



## Jerald Manion Outstanding Chemistry Student Award Presented

The University of Central Arkansas presented the first Jerald Manion Outstanding Chemistry Student award to Brian Besel, a senior chemistry major from Rogers. Under the direction of Dr. Patrick Desrochers of the UCA Chemistry Department, Brian's research efforts contributed to two peer-reviewed publications in the internationally-read journal, *Inorganic Chemistry* (in 2009 and 2011). Also, he was twice recognized with cash awards for outstanding oral presentations of his research. Throughout his time at UCA Brian has worked as a teaching assistant for general chemistry, organic chemistry, and quantitative analysis. He has also served as the primary supervisor of tutors for the department's tutoring service. Brian plans to share his passion for chemistry by *(continued)*

## 17<sup>th</sup> Annual College of Natural Sciences & Mathematics Poster Symposium

The 17<sup>th</sup> Annual College of Natural Sciences and Mathematics Student Research Symposium was held on Friday April 22<sup>nd</sup> in the McCastlain Ballroom. The symposium highlights undergraduate and graduate student research projects completed under the guidance of faculty in the College and their collaborators. This event has grown every year with 33 posters from Biology, 17 from Chemistry, 8 from Computer Science, 11 from Mathematics, 10 from Physics and Astronomy, and 2 interdisciplinary posters included in the current program. Presenting the 81 posters were 115 student authors with 37 faculty and 9 external mentors. An important component of the education that students receive in the College of Natural Sciences and Mathematics at UCA is the opportunity to apply knowledge to solving real problems. This symposium is an occasion to celebrate the scientific achievements of our students. To review the abstracts of this year's symposium or those of previous years visit <http://uca.edu/cnsm/student-research/cnsm-annual-symposium/>.

A new event designed to recognize those students who used their undergraduate research as the basis of outstanding departmental honors thesis *(continued)*





*(poster symposium continued)* opened the symposium this year. Two awards were made for Outstanding Honors Thesis; one to Jason Barns in Computer Science and the other two Asami Nishikawa in Physics and Astronomy. These awards are funded through an endowment started by to UCA alumni Drs. Micah Abrams (B.S. Chemistry 01) and William Slaton (B.S. Physics 96) who know the added value that student research brings to the undergraduate programs at UCA. For more information about this opportunity to support our outstanding student researchers, please visit <http://www.aursfund.org/>.



*(Outstanding Chemistry Student Award continued)*

becoming a high school teacher.

The award was made possible when Dr. Slaton Fry of Batesville, a 1980 UCA graduate of the Chemistry Department and Beebe, Arkansas native, and his wife, Diann, established the endowment in honor of his former professor.

“I can truthfully say that I would never had made it through the four years at UCA and the subsequent four years of graduate school without Dr. Manion's support and advice,” Dr. Fry said. “I had to pay my own way

Left to right: Slaton Fry, Diann Fry, Brian Besel, and Jerry Manion

through school and had to work all four years while I was at UCA. Dr. Manion made sure I had plenty of opportunities to earn my way by helping me to find jobs and work while I was a full time student. He went out of his way to ensure I could finish my studies without having to quit for economic reasons. I know many other UCA chemistry graduates could and would say the same thing.”

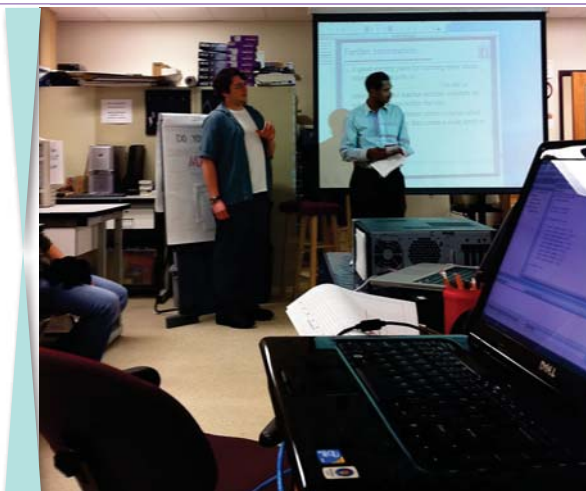
Manion, a Conway resident, Beebe, Arkansas native and a Harding College graduate, is the current longest-serving professor at UCA, having started at UCA in 1965 as the chair of the Chemistry Department. During that time, he has mentored hundreds of chemistry and science majors while teaching, conducting research and leading the chemistry department. He remains active in promoting chemistry education to elementary and

junior high students, as well as continuing to serve the university as a student advisor, committee leader, and university representative to the Arkansas Junior Academy of the Sciences.

