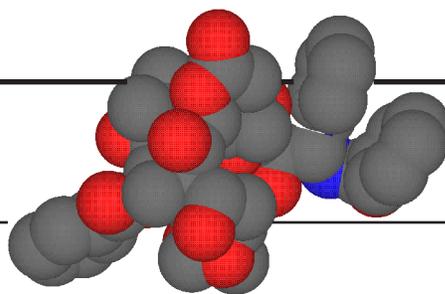


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MISSOURI STATE UNIVERSITY

Spring, 2010

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Alumni Spotlight

Mr. Art Hurtado is a seasoned executive with over 35 years of experience in management and technical positions in both the commercial and government sectors. He is Chairman and Chief Executive Officer of Invertix Corporation, a technology company that delivers communications and analytics solutions to the intelligence, surveillance and reconnaissance (ISR), Cyber and R&D sectors of government and defense. He has presided over the stellar growth of the company during recent challenging economic years. With its headquarters in McLean, Virginia, Invertix also has an engineering center of excellence in Las Cruces, New Mexico, an office in Boston dedicated to ISR sensor and analytics technologies, and a center in Springfield, Virginia dedicated to Cyber and Cloud Computing research and development. Prior to co-founding Invertix in 1999, Mr. Hurtado served as vice president for advanced systems with Microelectronics Computer Corporation and then as senior vice president, telecommunications, for CACI, Inc. He also served as the Chief Scientist during the early stages of development of the Public Safety Wireless Network.



Mr. Hurtado is a native of Taos, New Mexico and the son of Southern Baptist Missionaries to the Spanish speaking people in Northern New Mexico. He was selected as the most outstanding, distinguished military graduate from Missouri State University and was commissioned a second lieutenant in the Infantry in 1969. In 1971 he was reassigned to Military Intelligence. He served for 26 years with distinction as an officer in the U.S. Army, where he commanded at various tactical levels overseas and in combat. He also served in the Army's Acquisition Corps where he was board selected to manage the development and fielding of a number of significant communications and intelligence systems.

While with the Strategic Defense Initiative Organization he headed up the team that developed the High Endoatmospheric Defense Interceptor. He also played prominently in developing the architecture for the Theater High Altitude Area Defense (THAAD) missile. As the first director, he founded the Joint Precision Strike Demonstration Office, and he served as chairman for the Joint Strategic-Tactical Intelligence Dissemination Panel. Among his medals, he holds the Defense Superior Service Medal, Bronze Star, Legion of Merit with oak leaf cluster, Combat Infantryman's Badge, Parachute Badge, and Purple Heart. Mr. Hurtado worked to establish an academic-industry consortium to address homeland security issues post 9/11 between Missouri State University, New Mexico State University and New Mexico Technology Institute.

Mr. Hurtado and his wife Dianna have been strong supporters of various programs in higher education. Among their funding support activities for various universities, they have established scholarships at New Mexico State University (College of Engineering), Missouri State University (College of Natural and Applied Sciences), and Virginia Commonwealth University (School of Social Work).

Mr. Hurtado received a BS in Chemistry from Missouri State University in 1969 and a MSEE from New Mexico State University. He is a certified Project Management Professional, a member of Eta Kappa Nu, the Institute of Electrical and Electronics Engineers, and a distinguished member of the Sociedad de Ingenieros. His patent filings include work in advanced spatial antenna modulation.

He is currently a member of the Board of Visitors for Virginia Commonwealth University, and he is currently serving as the President of the Board of Trustees for the VCU College of Engineering. He was a charter member in the formation of the Advisory Board for New Mexico State University's College of Engineering, and the Klipsch Electrical and Computer Engineering Academy in 1991. He continues to serve on both. In 2003 he guided the formation of the Advisory Board for the Department of Chemistry, MSU, on which he currently serves. He is also a member of the Advisory Board for the School of Information Technology and Engineering, George Mason University.

Mr. Hurtado is an active member of the Potomac Officer's Club and a frequent speaker in various industry and academic forums. He is currently pursuing a Masters of Theology at Capital Bible Seminary in Lanham, MD. His wife, Dianna, a licensed clinical psychotherapist, holds a MSW from VCU. In 1971 they adopted Virginia as their home and currently reside in Fairfax.

