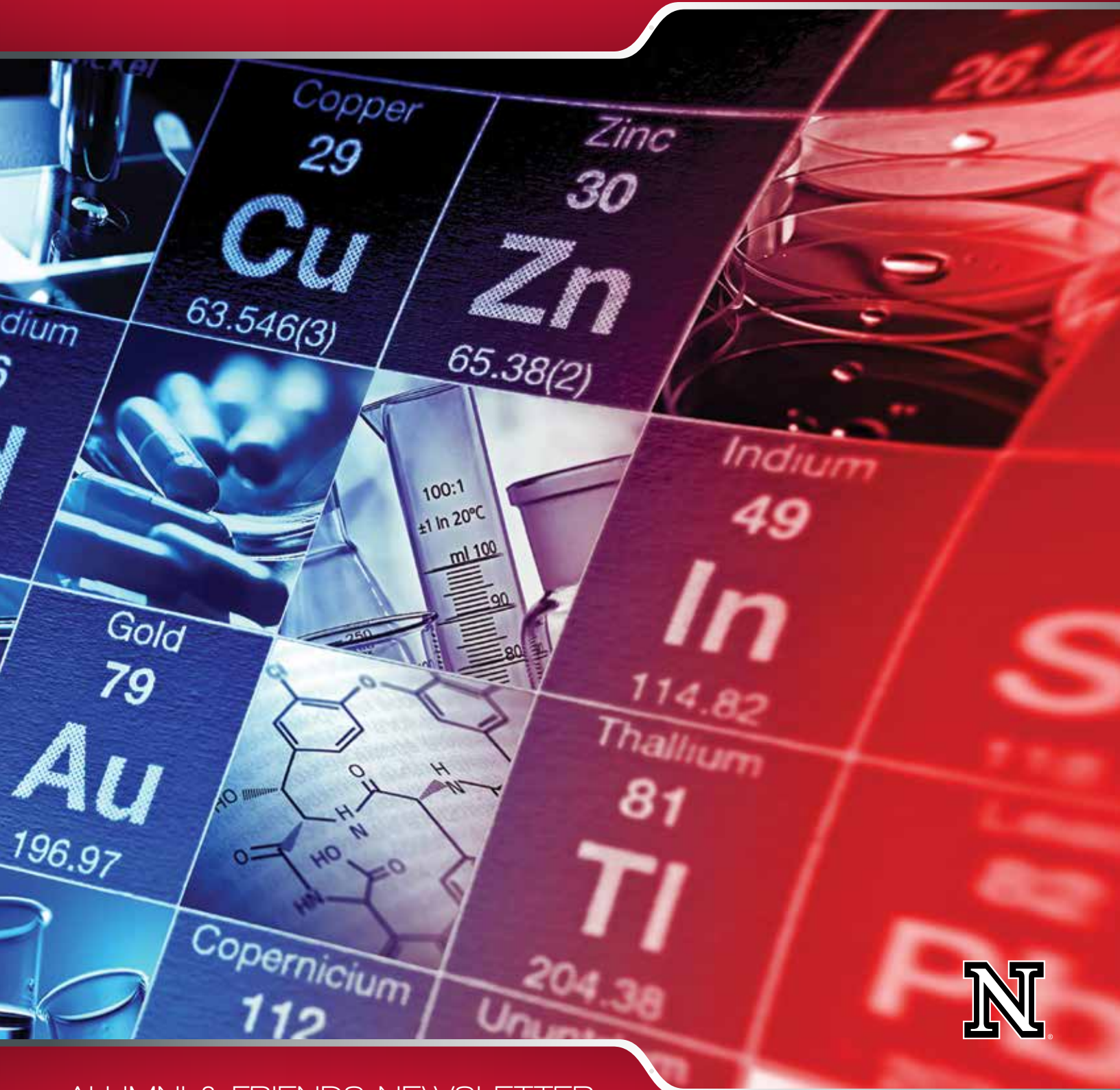


DEPARTMENT OF CHEMISTRY

UNIVERSITY OF NEBRASKA-LINCOLN



ALUMNI & FRIENDS NEWSLETTER
Summer 2014

DEPARTMENT OF CHEMISTRY

Story ideas, activities and achievements can be submitted by sending an email to kerry.vondrak@unl.edu. Receipt does not guarantee publication and the editor reserves the right to edit for space, clarity, grammar and style.

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Updates

Alumni members, now you can update your contact information by visiting http://chemweb.unl.edu/registrationforms/?wpgform_qv=alumni-registration.

Support the Chemistry Department

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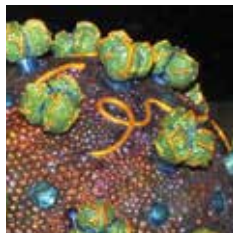
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Letter from the Chair

Fellow Nebraska Chemists,

Greetings from Lincoln! Let me begin by thanking Jim Takacs for doing an outstanding job as Chair and for adroitly passing the baton to me last August. Much has happened this past year. Our newest faculty member, Steve Morin, joined UNL Chemistry fresh out of a postdoc in Presidential Medal of Science Winner, George Whitesides' laboratory at Harvard in Fall 2013. I think that Steve set a record by recruiting four new graduate students in his first year! Steve has interests in soft robotics, microfluidics and elastomeric polymers. His group is pumped as they just moved into custom-designed space on the 4th floor of Hamilton Hall.

Elizabeth S. "Beth" Donovan arrived in January 2014 as the new Assistant Director of Instrumentation in the Department, with primary responsibility for the UIC. Beth came to us from her postdoc at Sandia National Labs. Beth works closely with Martha Morton, Director of the Research Instrumentation Facility (RIF). Big news there: The new Bruker 700 MHz liquids NMR is up and running, and according to Martha, already a favorite with the graduate students. We are working on a new magnet for the 600 MHz solids NMR and on an SEM for the UIC—more on those instruments later—stay tuned.

Joe Francisco just took the helm as Dean of the College of Arts and Sciences at UNL on July 1, 2014, arriving from Purdue. Joe will also hold a 0.2 FTE in the Department of Chemistry as the Cordes Chair. As many of you know, Joe is both an outstanding scientist, with interests in computational and atmospheric chemistry, and a leader in the community, having served as President of the ACS and of NOBCChe. Joe was recently inducted into the National Academy of Sciences, and we are tickled pink (well red, actually) to call him one of our own. With the Francisco hire, we are establishing the NC3 (Nebraska Cluster for Computational Chemistry)—more soon!!

Research successes abound in the Department: The groups of Jiantao Guo/Wei Niu; David Hage and Liangcheng Du/Pat Dussault all recently landed significant new NIH grants and Andrzej Rajca, Marjorie Langell, Marilynne Stains and Barry Cheung all recently received new grants from the NSF. Cliff Stains and Jian Zhang were funded from the Michael J. Fox Foundation and ACS PRF, respectively! Mark Griep directs a new NSF-funded outreach project to improve science education in Native American communities in Nebraska.

Honors have also been conferred upon our faculty. Xiao Zeng was named a Fellow of the RSC. Pat Dussault was awarded the College of Arts and Sciences ORCA award. Rebecca Lai has been awarded the Susan Rosowski Chair, for highly meritorious Associate Professors, and Alex Sinitskii received the Edgerton junior faculty award, and I was just elected as Chair of the Biocatalysis Gordon Research Conference.

There is so much more to discuss, but alas, you can read about some of it here and discuss the rest in person. Please come to our annual Nebraska Chemistry Alumni Gathering at the Fall 2014 ACS Meeting in San Francisco—5:15 p.m. on Tuesday, August 12, 2014, at The Thirsty Bear!—Be there or be square (planar).

Also keep a bookmark in your calendars for Spring 2016; our next Nebraska Chemistry Reunion is due to happen then; likely timed with the Spring Game. And, by the way, if you have not been back recently, you absolutely **must** head back for a visit. You will not believe the construction/development in this city; the Railyard in the West Haymarket is simply hopping—with new restaurants, hotels and entertainment at the international level (Elton John, Paul McCartney, the Eagles, Jay-Z, etc have all come through this year). And, of course, the real "rock stars" are the faculty whom we have been hiring. Hope to see you soon in Lincoln or at the Fall ACS Meeting in San Francisco!

Best wishes,



David B. Berkowitz
Willa Cather Professor & Department Chair



Chemistry Research Team Develops Chemical Solution for Graphene Challenges

There's no question that graphene is a really cool material. It's the thinnest substance ever made, a one-atom-thick sheet of carbon atoms arranged in a hexagonal honeycomb pattern. Although it's as stiff as diamond and hundreds of times stronger than steel, it's flexible and stretchable. On top of that, it conducts electricity faster at room temperature than any other known material and it can convert light of any wavelength into a current.

Finding a way to make use of those properties has proven to be an enormous challenge, however. Graphene's extreme thinness makes it complicated and expensive to produce in large sheets, especially large sheets with a minimum of flaws. In addition, no one has devised effective industrial methods for handling a material so thin.

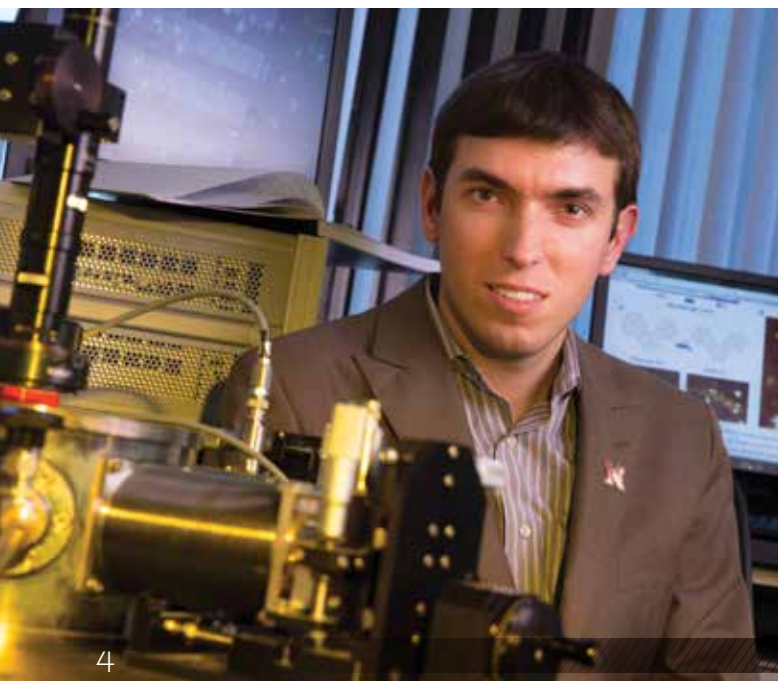
Beyond that, one of graphene's greatest strengths—its extreme conductivity—is also one of its greatest weaknesses. Once electrical current starts flowing through graphene, it's very hard to turn it on and off, a vital requirement in digital electronics. According to theoretical studies, it is possible to turn the conductivity of graphene on and off if it is constrained into a narrow channel, a graphene nanoribbon. However, the practical realization of these nanoribbons is challenging because of their extremely small size—their width is about 100,000 times smaller than the diameter of an average human hair.

Now, however, at least some of those challenges may have found an answer in recent research performed at UNL.

A team of scientists led by Alexander Sinitskii has developed a chemical approach to mass producing graphene nanoribbons, a process that may provide an avenue to harnessing graphene's conductivity.

Sinitskii, an assistant professor of chemistry with a dual appointment in UNL's Nebraska Center for Materials and Nanoscience, said previous efforts by his and other research groups at creating graphene nanoribbons followed a top-down approach, using lithography and etching process to try to cut ribbons out of graphene sheets.

