Letter from the Dean

Spring 2012 was a time of change in the College of Natural Sciences and Mathematics. At the beginning of March, former Dean Steve Runge was appointed as interim Provost and Vice-President for Academic Affairs. I moved from my position as Physics Chair to serve as interim Dean, Ginny Adams is serving as interim Associate Dean, and Carl Frederickson has moved from his position as Associate Dean to serve as interim Chair of Physics.

The year has been a good year. College faculty won all three of the 2012 Faculty Excellence Awards. The awards were presented by Provost Runge who is pictured with each award winner.

Dr. David Dussourd, professor of biology, Dr. Weijiu Liu, associate professor of mathematics, and Dr. Debra Burris, associate professor of physics and astronomy were recognized during the annual Employee Appreciation Reception on April 25.

Dussourd was presented the Teaching Excellence Award. Dussourd has taken on the responsibility of preparing his students, as he puts it, "not just to fill test tubes, but to tackle everything from cloning to global warming."

One of Dussourd's goals in teaching science is to help students acquire the ability and confidence to do science, not just learn the results of science. He has been instrumental in developing a UCA insect collection that currently contains more than 2000 specimens.

"I am grateful for my gifted colleagues who have guided me and for my wonderful students who inspire me with their curiosity and dedication," Dussourd said. "I am lucky to have a job where every day I can help others. Not everyone is so fortunate."
Liu received the Research, Scholarship and Creative Activity Award.

Liu’s research interests are in the area of Mathematical Biology and in Control Theory with a focus on Feedback Stabilization. He has developed models for blood glucose regulation and intercellular calcium homeostasis in living organisms. Liu has been involved with both undergraduate and graduate students during his time at UCA.

"It is a big recognition for my research work I have done at UCA,” Liu said about the award. “It is also a big encouragement for me to continue to do my best to serve my university in teaching, research and services.”

Burris was awarded the Public Service Award.

Burris visits three different gifted and talented classes at Atkins Middle School every week, and is a co-sponsor of Middle School Naturalists Club and Point Remove Stream team. More than $3,000 in grants has been secured by Burris' work to purchase equipment and supplies for the Atkins Middle School, and was co-developer of two AGATE Curriculum award-winning programs for 6th grad GT students.
On January 26, 2012, STEM Residential College students conducted a science night at the Jim Stone Elementary School in Conway. Science night is an opportunity for school children and their families to participate in a broad range of scientific activities led by students. These activities aim to spark interest in science by exposing children to the importance of science in our communities, the enjoyment and exploration found in science careers, and simple scientific concepts. Activities ranged from acid/base chemistry to principles of aerodynamics, from anatomy to magnetic fluids, from moments of inertia to biology, as well as other exciting topics.

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(STEM Science Night continued) Science nights have been very well received every time STEM has conducted them. About twenty college students participated at Jim Stone that night, orchestrating the event for around thirty elementary-aged children and their families!

“As an active student of the STEM Residential College, I look forward to science nights more than any other STEM community activity. It is exciting to get to use what I have learned at college to inspire science interest in the community. But perhaps more than that, I enjoy seeing the faces of the kids and adults who—many for the first time—see a cool experiment or understand something new about our scientific world, said Ryan Rogers.”
On April 3rd, the College of Science and Mathematics had a fantastic show at St. Joseph School in Conway. Over 300 children of ages preschool to high school participated in the extremely diverse set of hands-on science, computer science, and math exercises. Graduate and undergraduate students, as well as faculty, contributed time and effort in making this the most extensive science night this year!
Recently, Dr. Bill Taylor in the UCA Chemistry department published a paper in the *Journal of Physical Chemistry, A*. The paper was co-authored by three UCA undergraduates (Li-Chen Chen, Kendall Fancher, and Ashley Hicks) and one UCA alumnus (Cullen Matthews). The paper, entitled “Near Thermal Reactions of Au($^1S, ^3D$) with CH$_3$X (X=F, Cl)”, is the result of a summer’s worth of research by Chen, Fancher, and Hicks that built on previous research done by Matthews.