NOTE FROM THE HEAD - *Dr. Alan Schick*



I have truly enjoyed my first year at MSU. I find that the faculty and staff function rather well as a team and manage to accomplish a broad range of activities that could not possibly be achieved by any smaller of a group. Our majors strike me as being motivated, focused, and determined, and once again we had a great group of award winners at our annual banquet.

As you look through this issue of M&M you will note many accomplishments of our faculty, students, and alumni. Several publications are already in print from our department in 2010, and a number of others have been accepted; our students showed well at the 1st Annual CNAS Undergraduate Research Day; alumni are moving up all around the region and the country; and our faculty continue to provide international exposure for our department. Dr. Richter is coming up to the second of at least three consecutive summers of conference invitations abroad (China in 2009, Australia in 2010, and very likely back to China in 2011), and "Dr. G" just got back from a very unique and productive sabbatical in Germany.

On a more somber note, you may be seeing and hearing news of Missouri's budget situation and its effect on higher education in the state, particularly regarding MSU. At this point the university is looking at a modest 5.1% budget reduction for 2010-11, which is effectively being absorbed by the university and the

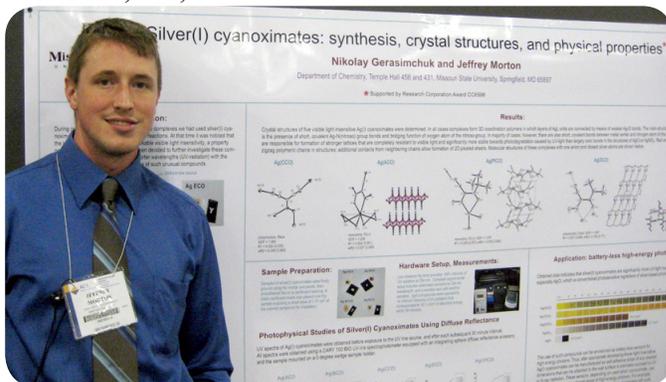
college by cuts in general programs and by encouraging retirements, none of which are coming from Chemistry. Thus, through the next academic year our department is fortuitously evading any significant budget reductions. Predictions for 2011-12, however, indicate cuts in higher education could be as much as an additional 15%. With a little more "belt tightening" at the university level and a few more retirements, this cut might translate to about 11% to our college. If that happens, no department will remain untouched. Starting in the fall, more definitive budget values will begin to develop that may very well require us to reexamine how we do business, so keep your fingers crossed.

FACULTY NEWS

Richard Biagioni, Chuck Rovey, and Doug Gouzie received a grant from The U.S. Department of Energy, NETL, for 2009, for the project entitled, "Monitoring and Numerical Modeling of Shallow CO₂ Injection," Greene County, Missouri, in the amount of \$293,117.

Mark M. Richter co-authored a paper with Niall S. Pennington and Brenden Carlson entitled, "Efficient Electrogenerated chemiluminescence from Osmium(II) Polypyridine Systems Containing Tetraphenylarsine or Diphenylphosphine Ligands," *Dalton Trans.*, 2010, **39**, 1586–1590. He received a Missouri State University Faculty Research Grant for Spring, 2010, for the project "Enhancing Light-Emission Using Carbon Nanotubes," in the amount of \$5,696.

Nikolay Gerasimchuk co-authored a paper with A. N. Esaulenko, K. N. Dalley and C. Moore entitled, "2-Cyano-2-isonitroso Acetamide and its Ag(I) Complexes. Silver(I) Cyanoximate as a Non-electric Gas Sensor," *Dalton Transactions*, 2010, **39**, p.749-764. Jeff Morton presented, "Silver(I) Cyanoximates: Synthesis, Crystal Structures, and Physical Properties," co-authored with N. Gerasimchuk, at the national ACS meeting in San Francisco, CA, in March 2010.



Jeffrey Morton

Reza Herati received a Missouri State University Summer Faculty Fellowship for 2010 for the project,

“Synthesis of Linear Poly(ethylene glycol)-block-Poly(ether-sulfide) Dendritic Polymers and Their Applications in Drug Delivery,” in the amount of \$6000.