Dr. Alexander Sinitskii



While those processes work well in the semiconductor industry, where silicon transistor features as small as 22 nanometers (22 billionths of a meter) are carved from large silicon crystals, they don't work with graphene nanoribbons, which need to be as narrow as 2 nanometers, Sinitskii said.

Consequently, he and his collaborators tried a different, ultimately successful approach that they described in the Feb. 10 issue of *Nature Communications*, the online multidisciplinary journal of the Nature Publishing Group.

"Instead of starting with a large sheet of graphene and trying to cut it down to something small—the essence of a top-down approach—we decided to use a bottom-up approach, making small graphene nanoribbons by coupling even smaller organic molecules," Sinitskii said.

"When you develop a method for making graphene nanoribbons, there are two problems that you need to solve: how to fabricate very narrow ribbons with atomic precision and how to fabricate them in large quantities. The method that we developed solves both these problems. The whole process is done by wet chemistry in a flask, and, it can be easily scaled up. We can make a gram, a kilogram, essentially any amount of material that's necessary."

Producing nanoscale ribbons of graphene is an essential step in putting the substance to work in all manner of electrical devices, Sinitskii said, because the ribbons have tunable electronic properties.

"We are testing these ribbons for applications in electronics, gas sensors and solar cells, often in collaboration with other UNL researchers," he said. "The fact that we could tune the electronic properties of graphene nanoribbons by changing the synthetic conditions is very beneficial for these applications. And for practical applications, it is also important that this new method of the synthesis of graphene nanoribbons could be scaled up to industrial scales."

Sinitskii's coauthors on the *Nature Communications* paper were graduate students Timothy H. Vo, Mikhail Shekhirev and Peter M. Wilson, and research associate professor Martha D. Morton of the UNL Department of Chemistry; graduate student Donna A. Kunkel, December 2012 doctoral graduate Lingmei Kong, and professors Peter Dowben and Axel Enders of the UNL Department of Physics and Astronomy; and Eric Berglund, junior chemical engineering major from Omaha. Sinitskii said Enders' lab provided imaging of the ribbons and Dowben's lab determined their spectroscopic characterization. The research was funded by the Nebraska Center for Energy Sciences Research and performed in the UNL Department of Chemistry, in association with the Nebraska Center for Materials and Nanoscience.

— Tom Simons, UNL University Communications

Grant Funds New Approach to HIV Vaccine

Using a genetically modified form of the HIV virus, a team of University of Nebraska–Lincoln scientists has developed a promising new approach that could someday lead to a more effective HIV vaccine.

The team, led by chemist Jiantao Guo, virologist Qingsheng Li and synthetic biologist Wei Niu, has successfully tested the novel approach for vaccine development in vitro and has published findings in *Angewandte Chemie-International Edition* (IF 13.7).

With the new approach, the UNL team is able to use an attenuated—or weakened—HIV virus in the vaccine. The new method involves manipulating the virus' codons—a sequence of three nucleotides that form genetic code—to rely on an unnatural amino acid for proper protein translation, which allows it to replicate. Because this amino acid is foreign to the human body, the virus cannot continue to reproduce, Guo said.

Adaptive immunity is developed when the body's immune system develops antibodies that attack the virus. The virus is then shut off from replicating by removing the amino acid.

"Since the unnatural amino acid is not present in humans, the virus cannot further replicate and cause disease once a desirable protection is achieved," Guo said.

On June 1, they will begin the next phase of development through a four-year, \$1.9 million grant from the NIH; National Institute of Allergy and Infectious Diseases. The grant will allow further research involving the genetically modified virus and lead to animal trials of the vaccine.

Since the HIV/AIDS pandemic began in the 1980s, an estimated

36 million people have died from the disease. Today, more than 35 million people live with the virus and 2.5 million new infections are recorded each year. No universal cure or vaccine exists, mainly because of the virus' persistent replication and evolution.

The most successful vaccination attempt in humans—a trial in Thailand in the middle of the last decade—had a roughly 31 percent efficacy rate. But that vaccine used engineered versions of HIV genes and proteins, rather than the actual virus.

"The science tells us a live-attenuated vaccine would work best to stop the pandemic and possibly eradicate the disease," Li said. "But, using a live virus in a human trial has safety concerns."

Using an attenuated virus in a vaccine has not been accomplished before because HIV—even a weakened form of the virus—replicates rapidly, which allows it to evolve quickly and regain its virulence and disease-causing ability.

With the funds from the grant, Guo, assistant professor of chemistry, and Li, associate professor of biology, along with Niu, research assistant professor in chemistry, will perfect the technology and begin new trials.

The early studies on this project were conducted with support from the UNL Department of Chemistry, School of Biological Sciences, Nebraska Center for Virology and Nebraska Research Initiative.

The *Angewandte Chemie* journal article is available at <http://onlinelibrary.wiley.com/doi/10.1002/anie.201402092/full>.

— Deann Gayman, UNL University Communications

Drs. Qingsheng Li (left), Wei Niu and Jiantao Guo



Startup Grown From UNL Research Wins NSF Grant

Ground Fluor Pharmaceuticals Inc., a startup company that grew from technology developed from the Stephen DiMagno's chemistry research lab, has won a \$726,000 National Science Foundation grant to expand its research and product development.

The Phase II Small Business Innovation Research grant will fund further research and production of a positron emission tomography, or PET, agent that can be used to diagnose and manage brain tumors and potentially to diagnose many other common diseases, including Parkinson's, Alzheimer's and many forms of cancer.

Ground Fluor is harnessing novel, efficient chemistry developed at UNL to produce high-purity agents used in PET scans. A common nuclear medicine imaging technique used for diagnosing and detecting certain diseases, PET relies on radiotracers to give information about the function and metabolism in the body's organs.

Through his basic research at UNL, chemistry professor Stephen DiMagno developed a technique to attach the radioactive isotope fluorine-18 to different carrier molecules. The isotope enables a PET scanner to detect a compound's metabolic fate.

In 2012, DiMagno co-founded Ground Fluor Pharmaceuticals with help from NUtech Ventures Inc., UNL's technology commercialization affiliate. Ground Fluor holds an exclusive worldwide license for the novel chemistry.

"(Ground Fluor) was formed to translate and commercialize new tools for molecular imaging and therapy. It is gratifying to see these products progress toward the market," DiMagno said. "We are very excited about the potential of our agents and technology to assist physicians in the diagnosis and treatment of serious diseases."

In addition to developing new imaging agents, the company also partners with other companies to better manufacture imaging agents for nuclear medicine. Kiel Neumann, Ground Fluor's associate director for research and development, and a UNL graduate, is leading the SBIR Phase II grant.

"The grant is another big win for Ground Fluor," said Brad Roth, executive director of NUtech Ventures. "This is a wonderful example of what happens when we get UNL's research discoveries into the hands of entrepreneurs who build innovative new companies and develop potentially life-changing products."

The company was formed after DiMagno received an NSF Innovation Corps grant in late 2011. The NSF I-Corps grants are designed to help commercialize promising NSF-funded research. In 2013, the company won a \$150,000 NSF Phase I SBIR grant, which was matched by a \$97,500 grant from the Nebraska Department of Economic Development. Ground Fluor Pharmaceuticals' research and development facility is in Lincoln. Business offices are in Lincoln and Cambridge, Mass.

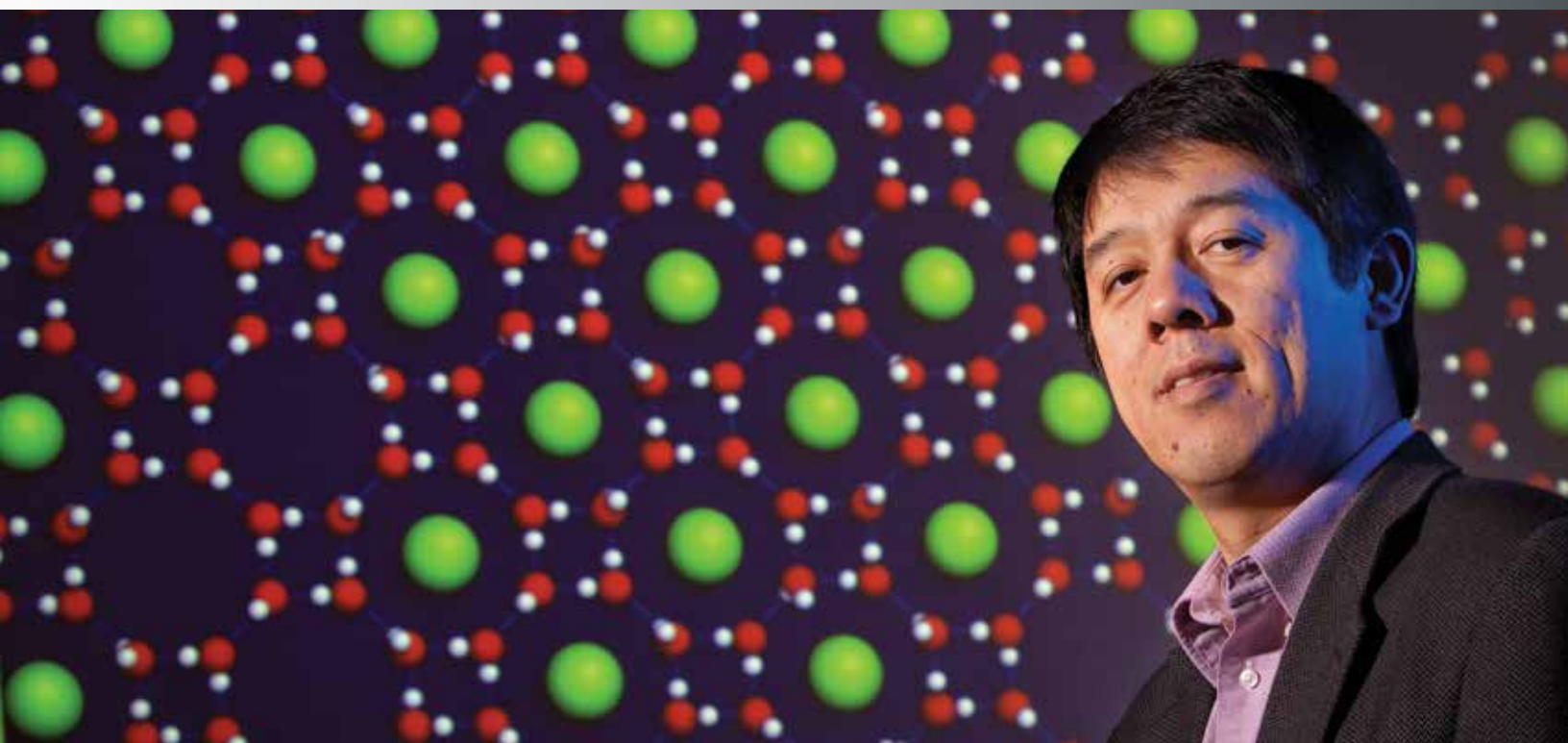
Ground Fluor Pharmaceuticals Inc. is a biomedical company developing new imaging agents for use in diagnosis and management of disease, and to help other companies better manufacture imaging agents for PET scans. For more information, go to <http://www.gfpharma.com>.

NUtech Ventures is a nonprofit affiliate of the University of Nebraska established to form innovative partnerships between academia and the private sector. For more information, go to <http://www.nutechventures.org>.

— Vicki Miller, UNL Research and Economic Development

Dr. Stephen DiMagno





Dr. Xiao Cheng Zeng

Zeng Named Royal Society of Chemistry Fellow

UNL's Dr. Xiao Cheng Zeng has been named a Fellow of the Royal Society of Chemistry in the United Kingdom. The Royal Society of Chemistry is one of the oldest scientific societies in the world. It is also the largest organization in Europe for advancing the chemical sciences.