The Jerald Manion Outstanding Chemistry Student award will be awarded annually to the top all-around student in the chemistry department. The student must excel in the classroom, conduct research and give service to the chemistry department and university during their tenure.

For more information on the UCA Chemistry Department call 501-450-3152. For information about the Jerald Manion Outstanding Chemistry Student Award and how to contribute to it, contact the UCA Foundation at 501-450-5288.

## Computer Science Roadshows



The Department of Computer Science organized *CS Roadshows* at Benton Junior High School and Hope High School on April 26<sup>th</sup> 2011. Computer Science undergraduates Jason Barnes, Luke Irvin, and Rema Taneja participated in the roadshows conducted under the leadership of Dr. Vamsi Paruchuri, an Assistant Professor in Computer Science at UCA.

The presentations started with an overview of Computer Science and career options for CS majors by Dr. Paruchuri. Later, Rema Taneja, a sophomore CS major and alumnus of Benton High School, gave an introduction to game programming and animations. Luke Irvin, a graduating senior majoring



in CS and an alumnus of Hope High School, presented multiple career options in mobile programming. Jason Barnes, also a graduating senior in

CS, gave an overview on computer security and hacking. The undergraduate students also shared their perspectives of Computer Science and UCA. Rema Taneja is the CS Club secretary, Luke Irvin has co-founded the company Conway Cowork and Jason Barnes will be pursuing his Ph.D., degree at Washington University in St. Louis.

Computer-related technology is increasingly driving the U.S. economy and according to The National Association of Colleges and



Employers, computer science ranks as one of the top five highest-paying career paths. This field is projected to further expand within the next decade. However, the number of computer science majors in the United States is declining. One of the primary reasons is the absence of exposure to computer science and computational thinking in the high school experience. The vast majority of high school students have no concept of what a major in Computer Science entails and lack awareness of multiple career opportunities for CS majors. To help resolve this problem, the Computer Science Department at the University of Central Arkansas is organizing these road trips aimed at piquing students' interests in CS.

## Software Engineering Presentation

Priyatham Anisetty presented a paper he co-authored with Dr. Paul Young titled "Collaboration Problems in Group Projects" at The Ninth Annual Consortium for Computing Sciences in Colleges Mid-South Conference, held in Conway April 1-2, 2011. The paper stems from experience gained while directing the members of Dr. Young's Software Engineering Class in a class-wide, semester-long software development project.

## College of Natural Sciences and Mathematics Thesis Awards

The top departmental honors theses in the Computer Science and Physics & Astronomy Departments were acknowledged at the CNSM Student Research Symposium, April 22nd. Thesis awards were in the amount of \$100 each and were sponsored by The Advancement of Undergraduate Research in the Sciences Endowment.

The top thesis in Computer Science was awarded to Jason Barnes for his thesis entitled, "Optimal Phase Ordering of Traffic Signals to reduce Stopped Delay." Jason worked with Dr. Vamsi Paruchuri on the thesis. Congestion in the road network results in prolonged travel time to the general public, adds extra cost to economic activities, and raises



*Left to Right: Chenyi Hu, Vamsi Paruchuri, Jason Barnes*

the pressure on road safety and the environment. Traffic signals are an elementary component of all urban road networks and play a critical role in controlling the flow of vehicles. However, current road transportation systems and traffic signal implementations are very inefficient. The objective of Jason's research is to evaluate optimal phase ordering within a signal cycle to minimize the average waiting delay of vehicles and thus in turn minimize fuel consumption and greenhouse gas emissions. Through extensive analysis, Jason and Dr. Paruchuri show that by choosing optimal phase ordering, the stopped delay can be reduced up to 40% per car at each signal, resulting in a saving of up to 100 gallons of fuel per traffic signal each day.