Adam Wanekaya was co-author on the following publications: (1) S. Tolani, A. Mugweru, M. Craig, and A. K. Wanekaya, “Rapid and Efficient Removal of Heavy Metal Ions from Aqueous Media Using Cysteine-modified Polymer Nanowires,” *Journal of Applied Polymer Science*, 2010, **116**, 308-313. (2) N. Havens, D. Kim, M. Luna, A. Mugweru, and A. K. Wanekaya, “Redox Polymer Covalently Modified Multiwalled Carbon Nanotube Based Sensors for Sensitive Acetaminophen and Ascorbic Acid Detection,” *Electrochimica Acta*, 2010, **55**, 2186-2190.

**CHEMISTRY PROFESSOR
TO PRESENT KEYNOTE
LECTURE AT THE 13TH
ROYAL AUSTRALIAN
CHEMICAL INSTITUTE
(RACI) CONVENTION IN
MELBOURNE, AUSTRALIA**



Dr. Mark Richter has been invited to present a keynote lecture at the 13th Royal Chemical Institute’s (RACI) Convention. The conference will be held July 4-8, 2010 in Melbourne, Australia. The theme of this conference is Measurement and Sustainability. Dr. Richter is actively involved in chemical research in the field of light emitting systems. He will be discussing ongoing work in his group to improve light emission from chemical systems, and the use of these systems to detect various chemicals of interest (e.g., pollutants and molecules important in medical diagnostics).

Dr. Richter has also been invited to present at the 21st Biennial Conference on Chemical Education (BCCE) Conference. The meeting will be held August 1-5, 2010 at the University of North Texas in Denton. He will be presenting in the “Out of the Box: Teaching Chemistry with Case Studies and Applications” symposium. Dr. Richter attended a workshop in 2005 on using Case Studies to improve student learning, and has incorporated Case Studies into both lower and upper division chemistry courses.

**SABBATICAL IN EUROPE: WORK AND LIFE
IN HEIDELBERG, GERMANY--By Dr. Nikolay
Gerasimchuk**

From August 4 until December 21 of 2009, I lived and worked in the small German university town of Heidelberg with a population of ~100,000 and located on the Neckar River in a picturesque valley between



mountains in Baden-Wurtemberg land. Here is the oldest university in Europe: it was founded in 1386. The university’s logo is very symbolic Semper Apetus! - The book of knowledge is always open! It is one of the best German universities for all disciplines and programs, and actually has the best Physics Department in the country.

Brilliant minds worked here: August Kekule (theory of valence of chemical elements and carbon in particular; origin of the cyclic nature of benzene), Robert Bunzen (invention of the burner, discovery of Cs and Rb), Victor Meyer (the Meyer reaction), Emil Knövenagel (Knevenagel’s condensations), Theodor Curcius (first preparation of semiconductor grade pure silicon), Leopold Gmelin (first classification of inorganic compounds and minerals – first handbook on a subject!). The Chemistry Department has three units and fields of specialization--inorganic, organic, physical and colloidal chemistry. The teaching process, such as general lectures and seminars, are carried out in a small separate building. All teaching labs and research laboratories are located in three adjacent, spacious buildings, which are Inorganic, Organic and Physical Chemistry Institutes; Biochemistry belongs to the Biology Department. The Inorganic Chemistry Institute has four active professors and three emeritus professors, one of whom still regularly conducts research. Professors teach large classes in Inorganic Chemistry--General Chemistry, Inorganic Chemistry, Organometallic Chemistry, Qualitative Analytical Chemistry, Quantitative Analytical Chemistry, Bioinorganic Chemistry, Spectroscopic Methods, Synthesis and Characterization of Inorganic and Organometallic Compounds. Every professor has a secretary and two to three habilitants (Research Professors) who after their PhD work in the area of the professor’s interest and provide significant teaching assistance to him. They also recruit/train/supervise undergraduate and graduate PhD students. Without habilitants all the professors’ work in teaching and research would simply collapse. All habilitants work three–five years with their

chosen professor/adviser on a research project of mutual interest and eventually present their Doctor of Science Dissertation. The process of its internal and external analysis/confirmation takes about one year, after which habilitants are looking for permanent positions themselves.