Zeng, Ameritas University and Willa Cather Professor of Chemistry, was one of 12 new Fellows named by the society this year. Fellows are the most senior category of membership in the Royal Society of Chemistry and the honor recognizes those with substantial career progression and demonstrated seniority and maturity of experience in any field that involves or promotes the advancement or wider application of chemical science.

Zeng applied for the fellowship earlier this year after being appointed an associate editor in 2012 for *Nanoscale*, a society journal focusing on nanoscience and nanotechnology.

"When I was chosen as associate editor, I felt it was important to have some credentials within that society, which is why I applied," Zeng said. "Having only applied one time, it was very humbling to be selected. This is an honor not only to me but also to my team and the university."

Zeng, whose research interests are computation chemistry, materials chemistry and nanoscience, has made several groundbreaking discoveries, including how buckyballs make up the atomic structure of gold and Nebraska Ice—the nickname for the discovery that water contracts rather than expands when it is frozen at extremes of subnanoscale confinement.

Zeng said none of the discoveries could have been made without the support he has received from his research team and the university. He said Nebraska Research Initiatives and the Holland Computing Center have been extremely positive with which to work.

"The computing center really makes our research stay at the cutting edge," he said.

Zeng began his UNL career in 1993. He said he hopes his selection as a RSC Fellow will give the university more international recognition.

"The university has a mission to go global and gain international recognition and being a Fellow in that society will give more exposure to UNL," Zeng said. "And the university has been so good to me, I want to give back."

The university has a mission to go global and gain international recognition and being a Fellow in that society will give more exposure to UNL.

— Dr. Xiao Cheng Zeng



Faculty Accomplishments

Dr. Patrick Dussault, professor of chemistry, was recognized with the College of Arts and Sciences Outstanding Research and Creative Activity Award.

Dr. Marilyne Stains, selected as the winner of the 2014 Student Impact Award as an Outstanding New Advisor for a University of Nebraska Student Organization for her work advising the Chem Club!

Dr. Robert Powers, recognized by ACS as The Nebraska Local Section 2014 Outreach Volunteer of the Year!

Dr. Rebecca Lai, awarded a 2014 College Distinguished Teaching Award.

Dr. Alexander Sinitskii, assistant professor of chemistry, has been awarded the Harold and Esther Edgerton Junior Faculty Award.

Dr. Rebecca Lai, named Susan Rosowski Associate Professor of Chemistry.

Dr. Xiao Cheng Zeng, named a Fellow of the Royal Society of Chemistry in the United Kingdom.

Dr. Xiao Cheng Zeng, awarded the 2013 Outstanding Postdoc Mentor Award from the University of Nebraska-Lincoln. Professor Zeng will be formally recognized with this award at the UNL Research Fair on Thursday, November 7, during the luncheon.

Faculty Publications and Patents

Dr. Ronald Cerny and collaborators were published in *Biochemical and Biophysical Research Communications* on "Overexpression of human fatty acid transport protein 2/very long chain acyl-CoA synthetase 1 (FATP2/Acsvl1) reveals distinct patterns of trafficking of exogenous fatty acids." Volume: 440 Issue: 4 Pages: 743-748. Published: 2013

Barry Cheung, Xiao Cheng Zeng, and collaborators were published in *Angewandte Chemie-International Edition* on "Resonant photoemission observations and DFT study of s-d hybridization in catalytically active gold clusters on ceria nanorods." Ed. 52, 6936-6939. Published: 2013.

Dr. Stephen DiMagno and Ronald Cerny were issued a U.S. Patent (USPTO 8,377,704) on "Detection and Quantitation of Anions." 2/19/13

Eric Dodds and collaborators were published in *Analytical Chemistry* on "Ion mobility studies of carbohydrates as group I adducts: isomer specific collisional cross section dependence on metal ion radius." Volume: 85: 9728-9735. Published: 2013

Liangcheng Du and collaborators were published in *Angewandte Chemie-International Edition* on "Elucidating the Biosynthetic Pathway for Vibralactone: A Pancreatic Lipase Inhibitor with a Fused Bicyclic beta-Lactone." Volume: 52 Issue: 8, Pages: 2298-2302. Published: 2013

Rebecca Lai, Patrick Dussault, and collaborators were published in *European Journal of Organic Chemistry* on "Design and Synthesis of a Class of Twin-Chain Amphiphiles for Self-Assembled Monolayer-Based Electrochemical Biosensor Applications." Issue: 16 Pages: 3263-3270. Published: 2013

Mark Griep and collaborators published "Using Movie Clips to Teach Chemistry Formally and Informally in *Hollywood Chemistry: When Science met Entertainment* Book Series: ACS Symposium Series. Volume: 1139 Pages: 199-213. Published: 2013

Jiantao Guo and collaborators were published in *ACS Chemical Biology* on "An Expanded Genetic Code in Mammalian Cells with a Functional Quadruplet Codon." Volume: 8 Issue: 7 Pages: 1640-1645. Published: 2013

Marjorie Langell and collaborators were published in *Journal of Physical Chemistry C* on "Characterization of Copper Palladium Oxide Solid Solutions by X-ray Diffraction, X-ray Photoelectron Spectroscopy, and Auger Electron Spectroscopy." Volume: 117 Issue: 14 Pages: 7039-7049. Published: 2013

Hui Li and collaborators were published in *Journal of Physical Chemistry B* on "Solvent Electronic Polarization Effects on Na⁺-Na⁺ and Cl⁻-Cl⁻ Pair Associations in Aqueous Solution." Volume 117 Pages: 9273-9279. Published: 2013

Lawrence Parkhurst and collaborators were published in *Nucleic Acids Research* on "A small molecule directly inhibits the p53 transactivation domain from binding to replication protein A." Volume: 41 Issue: 3 Pages: 2047-2059. Published: 2013

Robert Powers and collaborators were published in *Current Metabolomics* on "NMR Metabolomics Analysis of Parkinson's Disease." 1(3):191-209. Published 2013

Andrzej Rajca and collaborators were published in *Journal of the American Chemical Society* on "High-Spin S=2 Ground State Aminyl Tetraradicals." Volume: 135 Issue: 48 Pages: 18205-18215. Published: 2013

Jody Redepenning and collaborators were published in *Journal of Biomedical Materials Research* on "Biomimetic composites by surface-initiated polymerization of cyclic lactones at anorganic bone: preparation and in vitro evaluation of osteoblast and osteoclast competence." Part A 2014, 102 (6): 1755-66. Published: 2014

Alexander Sinitskii and collaborators were published in *Journal of Materials Chemistry C* on "Synthesis of high-quality inverse opals based on magnetic complex oxides: yttrium iron garnet (Y₃Fe₅O₁₂) and bismuth ferrite (BiFeO₃)." Volume: 1 Issue: 17 Pages: 2975-2982. Published: 2013

Marilyne Stains and collaborators were published in *Concepts of Matter in Science Education* on "Implicit assumptions to track the progress of learning about the structure and motion of matter in students aged 13 through graduation from university." Published: 2013

Jian Zhang and collaborators were published in *Chemical Communications* on "A "pillar-free", highly porous metalloporphyrinic framework exhibiting eclipsed porphyrin arrays." 49, 2828-2830. Published: 2013

Mass Spectrometry at UNL has a Rich and Long Heritage

The Nebraska Center for Mass Spectrometry (NCMS) would not be the center it is today without the amazing shapers and dreamers from our past. NCMS was founded as one of the six original NSF Regional Instrumentation Centers in 1979, then under the leadership of Michael Gross and Gerhard (Gerry) Meisels.

In collaboration with faculty member Charles Wilkins, they forged frontiers in gas phase ion chemistry using some of the world's first Fourier transform (FT) mass spec instruments.

Without question Gross put UNL's Center of Mass Spectrometry on the map. Grounded in his formal training as an organic chemist, Gross was an early leader in the study of ion-molecule reactions using mass spectrometry. The Midwest Center for Mass Spectrometry (MCMS) soon became internationally known as a leading laboratory in mass spectrometry. Later the facility would be renamed as the Nebraska Center for Mass Spectrometry (NCMS). In 1982, the first commercially-available tandem magnetic sector mass spectrometer was added to the facility. In the years following, the NCMS played a pioneering role in the development of tandem mass spectrometry in the study of biomolecules. Gross was named as a 3M Alumni Professor of Chemistry in 1983 and a C. Petrus Peterson Professor of Chemistry in 1988.

Professor Gross has over 400 publications in mass spectrometry and has received numerous awards.

Another historical notable was Nebraska's involvement with the *Journal of the American Society for Mass Spectrometry* (JASMS), the standard disciplinary journal in the MS field, which was founded in 1990 by Gross at UNL.

In 1994, Professor Gross moved to Washington University in St. Louis as Professor of Chemistry, Medicine, and Immunology and as PI of the NIH Mass Spectrometry Research Resource there. His research interests continue to lie in the development of mass spectrometric methods, particularly FT methods, to understand interactions between proteins and ligands, to elucidate the gas-phase chemistry of oligodeoxynucleotides.

Following the Gross era at Nebraska, David and Jean Smith were brought in as senior hires from Purdue. David Smith and his co-workers, including then Ph.D. student John Engen, developed state of the art methods to study the protein folding problem and the mechanism by which chaperone proteins assist in protein folding via sophisticated, cutting-edge, H/D exchange-MS methods. For example, ground-breaking MS-based studies on how the chaperone protein GroEL functions were carried out collaboratively between Nebraska (David Smith and Jiwen Chen) and Yale (Art Horwich) and published in *Nature Structural & Molecular Biology* (http://www.nature.com/nsmb/journal/v8/n8/full/nsb0801_721.html). Jean Smith's program involved the study of post-translational modifications (PTMs) on eye lens crystallins proteins by MS. Of particular interest to Jean were PTMs associated with aging and eye lens cataract formation.

The American Chemical Society's highest award for Mass Spectrometry is the Field/Franklin award. This award has already been conferred on three members/alumni of the NCMS; namely Charlie Wilkins (1997), Mike Gross (1999) and David Russell (2013).

Notable NCMS alumni and center members include John Engen (Professor of Bioanalytical Chemistry, Northeastern Univ.) who studied under David Smith; David Russell (Chair of Chemistry, Texas A&M), David Miller (Chief Operations Officer/Chief Technology Officer, Idaho National Lab), and Edward Chess (Sr. Director of Research, Baxter Health) who all studied under Michael Gross. Additionally, Huayi Tong, who worked on trace analysis of dioxins in Agent Orange in the 1980's, is now Head of Analytical North America BASF Corporation. The latter three are all current members of the UNL Chemistry Industrial Advisory Board.

The tradition of Mass Spec excellence continues at Nebraska and includes faculty who have been with the department for decades developing this center into a scientific icon. Today, Ron Cerny, a Gross mentee, is Director of the NCMS, and is actively engaged in collaborative proteomics work. Kurt Wulser, a Nebraska Ph.D. (1991) under Marjorie Langell, serves as Instrumentation Specialist, helping to maintain the large body of sophisticated instrumentation at the NCMS.

Eric Dodds is the latest faculty member to build a research program at Nebraska that investigates problems at the frontiers of mass spectrometry. Dr. Dodds and his research group are developing fundamentally new methods for the study of glycans and glycopeptides utilizing multi-dimensional MS methods that take advantage of carbohydrate metalation, ion mobility separation, and novel approaches to fragmentation.

Kevin Van Cott, a faculty member in the Department of Chemical and Biomolecular Engineering at UNL, also houses his instrument in the NCMS facility and studies monoclonal antibodies.

