



Photo by Debra Burris

The UCA STEM Institute



The Arkansas Center for Mathematics and Science Education (ACMSE) is now the UCA Institute for STEM Professional Development and Education Research. In short - **UCA STEM Institute**. The name change reflects the Institute's renewed commitment to educational research and the services it provides.

According to the Arkansas STEM Coalition, during the next decade the demand for scientists and engineers in the United States is expected to increase at least four times the rate for all other occupations. But in general, today's high school students are not performing well in mathematics and sciences and even fewer are pursuing degrees in technical fields. As part of the state's effort to address this issue, the

Institute is playing a vital role in building a program to support the UCA's mission on teacher education and working closely with the new UCA STEM Residential College on various outreach and service learning activities to motivate teachers and students to take an interest in STEM programs. The Institute has been expanding its offerings to include technology training to pre-service teachers, in-service teachers, and K-12 students.

The addition of "STEM" in the title not only shows commitment to the STEM programs in the state but also increases the visibility and functionality of the Institute. Several educational units in the state and across the nation are more familiar with the acronym "STEM" and can better relate to its activities. It is expected for the next 5-10 years there will be a steep increase in funding availability for STEM programs. Thus, changing the name of the center to better reflect its mission, improves prospects of acquiring large grants and hence, better serving the people of Arkansas and our students at UCA.

Save the Date!

Planetarium Public Show
Tuesday, March 1

Chalk Talks
Tuesday, March 8
X-Period, MCS 220

Summer & Fall 2011 Textbook Orders
Due to Bookstore:
Friday, March 11

Bear Facts Day
Saturday, March 12

Observatory Public Show
Tuesday, March 15
8:00 – 10:00 p.m.

Spring Break
March 19 - 27

Mid-Terms
Grades Due by Noon
Wed., March 16

UCA STEM Institute's Open House



The staff of the UCA Institute for STEM Professional Development and Education Research (UCA STEM Institute), formerly known as Arkansas Center for Mathematics and Science Education (ACMSE) held an open house on February 18, 2011 from 3pm – 5pm.

The faculty and staff of the College of Natural Sciences and Mathematics (CNSM) and the College of Education (COE) were invited to tour the facilities and learn about the programs and resources offered by the UCA STEM Institute. About 30 people attended the open house. Since 2008 the Institute has had significant impact in education and educators:

- Grant funds of about \$925,530 have been received.
- More than 50 professional development programs for the K-12 teachers and students have been offered.
- About 600 teachers and 300 students have been through grant programs and special projects.
- Involved 31 UCA faculty members in various teacher training projects.
- Strong collaborations with several Educational Cooperatives and more than 15 school districts have been fostered.
- Collaborative work with COE and CNSM has been established.



In addition to the open house, the President of UCA, Dr. Meadors, and representatives from the Provost Office, College of Natural Sciences and Mathematics (CNSM), College of Education (COE), Arkansas Department of Education (ADE) and school districts were invited for a VIP Hour (from 2:00 PM to 3:00 PM) to discuss how the UCA STEM Institute can help enhance cooperation between UCA, the State of Arkansas and area school activities in the STEM areas.



Environmental Practicum Gets Wet!

In Fall 2010, students from UCA's Environmental Science Program participated in a capstone course that provided them with hands on research in wetland habitats. Their study was designed around issues related to the White Oak Bayou, a tributary of the Arkansas River that is located in Maumelle and North Little Rock in central Arkansas. The city of Maumelle is working in collaboration with North Little Rock to develop a management plan for wetlands within the White Oak Bayou to assess and

implement protection plans for the most critical wetlands as suburban development expands. Sara and Scott Owen of Wetland Consultants, Inc. are overseeing the management plan and worked with UCA students to collect data and to interact with stakeholders at monthly meetings. The final student projects were presented as both a written report and as a presentation open to the public. These reports will be incorporated into the existing management plan. Projects included:

1. GIS Analysis of Land Use Impacts on the White Oak Bayou Watershed (Don Dailey, Brandon Aist, Donald Watson)
2. Survey of Wetland Flora and Potential Impacts of Urbanization (Robert Wade, Ruth Bland, Brittany Gates)
3. Herptofaunal Habitat in White Oak Bayou Wetland Flats (Jake Bird, Meghan Williams, Joseph Potts)
4. Terrestrial Invertebrate Diversity and Density: A White Oak Bayou Watershed Study (Yang Cao, Nicholas Davis, Tristan Phillips, Yasuyo Okumura)
5. Assessing Ecological Health of Wetlands (Anushree Jumde, Ramsy Shuffield, and Hunter Mays)
6. Implementing Environmental Education: Maumelle Middle School (Hayley Sebourn, Wesley Gunselman, Uta Meyer)



Computer Science Department at IEEE Globecom 2010 Conference

In December 2010, Dr. Yu Sun and her student published a peer-reviewed paper at the IEEE Global Communications Conference (Globecom 2010), a premier conference in Telecommunications in the world. The acceptance rate of this conference is 35.6%. 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, the team developed a new rate control algorithm for the emerging H.264 Scalable Video Coding standard. The proposed algorithm can accurately regulate the compression bit rates for miscellaneous networked video applications with diverse needs in resolution, video quality and frame rate.

J. Yang, Y. Sun, Y. Zhou and S. Sun, "Incremental Rate Control for H.264 Scalable Video Coding," Proceedings of *IEEE Global Telecommunications Conference (Globecom 2010)*, Miami, FL, Dec. 2010.



Mayflower Science Night



On Tuesday February 1st, and under very chilly temperatures, faculty and students from the College of Natural Sciences and Mathematics attended the Mayflower Elementary School "Science and Family Night". Disregarding the blustery conditions, 50 to 60 elementary school age children and their corresponding parents and grandparents visited booths and stations where they explored a variety of areas of science and math. Students and their parents: extracted DNA from strawberries, explored their names in numbers, pet a variety of snakes and lizards, matched their bones to their scientific names, explored chemical phenomena, experience the water cycle through an exciting interactive game, or were simply mesmerized by our STEM Residential College students games and the "goo" factory. Another example of what our college is all about: faculty and student collaborating in service, learning, and outreach!



Dr. Burriss Aiming for Arkansas Master Naturalist

Debra Burriss, Assistant Professor in the Department of Physics and Astronomy, is working toward completing her training to become a certified Arkansas Master Naturalist (AMN). To achieve certification she must complete 40 hours of initial training plus an additional 8 hours per year of advanced training and 40 hours of volunteerism through the program. This can include working at one of the state parks as an assistant to the interpreter; trail restoration at the state parks, national forest, or game and fish management areas; and educational outreach in schools. Initial training courses cover a broad range of topics about Arkansas natural history including geology, meteorology, and the specific flora and fauna of Arkansas. The AMN program began in 2005 with a Central Arkansas Chapter and has expanded to 4 chapters around the state. Debra, a member of the River Valley Chapter, feels the program “offers a great opportunity for me to enhance the subjects that I cover in my Physical Science classes while giving my students what I

hope will be a deeper appreciation for this state. Plus it gives me a unique opportunity to represent UCA, the College of Natural Sciences and Mathematics, and the Department of Physics and Astronomy while participating in the various volunteer opportunities the AMN offers. I see it as a win-win situation.”



95th Annual Meeting of
the Arkansas Academy of
Science
Hosted by U of A at
Monticello
April 8 – 9, 2011

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Arkansas Junior
Academy of Science
April 2, 2011

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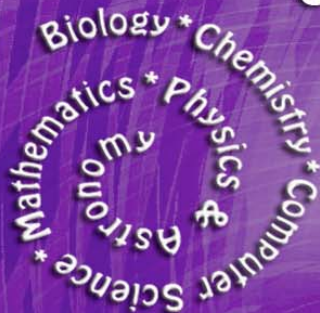
Arkansas
State Science Fair
April 1 – 2, 2011

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Abstracts Due April 1st in electronic format only

*The College of
Natural Sciences and Mathematics*

University of Central Arkansas



Announces

**The 17th Annual Student
Research Poster Symposium**

April 22, 2011

2:00 - 4:00 pm

**McCastlain Hall
Ballroom**

REFRESHMENTS WILL BE SERVED

**COME MEET SOME OF OUR NATION'S FUTURE SCIENTISTS
AND LEARN ABOUT THEIR RESEARCH PROJECTS!**