I worked in the Research Group of Professor Roald Krämer, whom I met during my

first visit to Heidelberg for the International Conference on Coordination Chemistry (ICCC-35) the summer of 2002. He is a known expert in the field of Bioinorganic Chemistry of DNA and RNA, metalloproteins. Today he is a Director of the Inorganic Chemistry Institute. The research group had six spacious labs with many undergraduate and Ph.D. students. My immediate host in Krämer's research group was the Group Leader Dr. Andrew Mokhir. I have known him since 1990 when he had just entered as an undergraduate student at Kiev State University in Ukraine. I was his Inorganic Chemistry teacher at that time, and he later joined my research group. We also worked together in the lab of Prof. Kenton Rodgers at North Dakota State University from 1997-1998. Dr. Mokhir was solely responsible for my accommodation, laboratory research space and related spending. He gave me a small, but well equipped synthetic research laboratory in which I worked alone.

While still here at Missouri State, we extensively discussed a mutually interesting research project. We investigated three conceptual ideas: 1) the use of the synthetic 14-mer cyclic DNA molecules as templates for possible crystallization of initially centrosymmetric crystals into chiral/non centrosymmetric space groups; 2) study of interactions of heterocyclic cyanoximes and their Pt-complexes with the DNA – 15-mer double-stranded oligomers and 25/35 double-/single-stranded DNA; 3) preparation of a series of highly colored low-spin Fe(II) tris-cyanoximates for their comprehensive spectroscopic and Mössbauer effect characterization. In July of 2009 prior to my departure for Germany, I sent several parcels with initial compounds and cyanoxime ligands. While waiting for the compounds to arrive, I wrote and submitted

two papers for publication (both already published). My DNA experiments, despite the effort and significant

cost (~€ 5,000 per DNA sample), unfortunately did not produce the expected results. Nevertheless, I have learned firsthand how to work with DNA during my Pt-binding and other studies, and this experience definitely will be very useful for the planned continuation of related work here. The third project

was a complete success: ten new compounds were made, characterized and submitted for ⁵⁷Fe Mössbauer studies at the Laboratory of Nuclear Chemistry of Budapest University. I expect this work to be ready for publication soon. Besides my synthetic work in Heidelberg I have established good personal contact with local crystallographers – Dr. Frank Röminger and Dr. Huber Wadepohl. I learned quite a bit during our long conversations on the topic of disorder and using restraints during the final stages of crystal structure refinements. This knowledge is very helpful now since I encounter many disordered structures these days while working on our APEX 2 diffractometer.

During my sabbatical I had three unforgettable lecture tours--Poland (Wroclaw, two lectures), Hungary (Szeged, Pecs, Debrecen, Budapest – four lectures), and England (Hull, one lecture)--about my research that was carried out at MSU.

ALUMNUS ON THE MOVE

(UT-Dallas Press Release)

Dr. Dennis W. Smith Jr., has joined the University of Texas at Dallas as professor and holder of the Robert A. Welch Chair in Chemistry. The Welch Foundation is a philanthropic organization that supports fundamental chemical research in Texas.

Dr. Smith is an expert on fluorine-containing polymers and renewable-resource and biodegradable materials. The materials include long-chain macromolecules that make up films, coatings, rubber, membranes, plastics and other materials. Some have been tested for use on future Space



Shuttle missions and in hydrogen-powered fuel cell vehicles. His research in micro-optics—using light rather than electricity to communicate and process energy—has the potential to double storage space on DVDs and lighten the weight of military aircraft.

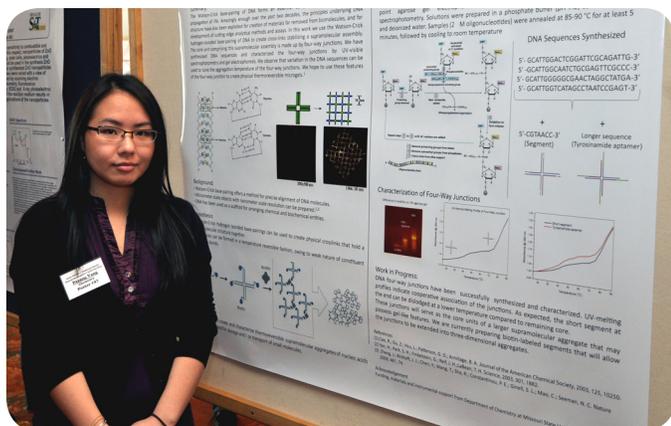
Before coming to UTD, Dr. Smith was professor of chemistry and material science and engineering at Clemson University. Prior to his academic career, he was a senior research chemist and a project leader with The Dow Chemical Company.