As was the case in 1979, the NCMS continues to be located in Hamilton Hall, the 220,000 square foot building dedicated to Chemistry, with the Center occupying newly renovated space on the 7th floor. Please ask to tour the NCMS facility next time that you come through Lincoln.

Carrying the Torch of Mass Spec Excellence

Nationally known for our state-of-the-art mass spectrometry center, the University of Nebraska-Lincoln, in conjunction with Waters Corporation Centers of Innovation, sponsored a complimentary symposium this past fall. The symposium program was designed for scientists with an interest in protein science.

'Mass Spectrometry' continued on page 11

'Mass Spectrometry' continued from page 10

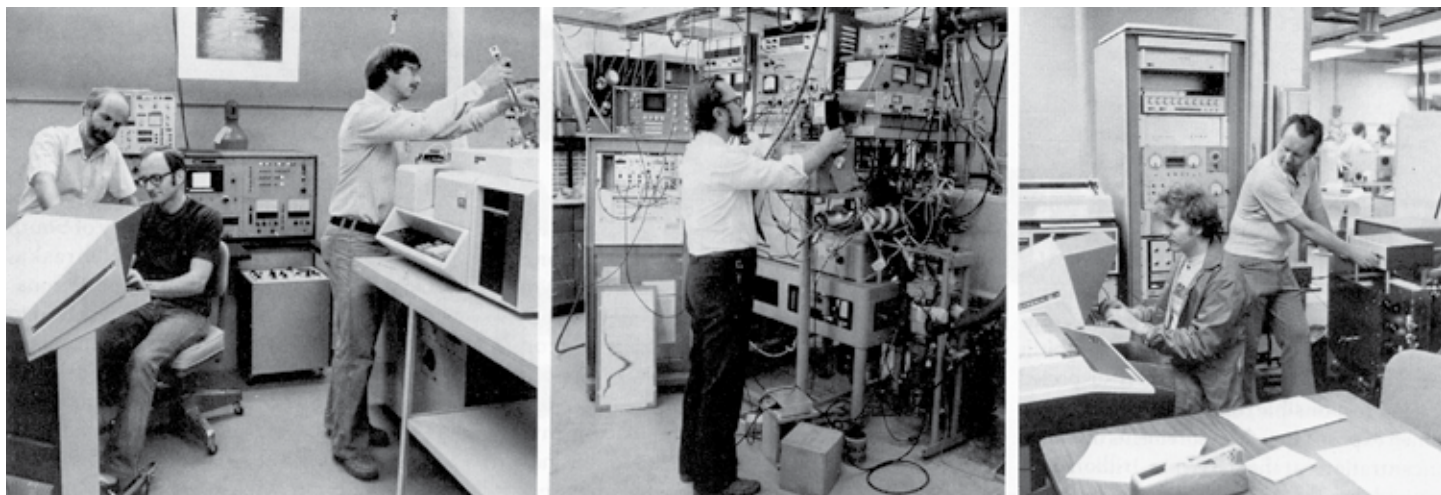
Prominent speakers outside the University included:

- Michael L. Gross, Ph.D., Washington University in St Louis and former UNL professor presented: "Can Mass Spectrometry Play a Role in Protein Biophysics?"
- Fred E. Regnier, Ph.D., Purdue University presented: Targeted Glycoproteomics
- Ron Orlando, Ph.D., University of Georgia presented "The Sweet Life: Identification and Quantification of Biologically Important Glycoprotein Glycans"
- M. Arthur Moseley, Ph.D., Duke University School of Medicine presented: "UPLC/UPLC/IMS Separations coupled to Tandem MS for Biomedical Proteomics"
- Dr. Scott Geromanos, Waters Corporation presented "Forensic Ion Accounting: Enhancing Clarity and Depth-of-Coverage"

University of Nebraska speakers:

- Jiri Adamec, Ph.D., Dept. of Biochemistry presented "Oxidative Stress Induced Protein Modifications: Top-down and Bottom-up"
- Kevin Van Cott, Ph.D., Dept. of Chemical and Biomolecular Engineering presented "Characterization of Recombinant Therapeutic Glycoproteins"
- Eric D. Dodds, Ph.D., Dept. of Chemistry presented "Engaging Challenges in Glycoproteomics"
- Pawel Ciborowski, Ph.D., Dept. of Pharmacology and Experimental Neuroscience, UNMC presented "The Histone Posttranslational Modification Milieu in Human Primary Macrophages"

A Peek into the Past with Historical NCMS Archives...



At Nebraska. Instruments at the Midwest Center for Mass Spectrometry include, from left, the MS-50 mass spectrometer, the photo-ionization mass spectrometer and a Fourier transform mass spectrometer. At the instruments, across the page from left, are Michael L. Gross, Philip A. Lyon, Frank Crow, Gerhard G. Meisels, Robert White and Charles L. Wilkins.

'NCMS Archives' continued on page 12

'NCMS Archives' continued from page 11

NSF sets up regional instrument centers

The first six facilities in a pilot program prepare to open; each aims to offer state-of-art instruments for sharing by researchers from all fields

Rebecca L. Rawls
C&EN, Washington

The National Science Foundation, funder of experiments, is trying a major experiment itself: providing instrumentation facilities for U.S. science. Instead of providing financial support for instrumentation purchases only as part of research grants, NSF has begun a pilot program to develop regional, state-of-the-art instrumentation facilities that can be shared by researchers at different institutions, in different disciplines, even by researchers in industry as well as academia.

The first six facilities in the program are now in the process of getting their equipment installed and new space allocated. Most hope to be operating as regional facilities by late summer or fall. They have begun to send out feelers to the rest of the scientific community to find out how busy they can expect to be and what sort of projects they may soon be involved in.

The reasons for such a program are obvious. Instrumentation is so expensive and becomes obsolete so quickly that buying it is beyond the budget of all but a few research groups or institutions. The only way to make such instrumentation broadly available is to share it. The sophistication of many modern instruments also requires a large staff to maintain them in best operating condition, an expense that is also difficult for individual institutions to bear.

Sharing instruments also may have some other benefits. It could encourage cooperation between scientific disciplines, and, a rare aim for NSF, between scientists in universities and those in industry.

Industrial scientists find it as difficult to buy expensive instrumenta-

tion as their academic counterparts do, and only the largest companies have state-of-the-art instruments in many fields. However, as at universities, many worthwhile scientific experiments are envisioned by researchers at companies that do not have the instrumentation needed to carry out the research.

NSF has always had trouble deciding how much it can support research in industry. For this pilot program, industrial scientists who intend to publish results in the scientific literature can use the facilities.

"We want to emphasize that these aren't just chemistry facilities," says Arthur F. Findeis, head of NSF's chemical synthesis and analysis section, which is funding the program. "These are resources for U.S. science—biochemistry, pharmacology, biophysics, engineering, right down the line. And they are for industrial scientists as well as those in academia."

The first six grants in the new program, totaling \$3.45 million for the first year, were awarded last summer. This year, about \$3.5 million has been allocated for new grants, in addition to continuing funding for the six programs begun last year. Next year's budget request contains about \$4 million for new grants.

Most of the money in each grant

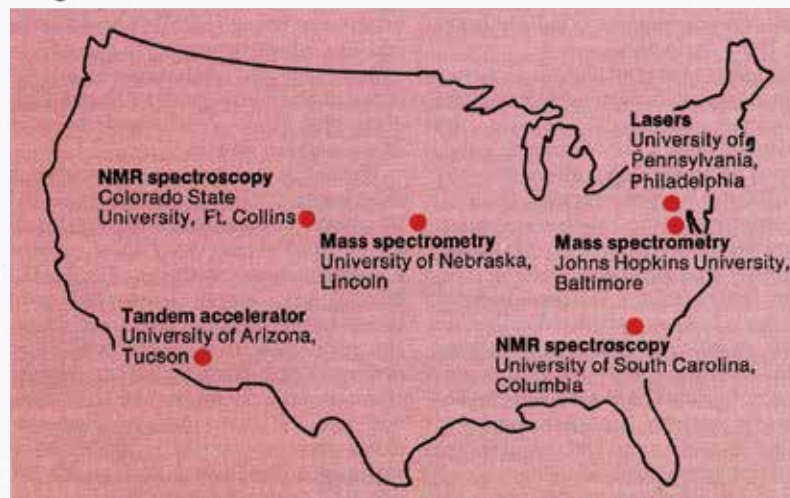
goes toward purchasing equipment, but the grants are made for four years and include money for support personnel and for maintaining the state-of-the-art capability of each facility.

The first six regional facilities are a carbon-14 dating and trace analysis by accelerator facility at the University of Arizona, very-high-resolution nuclear magnetic resonance spectrometers at Colorado State University and the University of South Carolina, high-mass-analysis mass spectrometers at Johns Hopkins University and the University of Nebraska, Lincoln, and a laser facility at the University of Pennsylvania.

All of these facilities are being established at universities that already have strong state-of-the-art programs in the areas of their grants. In fact, present excellence in research and techniques related to the facility and recent creative productivity in that area are major criteria in selecting which regional facility proposals will be selected for funding. The regional centers are to have a major teaching role in showing scientists who have never had access to their type of instrumentation how to design experiments to take best advantage of the equipment available at the center.

These first six laboratories, in four different areas of instrumentation,

Regional laboratories have diverse activities



Article from June 18, 1979, Chemical & Engineering News archive.

Avery Hall's Cornerstone Time Capsule Removed

Mark Griep has uncovered a bit of chemistry history in the cornerstone of Avery Hall.

The stone, placed in 1916 during the construction of the building, held a time capsule that may contain a photo of Rachel Holloway Lloyd—the University of Nebraska's second chemistry professor whose research helped launch sugar beet growing across the state.

Lloyd is to be featured in an American Chemical Society historical plaque that will be placed in Hamilton Hall. Griep, an associate professor of chemistry, hopes to incorporate items within the time capsule at an October celebration of Lloyd's career.

A crew from Krivda and Son Masonry removed the time capsule—a roughly 18 inch wide by 12 inch tall copper box—in about two hours the morning of May 12.

"I've been telling people the story of Rachel Lloyd since 1998," Griep said. "She is the first American woman to get a Ph.D. in chemistry. We believe she is also the first of two women to teach chemistry at a U.S. research university. And, in 1891, Lloyd became the second woman to join the American Chemical Society. (See *related article on next page.*)

"She was truly a pioneer in the field of chemistry."

In the pursuit of the historical plaque, Griep has found only one photo of Lloyd—a portrait available in the University Archives. A 1916 newspaper article from the Red Cloud Chief might help expand the photo total.

"The article says the cornerstone contains a Cornhusker yearbook, a newspaper, a collection of chemicals and photographs of the chairs of chemistry and others," Griep said. "Rachel Lloyd is included in the list of those photos. There's a good chance the photo is the same one as in the University Archives, but we won't know for sure until we open the box."

James and Karen Linder are paying for the time capsule retrieval. James Linder is NU's interim president and both have served as faculty at the University of Nebraska Medical Center.

The Linders cited their backgrounds in medicine and chemistry; Lloyd's story; the importance of promoting women in science; and an interest in the career of H.G. Deming, a University of Nebraska chemistry professor in the 1920s to 1930s, as reasons for offering support to the cornerstone project.

'Avery Hall Time Capsule' continued on page 22



Dr. Mark Griep, associate professor of chemistry, shows the Avery Hall cornerstone time capsule to a group of students from York Middle School. The time capsule was removed on May 12.



Krivda and Son Masonry employees (from left) Ben Krivda and Chris Krivda begin the process to remove the Avery Hall cornerstone on May 12, 2014.

