni@uiowa.edu](mailto:chem-alumni@uiowa.edu)**). As a third alternative, you may submit messages using the Alumni Input form on our departmental web site (**<http://www.uiowa.edu/~chemdept/news/alumninews.html>**).

Please include the following information in your note to us:

**Name:**

**Address:**

**Phone:**

**E-mail:**

**Degrees Earned** (include year, major, and UI faculty advisor, if applicable):

Briefly describe the significant events in your life and career since leaving the University of Iowa. This is a great way to let your old classmates know what you have been doing since graduating and moving into the real world.