Dr. Smith co-founded Tetramer Technologies, LLC, which employs 25 chemists and engineers in South Carolina. He is listed as co-inventor on 14 U.S. patents, six of which are under commercial license. His publications include 100 refereed papers (published or in press) and two book editorships.

Dr. Smith received a BS in chemistry and mathematics from Missouri State University in 1988 and a PhD in chemistry from the University of Florida in 1992.

CNAS UNDERGRADUATE RESEARCH DAY

Within the Chemistry Division, Melissa Hayes received the 1st Place award in the amount of \$100, and Ryan Spidle received the 2nd Place award in the amount of \$50.



Pazong Vang

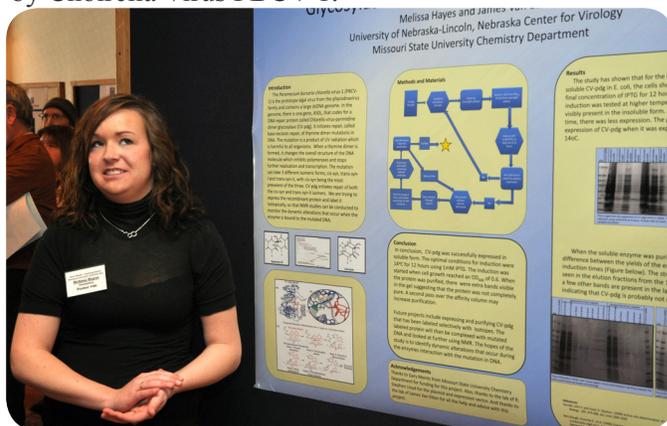
Ashley Egan, **Pazong Vang**, Bhaskar Datta, “Thermoreversible Association of Nucleic Acids into Supramolecular Aggregates.”

Amos Hale, Gary Meints, “Investigation of the Function of DNA Base Repair Proteins Using Solid-State 2H NMR.”

J. Mark Hobbs, Niral Patel, Daniel Kim and Adam Wanekaya, “Carbon Nanotube-based Glucose Biosensor for the Undergraduate Laboratory.”

Ryan Spidle, Charles C. Chusuei, Kartik Ghosh, Robert DeLong and Adam Wanekaya, “Zinc Oxide Nanoparticles: Hydrothermal Synthesis and Characterization.”

Melissa N. Hayes, Gary Meints, “DNA Repair Protein Expression: Pyrimidine Dimer Glycosylase Coded by Cholrella Virus PBCV-1.”



Melissa Hayes

FALL 2009 GRADUATES

BS Degree:



- Varsin Amin
- Ross Blackshears
- John Bledsoe
- Daniel Brown
- Justin Harper
- Gary Herron

- Matthew Keene
- Kanako Kuramochi
- Chad Pempiller
- Stephannie Taggart
- Emily Wilson

ALUMNI NEWS

Lisa Calvin Blue (BS ‘98; MS ‘02) has moved back to Lexington, Kentucky, to run a start-up company. She is Director of Development for Merloc, LLC. She will be working to begin industrial-scale production and sales of a class of metal, chelation compounds with applications in drinking water treatment and environmental remediation (acid mine drainage, coal-fired power plants, lead battery recycling effluents and the like).

Michael Bollinger (BS ‘76), Masters of Public Health in Environmental and Occupational Health from St. Louis University. He presently holds the position of Principal Environmental Scientist at Ameren in St. Louis.

Lance Christie (BS ‘96) is living in Nevada, Missouri, and is a Sr. Process/Product Engineer with 3M. He previously lived in St. Louis, Missouri, and completed an MBA at Washington University while there. In addition to his position at 3M, Lance has three children and also teaches at Crowder College.

Joseph Ellsworth (BS ‘04) is currently working on a law degree at Oklahoma City University School of Law and will graduate in Spring, 2011. He also holds a PhD in Inorganic Chemistry from the University of South Carolina.