Retreat Aimed at Connecting Faculty with the Land

Every year the department chair and his assistant plan a faculty retreat to discuss the academic agenda of the following year and any pressing concerns or upcoming changes in the foreseeable future. Since the Department of Chemistry has faculty from not only all over the United States but all over the world, Dr. Berkowitz wanted to choose a venue that was truly Nebraskan in nature, "I wanted the faculty to not only connect with each other on this retreat but also to the land. I think it is important that our faculty are aware of the uniqueness that is Nebraska. So Dr. Berkowitz chose to include a visit to the Rowe Sanctuary to experience the annual migration of the sandhill cranes. Every year during March and early April, over 500,000 sandhill cranes migrate on the Platte River valley in order to 'fuel up' before resuming their northward migration.

Rowe Sanctuary's viewing blinds are strategically placed along the Platte River to provide excellent views of the sandhill cranes while they are on their river roost.

In addition to the wonderful and amazing views, the faculty had a great time. But it wasn't all play. One of the topics discussed was a modification to the graduate program designed to better integrate the various parts of our graduate program and to streamline the training of our students. Another desired consequence of these changes will allow for greater ease in the multi-disciplinary student training. The four biggest changes were:

- 1) As of Fall 2014, cumulative exams will no longer be required for incoming students.
- 2) A written component will be included as part of the RUI Exam for entering graduate students.
- 3) The OPO exam will occur slightly sooner than before.
- 4) The former division seminars are being reorganized and combined into three multidisciplinary seminars: ABA (Analytical/Bioanalytical); OCB (Organic/Chemical Biology) and PIM (Physical/Inorganic/Materials).

These changes were discussed this spring with the graduate students and were well received. Here's to another successful academic year.

Sandhill cranes in the Platte River



Dr. Rachel Lloyd Selected as a National Historic Chemical Landmark



Dr. Rachel Lloyd

It is not very often that the Department of Chemistry can claim that one of its own has been selected as a National Historic Chemical Landmark by the American Chemical Society, so we are extremely excited to announce that Dr. Rachel Lloyd, UNL faculty from 1887-1895 was awarded this honor. The awards ceremony will be held Oct. 1-2, 2014, at UNL during the Dr. Rachel Lloyd Memorial Conference on Women in Science.

Dr. Rachel Abbie Holloway Lloyd was the first U.S. woman to earn a Ph.D. in chemistry. Since the first pioneers settled on the plains of Nebraska, agriculture was and continues to flourish due in great part to the teaching and research contributions of Dr. Rachel Lloyd. Since Nebraska was not rich in precious minerals, there was not initially a great demand for chemists. One crop that required trained chemists and could be grown in Nebraska was the sugar beet. In June of 1887, Dr. Rachel Lloyd accepted the offer to become an associate professor of analytic chemistry at the University of Nebraska, and to become the first assistant chemist of the newly formed Agricultural Experimental Station located on the eastern edge of Lincoln. She conducted sugar beet studies that continued for the next decade at the University showing great promise for a lucrative crop.

A series of collinear events brought sugar beet refining to Nebraska in 1890. For instance, the farmers and developers of Grand Island, Neb. were exploring for the most profitable types of agriculture. Simultaneously, the U. S. Department of Agriculture was trying to reduce the Nation's dependence on sugar exports from France and Germany. Not to mention the Union Pacific railroad was looking for ways to increase rail traffic. The University of Nebraska chemistry professors were interested in creating more chemical occupations for their students. Lastly, a group of sugar beet capitalists were in search of the highest economic gain at the lowest possible risk. Nebraska offered what each of them wanted.

Dr. Lloyd trained the best of her graduate students and undergraduates in beet sugar analysis. Training so many inexperienced workers would require time, patience, and great organizational skills. All attributes Lloyd is said to have had. She combined her students' data with the farmers' information about seed variety, acreage, climatic conditions, soil, agricultural procedures, costs, and yields per acre to provide an unbelievably complete analysis of Nebraska-grown sugar beets. One result was that Grand Island built one of the Nation's first beet sugar factories in 1891 and within a few years of her research, sugar beets became one of the largest crops in Nebraska. Another result was that demand for analytical chemists rose.

For further information about Dr. Rachel Lloyd, the Awards Ceremony or the Conference, please contact Dr. Mark Griep, associate professor of chemistry, **UNL, 402-472-3429** or mark.griep@unl.edu.

Ivan Moreno: Recipient of National Science Foundation Fellowship



Ivan Moreno

Ivan Moreno is one of 10 UNL students who have recently received National Science Foundation Fellowships. Moreno is using his award to further his graduate study into solar energy.

Moreno is packing his bags and heading to sunny California. It makes sense for the UNL alumnus, since he's starting graduate research on solar energy.

Moreno will begin working under Nathan Lewis, professor of chemistry at California Institute of Technology, this summer, thanks in part to a National Science Foundation Fellowship, which provides a

stipend for three years and several unique opportunities.

Moreno, who graduated in May with a degree in both chemistry and physics, has always wanted to be a scientist, and getting his undergraduate degree at UNL was an important step toward that goal, especially with the assistance he received as a UNL McNair Scholar. The McNair Program is funded through a grant from the U.S. Department of Education and prepares selected undergraduates for graduate study by providing opportunities to define goals, engage in research and develop the skills critical to success at the doctoral level. The program serves students who are first generation with financial need and students who are underrepresented in graduate populations.

"The McNair Program made a huge difference," Moreno said. "Everyone has the ingredients to make a cake in their place, but not everybody knows how. The McNair Program is the recipe to my college experience. It helped me put together my research, outreach activities and other things that made me a good candidate for graduate school."

While an undergraduate here, Moreno completed UCARE research on cerium oxide nanorods with Barry Cheung, associate professor of chemistry, and produced research for the McNair program under Martin Centurion, assistant professor of physics and astronomy.

When deciding which direction to take his research in the future, Moreno wanted to combine his physics and chemistry knowledge into a field that could make an impact.

"I want to do something about global warming and solar energy fits with my expertise," he said. "I think I can really make a difference there."

Thanks to his work at UNL and the NSF Fellowship, Moreno gained acceptance to the CalTech graduate program, his first choice.

According to the NSF website, the fellowship pays a stipend annually, as well as a cost-of-education allowance to the institution the student chooses to attend. More than 14,000 applications were received for the 2014 competition, but only 2,000 fellowships were awarded.

Congratulations Ivan Moreno, we are excited for your next stage in life!

Milton E. Mohr and Department of Chemistry Student Awards and Scholarships

We believe we have the best chemistry students out there, so when we get the chance to recognize them for all their hard work, we want to shout it from the roof tops. So, it gives us great pleasure to announce this year's Milton E. Mohr and Department of Chemistry Student Awards and Scholarships. The winners are as follows:

Milton E. Mohr Undergraduate Scholarship Recipients:

Schuyler Chambers	Mitchell Milanuk
Yao Liu	Megan Vandergriend

Graduate Milton E. Mohr Fellowship Recipients:

Ryan Matsuda	Anita Zaitouna
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Undergraduate Scholarships:

Marjorie Dewey & Catherine Kelly SS/FSC

Michael Barrios-Ramirez	Christopher Lubbers
Megan Lee	

Viola C. Jelinek Scholarship in Chemistry

Scott Ingham	Maria Podariu
Yao Liu	Tyler Reeson

Lester C & Joan M Krogh SS & FS in Chemistry

Lukas Brenden	Tressa Gloystein
David Cordwin	Molly Miller
Ryan Geisert	

Sandoz Foundation Chemistry Scholarship

Kate Durst	Tyler Koupal
Cameron Gilinsky	Trevor Reimnitz
Rebecca Jarratt	Megan Vandergriend

Maxine Wertman Fund Scholarship

Alleah Bouley	Ashton Neylon
Samantha Lonergan	Jeff Post
Hannah Milenkovich	Olivia Thomas

Dr. B Clifford Hendricks Memorial Fund Scholarship

Drew Dudley

Clyde & Elva Weyenberg Scholarship

Mitchell Milanuk

Ralph F. Nielsen Scholarship

Kevin Real

'Student Awards and Scholarships' continued on page 16

Student Awards and Scholarships, *continued from page 15*

Also every year, we like to recognize our outstanding teaching and research assistants. With so many excellent applicants it is hard to recognize all our deserving students because they all do such amazing work, but these students do make us proud.

Award Winners:

Outstanding Undergraduate Teaching Awardee

Adam Zabih

Outstanding Undergraduate Teaching Awardee

Navid Rahmany

Outstanding Undergraduate Research Awardee

Mitchell Milanuk

Robert Marianelli Undergraduate Research Awardee

David Szalewski

John J. Stezowski Graduate Teaching Assistant Awardee

Zane Gernhart, *Advised by Dr. Barry Cheung*

George Sturgeon Graduate Teaching Assistant Awardee

Greg Applegate, *Advised by Dr. David B. Berkowitz*

Fuerniss Fellowship Awardee

Kaushik Panigrahi, *Advised by Dr. David B. Berkowitz*

Cromwell Graduate Research Assistant Awardee

Rachel Willand-Charnley, *Advised by Dr. Patrick H. Dussault*

Gordon A. Gallup Graduate Research Assistant Awardee

Anita J. Zaitouna, *Advised by Dr. Rebecca Y. Lai*

Korean Alumni Graduate Research Assistant Awardee

Yunyun Zhou, *Advised by Dr. Barry Cheung*

Student Awards Colloquium

Anita J. Zaitouna, Yunyun Zhou, and Rachel Willand-Charnley also presented at this year's Student Awards Colloquium after the honors were awarded. It is easy to see why these three students were nominated and asked to present at the colloquium.

Anita J. Zaitouna, winner of the Gordon A. Gallup Graduate Research Assistant Award, attended Wayne State University (Detroit, Michigan), where she received a B.S. in chemistry and biology. She participated in undergraduate research in David E. Benson's lab under the tutelage of Marla Swain. Zaitouna's focus was on site directed mutagenesis of a lead binding protein.

For graduate school, Zaitouna joined Dr. Rebecca Y. Lai's research lab in 2010 at UNL. Since joining UNL, she has focused on electrochemical self-assembled monolayer based-biosensors. Through collaborations, Zaitouna has had the opportunity to branch out and learn about mass spectrometry, spectroscopic ellipsometry, quartz crystal microbalance with dissipation, graphene and titania substrates for biosensors, and cell-based biosensors.

Since 2010, she has published seven papers, filed one patent, presented six lectures and seven posters, mentored eleven people, attended many workshops and participated in Phi Lambda Upsilon—Rho Chapter (2011/2012 vice president and co-creator of the 2012 Newsletter), Electrochemical Society, Nebraska Academy of Science, and the American Chemical Society. Zaitouna has also participated in a large number of outreach activities that have been designed to reach a broad audience through either Harry Potter or deoxyribonucleic acid (DNA) nanoscience. She has also made several YouTube videos of the DNA activities. Additionally, Zaitouna has taught general chemistry lab and recitation, as well as instrumental analysis lab.

She has been one (of five in the Chemistry department) awarded the NSF Department of Education Graduate Assistant in Area of National Need (GAANN). Zaitouna has won best poster at the 2nd International Biosensors and Bioelectronics Conference. She has been awarded a Department of Chemistry Travel Fellowship and has recently been acknowledged by the chemistry department with the previously mentioned 2013-2014 Gordon A. Gallup Award as well as by the biochemistry department with the 2015 Milton E. Mohr Award.

Upon graduation, Zaitouna is focused on taking her Husker experience and further developing her scientific base as a post-doctoral researcher. Eventually, she plans to teach at a primarily undergraduate institution and coordinate science communication with the public.