In the work described in the paper, Dr. Taylor and his research students examine the reactions of gold ions with CH$_3$F and CH$_3$Cl with the goal of identifying products arising from both ground and excited state metal ions. Product identification is accomplished through a variety of methods, including mass spectral analysis, and an evaluation of the energetic and quantum mechanical requirements for reaction from each gold state.

These experiments revealed that reaction of ground state gold ions with both molecular substrates yields an HX elimination product (AuCH$_2^+$) and an association product (Au$^+$CH$_3$X), where X=Cl, F. In contrast, the dominant product of reaction of excited state gold is CH$_2$X$. Taylor and his students also explored the kinetics of these reactions and observed that CH$_3$Cl reacts much more efficiently than CH$_3$F. The results of this study have provided experimental verification for previously proposed theoretical ideas, and are consistent with similar reactions of gold ions in other reactive environments.
In February 2012, Dr. Yu Sun from Computer Science Dept., and her student, published a paper in The Institution of Engineering and Technology (IET) Image Processing. Processing in the world. The student author Jin Yang, co-advised by Dr. Sun, is a Ph.D. student at the University of Electronic Science and Engineering Technology of China. In this research, they propose a novel joint H.264/SVC-MIMO rate control (RC) scheme algorithm for video compression and transmission over MIMO systems. Experimental results demonstrate that their proposed algorithm achieves accurate bitrate control, reduce frame skipping, decrease PSNR fluctuation; thereby, improving overall video quality for MIMO wireless video transmissions.


COMPUTER SCIENCE

Students Recognized at the American Chemical Society Local Section Banquet

On April 24th, 2012, four students and three faculty members from the chemistry department attended the Central Arkansas Local Section of the American Chemical Society’s annual banquet at the University of Arkansas at Little Rock. The students were nominated by the UCA Department of Chemistry to receive awards for excellence in the areas of academics, research, and service. A photograph of the award recipients is shown below. (from left to right: Katie Primm, Jessica Gambill, Venusa Phomakay, and Tsungyen Chen) Tsungyen Chen received recognition for excellence in academics and research, Jarod Evanov (not pictured) was recognized for excellence in research, Jessica Gambill was recognized for excellence in academics, and Venusa Phomakay and Katie Primm were acknowledged for excellence in service. Venusa was further recognized by receiving the Central Arkansas ACS award for Outstanding Service.

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On Saturday, March 10th, four members of the UCA Society of Physics Students (SPS) and the SPS faculty advisor, Dr. Will Slaton, traveled to Henderson State University for the annual meeting of the Zone X SPS chapters. Students from SPS chapters in Arkansas, Tennessee, Mississippi, and Louisiana gathered to report on the events, activities, and outreach from the previous year. All students participated in a panel discussion on physics careers, a set of focus groups on fundamental RSO ideas (fundraising, fellowship, outreach, and creating a Zone community). There was also an opportunity for students to present research. Physics major Nick Martinez presented a poster on his research with Dr. Azida Walker to the students in attendance. All in all, UCA students left the conference with many new outreach and fellowship ideas for the local SPS chapter as well as some new connections and friends.

Dr. Scott Austin of the Department of Physics and Astronomy was a guest speaker at the 2012 Darwin Day Conference in Little Rock on February 11th.

The conference was hosted by the University of Arkansas at Little Rock and included a keynote presentation by Dr. Kevin Padian, a series of lectures by Arkansas distinguished professors and researchers, workshops, and a student research poster competition.

Dr. Austin spoke on the evidence for the age of Earth and the age of the Universe.

For more information visit: www.arkansasdarwinday.org.
The Chemistry Club celebrated Green Week, April 14th – 20th, by participating in several green activities. The week began with a trip to Heifer International where students learned how Heifer aids individuals and communities by providing them with the power to turn poverty stricken areas into self-reliant communities. This is accomplished by providing individuals with livestock that can be bred so that they may pass along the young to others within the community thereby earning money for their families. The students then toured the headquarters of Heifer International which was designed to be green with a LEED certification platinum status. The students truly enjoyed this experience.

For UCA’s celebration of Green Week, the Chemistry Club participated in many activities on campus. Activities included teaching UCA students about the differences in the energy use associated with regular light bulbs and efficient light bulbs, and showing people how to treat water from streams and lakes to make it potable. The group’s goal was to assist in educating others in ways to be more environmentally friendly.