Yunyun Zhou, winner of the Korean Alumni Graduate Research Assistant Award, attended the Ocean University of China (Qingdao, China) where she received her B.E. degree in chemical engineering and technology. Zhou participated in undergraduate research under the supervision of Prof. Chunhu Li and Prof. Yangdong Hu. Her research focused on the design of continuous flow system/reactor for styrene production.

Finding her great passion for catalysis science, Zhou decided to join Dr. Chin Li (Barry) Cheung's research group at UNL after she spent two years of solid state NMR graduate study with the University of Dayton. In Prof. Cheung's group, she developed her skills in the synthesis of rare earth metal oxide nanomaterials and characterization, the application of noble metals based rare earth metal oxide nanocatalysts in chemical reactions, and the application of catalytic design using different methods.

Doing research is having fun to Zhou. With Prof. Cheung's support, she joined several different programs to expand her research ability. She has been to the Center for Advanced Microstructure Devices (CAMD) (Baton Rouge, LA) twice for X-ray absorption spectroscopy training, where she initially developed her synchrotron radiation experimental skills to effectively characterize the nanomaterials. During 2013, Zhou went to Shanghai Synchrotron Radiation Facility (Shanghai, China) and Brookhaven National Lab (Upton, New York) to further gain more experience in the X-ray absorption spectroscopy for her research. Through the NSF EPSCoR RII program, Zhou had an internship with the University of Puerto Rico (San Juan, Puerto Rico) and worked in an electrochemical group where she extended her research area to electrochemical catalysis.

'Student Awards and Scholarships' continued on page 17

Student Awards and Scholarships, *continued from page 16*

Zhou has published three papers so far and submitted another two papers recently. One of her papers has been published in the journal of *Angewandte Chemie International Edition* (IF 13.734). This research project is also reported in the Annual Report of EPSCoR program due to its outstanding significance. She has also presented six posters in several different conferences, such as Gordon conference, ACS Midwest Conference, and NSF EPSCoR RII Conference; attended many workshops; and mentored students from NCMN and ACS SEED summer programs.

Zhou's future plans include a post-doctoral position after she receives her Ph.D. degree. With two or three years post-doctoral experience, Zhou aims at finding a faculty position in a research institute to pursue her passion of scientific research.

Rachel Willand-Charnley, winner of the Cromwell Graduate Research Assistant Award, graduated with honors from Creighton University where she received her B.S. in biology. Her prior research accomplishments have spanned virology and chemical biology with Dr. William Tappich at the University of Nebraska at Omaha. She investigated and performed genetic mutations on Coxsackievirus B3 (CVB3), a picornavirus that causes myocarditis and pancreatitis, and is believed to be involved in type I diabetes. She investigated the RNA element, known as the cloverleaf, required for initiating negative-strand RNA synthesis.

Her research accomplishments as a UNL graduate student, under the direction of Dr. Patrick Dussault, have focused on advancing the fields of organic synthesis and organic oxidation chemistry. The first portion of her thesis work focused on developing a methodology for the reductive ozonolysis of alkenes that would take advantage of the ability of ozonolysis to generate carbonyl compounds while bypassing formation of ozonides and other hazardous co-products formed under traditional conditions. Willand-Charnley's investigations led her to a mechanistically unprecedented organocatalyzed decomposition of the carbonyl oxide in the presence of pyridine. The overall process offers a fast, general, high-yielding, and safe route to aldehydes and ketones based simply upon reaction in the presence of stoichiometric pyridine. Willand-Charnley next investigated application of the reductive methodology in tandem with a number of popular synthetic reactions typically conducted as part of a sequence involving ozonolysis. The results she obtained are expected to allow investigators to streamline synthetic sequences, offering high yields and reduced reaction times. More recently, she developed a new methodology for the synthesis of cyclic ethers, with a focus on oxetanes and oxaspirocycles, structures often difficult to prepare via existing methods. She is currently optimizing reaction conditions for two projects, the generation of the oxetene, a strained four membered ring ether, and the installation of the bridged oxetane ring within the [3.1.1] dioxabicycloheptane core of thromboxane A₂, a natural product for which only a single synthesis has been reported.

Since joining the Dussault group in 2010, she has published three high impact publications, filed one patent, and is currently working on two manuscripts. Willand-Charnley has presented her work at seven conferences around the nation,



Anita J. Zaitouna



Yunyun Zhou



Rachel Willand-Charnley

participated in a large number of scientific outreach opportunities, including being the local Phi Lambda Upsilon-Rho Chapter President and co-creator of the 2012 Newsletter. She is an active member of the Nebraska Academy of Science, American Chemical Society, and the American Association for the Advancement of Science. Willand-Charnley has been nominate for a national research award and has been awarded a Department of Chemistry Travel Fellowship in addition to the aforementioned Norman Cromwell Graduate research award.

In 2013, Willand-Charnley was nominated and selected to become a Preparing Future Faculty Fellow with the University of Nebraska-Lincoln. During her fellowship she spent time at the University of California, Berkeley under the mentorship of Dr. Carolyn Bertozzi. During her time with the Bertozzi group, Willand-Charnley secured a postdoctoral fellowship with Dr. Bertozzi that will begin upon her graduation in December of 2014. During her postdoctoral appointment she will be developing a new bioorthogonal methodology specifically aimed at the construction of theranostic multiplexed antibody constructs with applications in breast cancer treatment and diagnosis. Willand-Charnley plans on pursuing a career as an independent investigator at an R1 institution with continued emphasis on the development and application of bioorthogonal chemistry in cancer therapeutics.

Congratulations to our Graduates:

The Department of Chemistry would like to congratulate the following graduates. You are now officially UNL Chemistry Alumni!

Nhu Dinh	CHEM-B.S.
Alyssa Emodi	CHEM-B.A.
Elizabeth Grigsby	CHEM-BA.
Emily Krumbach	CHEM-B.A.
Kaitlyn Levine	CHEM-B.A.
Ivan Moreno-Hernandez	CHEM-B.S.
Jacob McClinton	CHEM-B.S.
Quynh Nguyen	CHEM-B.A.
Lauren Olberding	CHEM-B.A.
Dae Park	CHEM-B.S.
Emily Snell	CHEM-B.S.
Phillip Svoboda	CHEM-B.A.
Nicholas Teets	CHEM-B.A.
Kevin Wintz	CHEM-B.A.
Ben Wymore	Ph.D.
Nathan Thacker	Ph.D.
Hongbo Zhu	Masters

Ovation and Applause Honors

The College of Arts and Sciences has several programs for honoring staff. One is the Ovation program which honors college student workers who perform their jobs extraordinarily well and the other is the Applause program which recognizes staff employees. This spring semester we were honored with two awardees:



Ye "Angie" Lin

Ovation Award:

Ye "Angie" Lin was honored this semester with the Ovation Award. Here's what her nominators had to say:

"Angie is just the very best student worker ever! Any request is completed perfectly, on time and with a smile! She is always willing to help with filing, setting up files and running things to other departments. She can be depended upon to help with

colloquia each week and any other extra occasion that occurs. She is well deserving of the Ovation Award!"

"Angie is a dedicated and dependable student worker in the Business Office. Her variety of duties (some of which are not the most glamorous) are always completed with care and precision. I appreciate her detailed follow up on projects she has completed. She takes her position very seriously and wants to do her best at everything she does. I enjoy seeing her smiling face in the office and think she is well deserving of an Ovation Award!"

"Ye "Angie" Lin is a great student employee for the chemistry department and very deserving of an Ovation Award. In her own quiet way she goes about completing her work duties and any other project given to her, without complaining and with a smile. These tasks may include running errands all over campus (even in freezing weather), copying, typing, label making, putting together packets, and helping with special events. She is very dependable and always lets me know if she is unable to get a project done today but assures me she will get it done soon."

"Ye "Angie" Lin is a wonderful student worker who I enjoy working with. For every task she is given, she greets it with a smile. I can always depend on Angie to finish one of my projects on time and correctly. Angie is very thorough with every project she is given and works independently with little assistance. If she has any questions, Angie seeks out that person for clarification. I appreciate how she wants to complete the project correctly the first time. I greatly appreciate her positivity because it is infectious. For these reasons and many more, I nominate Ye "Angie" Lin for an Ovation!"

"It is my pleasure to nominate Ye "Angie" Lin, a student worker in our front business office for an Ovation Award. Anyone who has worked with Angie knows that she is an incredibly hard worker and is devoted to making sure she gets all of her tasks done. Angie's day-to-day work can consist of a variety of different tasks such as copying projects, updating databases, doing runs across campus, posting notices around the building, and assisting with colloquia. She does all of these things and many more without any complaints. She is definitely someone you want to have work on a project. You know it will always get done. The Ovation Award is a great way for us to acknowledge all of Angie's hard work and positive attitude. Thanks Angie!"



Kerry Vondrak

Applause Award:

Kerry Vondrak, recruitment/communications coordinator, was honored this semester with the Applause Award. Here's what her nominators had to say:

"Kerry is very deserving and overdue to receive the Applause Award. She is very upbeat, positive and extremely good at all of her roles in the department and

there are many roles she plays. She is very positive and this is an infectious quality. Kerry is also very artistic and this shines through in her role as communications director. She is very organized, and a joy to work with. As recruiting coordinator she also carries these qualities through with her role. Kerry is a huge asset to the chemistry Department!"

"Kerry has awesome performance in serving the mission of the chemistry department, especially in the areas of the graduate recruitment, the design of branding documents, maintenance of the website and social media sites, and outreach activities. She is very efficient in working with many chemistry staff and faculty members to facilitate the completion of her assigned tasks which are often complex in nature. Since she joined UNL, I have been working with her on many complicated tasks. She never leaves a job hanging in the middle of the air. She always finds a way to solve "sensitive" problems without making some parties angry. Her skills and her dedication to her work at UNL are great assets to UNL. Therefore, I strongly recommend Kerry for the Applause Award!"

"I am a new assistant professor in the department and one of the most important parts of starting a new group is getting students. Kerry is our graduate recruiting coordinator and she is excellent! We have worked together closely on recruiting since before I came to campus officially and she has always gone the extra mile to help me engage the top recruits by proactively pointing out strong applicants and integrating me seamlessly into department recruiting events. Her ability to relate to the students and put Nebraska's best foot forward is a tremendous asset to the department and in many ways her personality has helped build an identity for the department (especially from the student perspective). I always say the biggest asset/most critical component of a department is the students and based on her pivotal role (which she plays to perfection) in this aspect of our operation I am pleased to nominate Kerry for an Applause Award!"

Congratulations to both of you!

Joseph S. Francisco to lead the College of Arts and Sciences

We are happy to announce that the University of Nebraska–Lincoln has selected Joseph S. Francisco, former president of the American Chemical Society (ACS: <http://www.acs.org/>) and member of the National Academy of Sciences, as dean of its College of Arts and Sciences. Dr. Francisco will also serve as a Cordes Chair and Professor of Chemistry in our department. The appointment was approved by the NU Board of Regents and began July 1.

Chemistry Department Chair David Berkowitz noted that Francisco “is a star in the world of chemistry bringing notoriety to the college and department with his numerous scientific achievements and renowned leadership skills.” Francisco received an NSF Presidential Young Investigator Award, an Alfred P. Sloan Fellowship and a Camille and Henry Dreyfus Foundation Teacher-Scholar Award. He also earned an American Association for the Advancement of Science Mentor Award and a John Simon Guggenheim Fellowship, which he spent at the Jet Propulsion Laboratory at the California Institute of Technology.

Joseph Francisco’s research is in the area of theoretical and experimental physical chemistry with a special interest in atmospheric chemistry. He has over 400 publications and has co-authored the textbook “Chemical Kinetics and Dynamics.” Francisco is a fellow of the American Physical Society, the American Association for the Advancement of Science and the American Academy of Arts and Sciences. From 2006 to 2008, he was president of the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE: <https://www.nobcche.org/>). He received a bachelor’s degree in chemistry at the University of Texas at Austin and a doctorate in chemical physics at the Massachusetts Institute of Technology. Please help us welcome Dr. Joseph Francisco as our next Dean!



Dr. Joseph S. Francisco, Dean of the College of Arts and Sciences and Cordes Chair with the Department of Chemistry

New Assistant Director of Instrumentation and Assistant Professor Join the Department

The Department of Chemistry is excited to introduce two of our newest employees, Dr. Beth Donovan and Dr. Stephen Morin.

Our new assistant director of instrumentation, Beth Donovan, comes to us with a wealth of research experience. She earned her B.S. in chemistry from the University of South Carolina, her Ph.D. from Oakland University, and she completed her post doc with Sandia National Laboratories and University of New Mexico. Dr. Donovan has held multiple industrial research and development positions including working on water-soluble polymers with Hercules, working on immunoassay development at Dade Behring, and working at DuPont on novel herbicides and pesticides.

She has also worked with academia with the University of Illinois’ Chicago Medical Center in the pathology laboratories analyzing clinical samples.

As assistant director of instrumentation with the UNL Department of Chemistry, her position is multifaceted. Donovan is primarily responsible for preparing and maintaining instrumentation for undergraduate use. She trains undergraduates how to use the analytical instruments in the Undergraduate Instrumentation Center (UIC) and Research Instrumentation Facility (RIF). One of Donovan’s primary goals has been to improve the undergraduate lab experience by developing and implementing changes to existing experiments. Donovan considers assisting undergraduate students with UIC instruments and their research projects to be one of the more interesting aspects of her job.



Dr. Beth Donovan

‘Donovan and Morin Join Department’ continued on page 20

Donovan and Morin Join Department, *continued from page 19*

"I chose to come to UNL to help improve students' laboratory experiences and ultimately help them be better-prepared for their careers after graduation."

In Donovan's spare time, she enjoys playing soccer, volleyball, jogging and exploring the outdoors. Enjoying a nonfiction book or listening to live music at small venues also ranks highly on her list.

The newest assistant professor to join the department would be another nature lover. Outside of lab you will often see Dr. Stephen Morin on his bike traveling to and from campus or recreationally on the weekend. On average, he logs about 140 miles per week on his cycle.

Dr. Morin just finished his postdoctoral position at Harvard University. Before that, Morin earned his Ph.D. at the University of Wisconsin-Madison and his B.S. at The University of Texas at Austin.

As an undergraduate, Morin conducted research under the direction of Professor Keith J. Stevenson on nitrogen-doped carbon nanofiber electrodes. This experience motivated Morin to pursue a career in research science. As a graduate student he studied under the direction of Professor Song Jin. His research and thesis, titled "Dislocation-Driven Synthesis and Bioinspired Assembly of Functional Nanomaterials"

Dr. Stephen Morin



focused on the rational synthesis and assembly of nanomaterials based on fundamental concepts of crystal nucleation and growth. For Morin's postdoctoral fellowship he studied under Professor George M. Whitesides at Harvard University. There Morin conducted research in the areas of soft robotics and adaptive materials.

As a student, Morin has an extensive publication record, three papers as an undergrad, thirteen as a graduate, and eight as a postdoc. This list includes two publications in the prestigious journal, *Science*. He also has filed four patents.

With so many opportunities open to him, we asked Morin what drew him to UNL.

"UNL is a forward-thinking university with a tremendous amount of momentum. UNL just joined an elite academic conference, the Big 10, which includes membership to the Committee on Institutional Cooperation. New centers and facilities, such as CB3 and NCMN, and most recently Nebraska Innovation Campus (NIC) are springing up all around campus. They represent UNL's commitment to excellence in research, and I wanted to be a part of that. It's really an exciting place to be right now. These indicators coupled with the College of Arts and Sciences' emphasis on growth in materials research made my decision to come to UNL easy."

As for his contribution to this forward-thinking momentum, Morin added, "I would like to create a nationally/internationally recognized, externally funded research group that increases the visibility of UNL Chemistry in the area of active soft/hard matter research. Achieving this goal will build upon the successes of the senior and junior faculty of this department whom I am very happy to be joining."

Morin's current research experience focuses on soft materials with reconfigurable chemical, structural, and physical properties. The micro-scale features of these materials are easily and rationally reconfigured using simple, macro-scale processes (e.g., mechanical deformation or thermal activation). These materials can be used to organize and manipulate micro/nanostructures on length scales commensurate with their size, even when large numbers of objects are involved. The dynamic properties (chemical, physical, and structural) of these systems are useful to applications such as soft sensing and electronics, and they will enable new methods of nano/micromaterial synthesis and new strategies for the fabrication of hierarchical hybrid structures. Active research projects include: (i) reconfigurable surface-chemical patterns and nanostructure arrays supported on soft, elastomeric polymers, (ii) reconfigurable microfluidic systems, and (iii) reconfigurable polymeric microstructures.

In addition to keeping up with his research and teaching, Morin has been busy establishing his newly designed research lab equipped with such notables as a 3D printer, an optical/fluorescence microscope, a plasma etcher, a bank of programmable convection ovens, an automated spin processor, a materials testing system from Instron®, and five fume hoods (including a floor-mounted unit), to name a few. He has also recruited six graduate students to his lab as well as two undergraduate researchers and a high school intern.

To say the least, he has been very busy. Surprising he has time to get out of the lab or classroom and enjoy his cycling with that schedule.

Alum John Schiel—Challenged to Do More, Learn More, Be More



Dr. John Schiel

Some of the best teachers out there are those who challenge and inspire students to do more, learn more, be more. Alumnus Dr. John Schiel (1999 B.S., 2009 Ph.D.) was inspired early as an undergraduate student to look into chemistry research. His professors could see he had the intellectual capacity to excel in this area. Through a number of conversations with department faculty, Schiel was convinced to pursue research opportunities in Hamilton Hall. After exploring

his options, Schiel became interested in Dr. David Hage's work and started working in his lab shortly thereafter. That experience turned out to be a great fit for Schiel which afforded him the opportunity to be published as an undergrad as well as hone his love of research.

"After completing my B.S. in chemistry and working for Dr. Hage as an undergraduate, I realized I still had much to learn from Dr. Hage and other professors at UNL," Schiel explains. "I visited a number of graduate schools, and in the end, there was just no place like Nebraska!"

As a graduate student, Schiel's faculty relationships would continue to blossom and inspire him over the years to become a better scientist. Dr. Schiel explains a fond pivotal moment in his graduate education with Dr. Jody Redepenning.

"I always particularly enjoyed the direct and insightful research discussions, classes, and teaching from Dr. Redepenning. During my first analytical chemistry division seminar, he asked me a very good question I hadn't thought of prior to the talk. I took a few moments to think, and delivered what I thought was a pretty decent answer. Dr. Redepenning leaned back in his chair, laughed a little, and said with a smile on his face, 'That was a great answer, completely wrong, but great anyway.' Having that type of open interaction and being able to have some fun made graduate school a great experience."

Of course, Dr. Redepenning went on to explain why Schiel was wrong, but the lessons he learned from interactions like those were priceless. With those experiences and others, he could see himself changing as a student, changing the way he learned, the way he thought, and asked questions.

"Inevitably throughout graduate school and beyond, a variety of scientific questions for which you may not have immediate answers will arise. These could be in the form of difficult homework assignments, research results, or formulating a plan toward achieving a new research goal. Challenges like these are also opportunities to grow as a scientist and are the purpose of a Ph.D. program. I think 'learning to learn' is a very big part of a scientific education, not necessarily attempting to know everything."

As with each successful graduate student, they eventually develop their own method for dealing with these learning and academic hurdles.

"In graduate school, I would work my way through a problem to the best of my ability by using cumulative knowledge, literature, and other sources of information. Those other sources of information come in the form of professors and classmates. Having scientific discussions and "bouncing" ideas off of one another is an excellent way to spur thinking and come up with the best plan forward. I remember many occasions sitting in front of the white board with Dr. Hage and fellow classmates deriving equations, etc. More often than not, we all left with a better understanding and plan forward, not to mention additional interesting research ideas."

Schiel continues, "I didn't (and still don't) always have the correct answer. However, a collaborative effort can always lead to a plan in pursuing the correct answer. There was a quote I ran across in graduate school (I think it was by Benjamin Disraeli) that says 'to be conscious that we are ignorant of the facts is a great step toward knowledge.'"

Today, Schiel uses those educational tools everyday as a research chemist at the National Institute of Standards and Technology (NIST).

"Training at UNL opened up many doors for me after graduate school," Schiel explains. "The program was set up in a way that gave a broad background in many aspects of fundamental chemistry and biochemistry. In addition to this solid core, the professors at UNL really emphasized learning how to learn as a critical aspect of obtaining a Ph.D. The solid core of classroom and research experience gave me the opportunity to secure my current position, but the philosophical training about how to approach a new problem allowed me to convert into an entirely new area of research."

'Schiel' continued on page 22

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Alum John Schiel, *continued from page 21*

Schiel is currently working on the NIST Bio-manufacturing Program which is developing a suite of fundamental measurement science standards and reference data to enable more accurate and confident characterization of key attributes of protein drugs that are directly linked to their safety and efficacy. A critical component in achieving these goals is the production of a widely available reference material useful for establishing instrument performance and variability in analytical test methods. Such a system suitability tool is expected to more firmly underpin regulatory decisions and facilitate the development of originator and follow-on biologics, thereby allowing U.S. citizens affordable access to these innovative and life-saving medicines.

Specifically, Schiel has been the project coordinator developing a recombinant IgG 1κ monoclonal antibody as a national reference material. This project is intended for a variety of uses including, but not necessarily limited to: system suitability tests, establishing method or instrument performance and variability, comparing changing analytical test methods, assisting in method validation, etc. These national reference materials and standards are designed to support the bio-manufacturing industry in addition to such stakeholders as the biopharmaceutical industry, academia, regulatory authorities, and other standards organizations. Schiel's group specifically focuses on mass spectrometry-based physicochemical characterization of therapeutic proteins.

This job has been a great fit for Schiel's skills and is one he truly loves.

"I am very excited to be working for the federal government. NIST is a place that has clear goals and direct applicability. I am able to work on a daily basis with regulatory agencies and biopharmaceutical companies to solve technical issues and foster development of life saving medicines."

Schiel has made quite the impact in the scientific community since he graduated in 2009. Most recently this year, he was awarded the Early Achiever Award from the College of Arts and Sciences and presented the Alumni Early Achiever Award Lecture at Hamilton Hall this spring. To see his colloquium in its entirety check out the following link: <http://www.youtube.com/watch?v=cG01h0jXkz8&feature=youtu.be>

In the DC area, they do have excellent outdoor activities such as backpacking, hiking, biking, snowboarding and skiing that Schiel enjoys in his spare time but for a good football game, Schiel remains true to the one and only Big Red Machine!

Avery Hall Time Capsule, *continued from page 13*

"Opening up this time capsule that has been waiting for us for 98 years is just a fascinating event," James Linder said. "And the story of Rachel Lloyd is equally amazing. She was the university's second professor of chemistry at a time when there were not many women chemists. And the significance of her research into the beet industry set the framework for early Nebraska commercialization.

"Encouraging faculty to work with industry and create products is what the University of Nebraska is trying to do today. Rachel Lloyd was doing this more than 100 years ago."

When Avery Hall opened in 1916, it was called the Chemistry Laboratory and home to the University of Nebraska's Department of Chemistry.

Chris Krivda of Krivda and Son said the project will be completed with the placement of a new cornerstone later this summer.

The contents of the time capsule will remain secret until they are presented at the October celebration of Lloyd's historic plaque.

"It's going to be a difficult wait, but I think we can do it," Griep said. "It will be exciting to incorporate these items into the celebration."

For more information on this project go to www.youtube.com/watch?v=toboelOZJQ0

— Troy Fedderson, UNL University Communications



The Avery Hall cornerstone time capsule was removed on May 12.

In Remembrance

Dr. Gordon A. Gallup

The Department of Chemistry regrets to inform you of the passing of a dear friend to the department, Gordon A. Gallup of Lincoln, died on March 26, 2014. He was born March 9, 1927 in St. Louis, MO, to Merle and Eudora Gallup. He was a WWII Navy veteran. Gallup received his Ph.D. in chemistry from the University of Kansas in 1953 and did post-doctoral research at Purdue University. In 1955 he came to UNL, becoming full professor in 1964. In 1993 he retired from teaching and since then has spent time as a courtesy research professor with the Department of Physics and Astronomy at UNL.

His research interests over the years include infrared spectroscopy and molecule vibrations, theory of molecular electronic structure, valence bond theory, electron scattering from atoms and molecules, and dissociative electron attachment. He has had over 130 articles published in 10-15 chemistry and physics journals, as well as articles in edited compendia and review books.

Gallup is survived by his wife, Grace (Gay) of Lincoln; daughter, Stephanie (Nels) Quinn, Rowlett, Texas; daughter-in-law, Linda Gallup, Austin, Texas and four grandchildren.

Dr. Robert S Marianelli

Another great loss to the department was the passing of a former faculty member, colleague, mentor, and advisor to the department, Dr. Robert S Marianelli, Ph.D. Marianelli was from Columbia, Maryland and died December 22, 2013, at the age of 72 after a struggle with ALS (Lou Gehrig's disease).

Marianelli earned his undergraduate degree in mathematics at the University of Delaware and his Ph.D. in chemistry at University of California-Berkley. He completed his degree in three years because he was one of the students that the university pushed through during the Sputnik era. After graduating in 1966, he joined the chemistry department at the University of Nebraska-Lincoln (UNL). There he taught for 12 years and was granted tenure. Although he enjoyed teaching and research, he said that he had a hard time asking for money to support his research projects.

In 1977 he was presented with an opportunity to take a leave of absence from the university and work for the Energy Research and Development Administration (ERDA) which was about to become the Department of Energy (DOE). Marianelli felt he could accomplish more by managing science than by performing science. He took the two-year leave of absence and then in 1979 accepted a permanent position with DOE.

Marianelli worked 20 years with the DOE and during that time he served 8 years as a program manager, a short stint as a branch chief, and 12 years as director of the Chemical Sciences Division. He was especially proud that he helped identify and foster many extremely bright scientists, six of whom went on to earn Nobel Prizes, perhaps the top honor a scientist can receive. The six Nobel Laureates were Yuan Lee, Dick Schrock, Bob Grubbs, Sherwood Rowland, Donald Cram, and Richard Smalley. He had said that he did not care to be in the limelight but only wanted to see things accomplished and felt he could foresee who had real talent and creativity and could then help provide funding necessary to continue their research.

In addition, Marianelli helped develop, plan, and manage several successful DOE facilities. For example, he assisted with planning the creation of the Environmental Molecular Science Laboratory at the Pacific Northwest National Lab in Richland, Washington which cost \$230 million to build, he oversaw the operations of the Combustion Research facility at Sandia Livermore, and the Stanford Synchrotron Radiation Lab, both in California and partnered with the National Science Foundation (NSF) to fund and develop the Environmental Molecular Science Institutes. He received unexpected funding of \$3.5 million to start an advanced battery program. The program contributed significantly to some of the science that is important today in advanced batteries and fuel cells.

In 1998, during the Clinton Administration, Marianelli took a position as the assistant director for Physical Sciences & Engineering with the Office of Science and Technology Policy (OSTP), which is part of the Executive Office of the President.

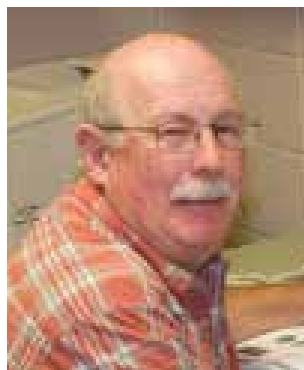
'In Remembrance' continued on page 24



Dr. Gordon A. Gallup



Dr. Robert S. Marianelli



Dr. William Patrick Henry



Dr. Dexter B. Sharp

In Remembrance, continued from page 23

After retiring from the Government, Marianelli continued to consult with the Pacific Northwest National Laboratory, Battelle, and other programs within the DOE Office of Science.

Although he left UNL in 1977, he continued to make a difference for the university and its students. He served on the Industrial Advisory Board for the UNL Department of Chemistry along with 20 other board members. One of his most prized accomplishments as a board member was the scholarship fund he helped develop. When a prior colleague passed away, Marianelli said, "I could do what others do and just make out a check to a memorial fund but that money will never reach the endowment level. Then I came up with the idea of a Chemistry Faculty Remembrance Fund." The concept was to honor faculty who had spent most of their entire career with UNL's Department of Chemistry and to provide a scholarship to a deserving undergraduate or graduate student with the spendable income generated by this fund. He was pleased that the fund reached the endowment level and several scholarships have since been awarded.

He is survived by his wife Kathy Marianelli and his siblings; Maria Kwiatkowski and John Marianelli from Delaware and Ann Clawson from Naperville, Illinois.

Dr. William Patrick Henry

Alumnus Dr. William Patrick Henry, 56, passed away on February 12, 2014 at his residence in Starkville, MS. "Doc", as he was called by his students, received his undergraduate degree in chemistry from the University of Notre Dame and his Ph.D. from the University of Nebraska-Lincoln. He did postgraduate work in chemistry at Dartmouth University and Wayne State University before becoming a member of the chemistry department at Mississippi State University in 1988. His major emphasis was in Inorganic Chemistry. He was an active researcher and published author in Inorganic Chemistry.

He was very involved with MSU activities. He was a former player and coach for the MSU Rugby team, a supporter and a member of the booster club for the MSU women's basketball team, and an avid golfer and a member of the faculty golf league.

He is survived by his wife, Jackie Edwards Henry of Starkville, MS; sister, Eileen Henry Mahon (Jack) of Glenview, IL and their children, Patrick, Jack, Jr. and Grace Mahon; brother, Thomas Henry (Sarah) of South Bend, Indiana, and their child, Katie Henry.

Dr. Dexter B. Sharp

Alumnus Dexter B. Sharp died March 31, 2014 at St. Luke's Hospice House in Kansas City, Missouri.

Dexter was born in Chicago, Illinois, on Flag Day, June 14, 1919, the second of three sons born to Mahlon and Olive Sharp. While an active student at New Trier High School he was a gymnast, cheerleader, diver, and sang the part of Nanki-Poo in the Gilbert and Sullivan light opera *The Mikado*. He attended Carleton College earning a B.A. in chemistry, and the University of Nebraska, where he earned his Ph.D. in chemistry (1945) and met and married Peggy Person, with whom he had three daughters.

Upon graduation, Dexter worked at E.I. DuPont de Nemours in Wilmington, Delaware for one year before returning to academia to complete post-doctoral work at the University of Minnesota. He then joined the faculty at Kansas State University until 1951, when he began work at Monsanto, first in Dayton, Ohio, and then in St. Louis, Missouri. Dexter worked 35 years at Monsanto, rising to the position of research director in the Agrichemicals Division, where he directed management of the studies to enable registration of the then-new herbicidal products, Lasso® and Roundup®. Dexter was also an avid rock hound for many years and a dedicated ice cream eater throughout his life.

It is hard to keep a good scientist down, so in retirement Dexter volunteered as a citizen scientist for two programs on monarch butterflies, the Monarch Larva Monitoring Program and Monarch Watch, gathering statistics on the host milkweed plants, eggs, and larvae near his northern Wisconsin summer home, and tagging many adults in the fall. He was always very gratified to receive a report when any of his tagged butterflies successfully journeyed the 1000+ miles to the wintering grounds in the mountains of Mexico.

Dexter was a loving husband and excellent caregiver to his wife of 53 years, Peggy E. Sharp, through her final illness and death in 1999. He was also predeceased by his brother Mahlon "Ripp" Sharp, Jr. and sister-in-law Jean Sharp. Survivors include his brother James and sister-in-law Kaye Sharp of Carlsbad, California; his daughters Lynn Sharp (Milwaukie, Oregon), Judy Sharp and husband Kent Johnson (Overland Park, Kansas), and Jan Sharp and husband Brian Bowman (Minneapolis, Minnesota); grandchildren Christina Beard and Benjamin and Daniel Johnson.

Dexter was known for his limericks, so we offer this tribute:

There once was a chemist from Chi-town
Who synthesized chemical compounds
To aid entomology
Without an apology
He tagged adult monarchs when southbound.

Chemistry Faculty Remembrance Fund

The UNL Chemistry Faculty Remembrance Fund was created to establish an endowed fund for those wanting to honor professors who impacted their lives.


Each year, an award will be made in honor of a former faculty member to a deserving undergraduate or graduate student with the spendable income generated by this fund.

If you would like to give to this fund, the Chemistry Excellence Fund, or establish a fund in someone's memory or honor please call **1-800-432-3216** or visit <https://nufoundation.org/SSLPage.aspx?pid=2078&chid=25> for more information.

Reconnect...

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 Follow the UNL Department of Chemistry on Twitter! Keep up-to-date on department awards, events, and research by following @UNLChemistry on Twitter.

in Join the University of Nebraska–Lincoln Chemistry Alumni group on LinkedIn and reconnect with professors, colleagues, classmates, and friends! The Department of Chemistry Alumni group will help you expand and strengthen your professional networks while keeping you posted on all of the happenings in the department.

Chemistry Alumni Website:

<http://chem.unl.edu/alumni/index.shtml>

Offering:

Class Listings:

Current listings of Ph.D., M.S., and B.S./B.A. graduates.

Connections:

Career Networking Services provide links to job listings, help with chemistry job searches, and provide opportunities to use Chemistry Facebook Group and LinkedIn for social and professional networking. Update your contact information by sending to alumni@huskeralum.org.

Events/News:

Keep up with current events, past happenings, alumni newsletter, alumni stories.

Support the Department:

Learn how to support the UNL Department of Chemistry through a variety of ways.

Connect to Job Opportunities with Husker Hire Link

Husker Hire Link is UNL's free online service that connects UNL students and alumni with employers. The site allows students and alumni to post and send resumes; search jobs, internships, and employers; request on-campus interviews; and stay updated on career opportunities. Last year, more than 2,200 employers from across the country in a wide variety of career areas used Husker Hire Link to post more than 8,000 jobs and internships.

For more information visit the Husker Hire Link at <http://www.unl.edu/careers/hhl>.



Where are they now?

Attention alumni! We want to know where you are and what you're doing! Please take a moment to answer the following questions and return your responses by mail to:

University of Nebraska–Lincoln
Department of Chemistry
515A Hamilton Hall
Lincoln, NE 68588-0304

Or, email your responses to: kerry.vondrak@unl.edu

Name: _____

Degree: _____

Year Earned: _____

UNL Advisor: _____

Email: _____

Current and past career positions: _____

Please let us know of any significant events in your life and/or career since leaving the University of Nebraska–Lincoln. Also, please feel free to send any photos and/or recollections of your time here at UNL!



Update Contact Information:

Alumni members, now you can update your contact information by visiting http://chemweb.unl.edu/registrationforms/?wpgform_qv=alumni-registration.

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