The top thesis in Physics and Astronomy was awarded to Asami Nishikawa for her thesis entitled, "Aeroacoustic Source Strength Measurement of a Helmholtz Resonator." Asami worked with Dr. William Slaton. Her project examined the excitation of an acoustic resonator by flow over the resonator's opening. This is similar to how an empty soda bottle resonates when it is blown over. *(Continued)*



Left to Right: Asami Nishikawa, Stephen Addison

(*CNSM Thesis Awards continued*) Asami used a small wind tunnel with a variable flow speed to excite the fundamental acoustic mode of large five-liter flasks connected to the wind tunnel. Asami confirmed prior work in the field, and in our lab, regarding the character of the resonator's response to changes in flow rate and changes in resonator geometry. The dimensions of the resonator define the resonance frequency of the system. Secondly, and more importantly, she measured the flow of air in the wind tunnel before and after the opening to the resonators. This measurement allowed her to calculate the change in kinetic energy of the

flow, which should equal the work done by the flow to excite and sustain the acoustic resonance of the system. These measurements gave her the ability to quantify how efficiently the system converts flow energy into acoustic energy. She found that approximately 30% of the incoming main flow energy is removed from the flow irrespective of geometry at the highest acoustic amplitudes. This work has applications to automobile design, high pressure piping systems and ventilation duct flow.

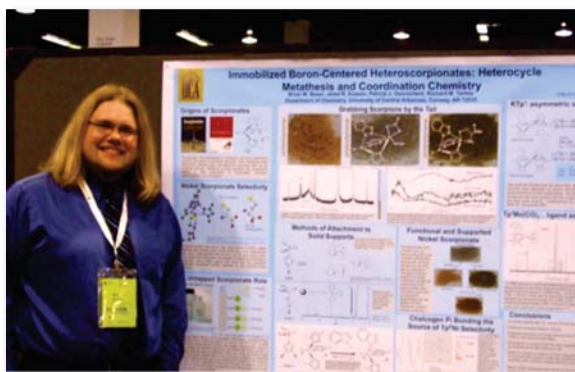
Dr. Micah Abrams and Dr. William Slaton established the Advancement of Undergraduate Research in the Sciences Endowment at the UCA Foundation in 2008. Drs Abrams and Slaton are both alumni of UCA and support the College of Natural Sciences and Mathematics' mission to provide current, superior learning opportunities for students and to advance knowledge of the core disciplines of Biology, Chemistry, Computer Science, Mathematics and Physics & Astronomy through undergraduate research. The awarding of top departmental theses each year represents the successful attainment of the endowment's first funding goal. Future funding goals are to be able to support undergraduate research students for a semester, summer, or entire year. More information about the fund and how to contribute is available on the fund website, <http://www.aurfund.org>, or by contacting Will Slaton, [wvslaton@uca.edu](mailto:wvslaton@uca.edu).



## Students Attend American Chemical Society Conference in Anaheim, CA

Anaheim, California played host to nineteen undergraduate students and six faculty members from the University of Central Arkansas Chemistry Department from March 26th – 29th. The students and faculty attended the 241st National Meeting of the American Chemical Society. The meeting included symposia on

topics as diverse as energy & the environment, nanotechnology, biological & medicinal chemistry, and chemical education. The students took advantage of the programming to attend symposia about how to operate a successful student affiliate chapter and listen to lectures by preeminent scientists including Nobel (*continued*)



Brian Besel

(*Conference continued*) Laureate Akira Suzuki. Casey Thurber, a Senior Chemistry major, summed up the experience well. "This conference gave us an opportunity to find out about current chemistry research by attending seminars and poster sessions. Additionally, the Exposition gave us a chance to find out about industry related fields through discussions with exhibitors."

The students presented research that they had conducted as part of independent study projects in collaboration with UCA chemistry faculty members Drs. Patrick Desrochers, Lori Isom, Melissa Kelley, Karen Steelman, William Taylor, Richard Tarkka, Donald Perry, and Lance Bridges. Most students have worked for at least a year on their project, others for more than three years. Brian Besel, who works with Drs. Desrochers and Tarkka, was invited to present his research at Sci-Mix, where the best posters from the entire meeting are highlighted. Also presented at Sci-Mix was the UCA ACS Chapter poster highlighting the promotion of chemistry in Arkansas.

Even though the students spent most of their time in symposia and poster sessions, the Anaheim trip was not all work and no play. The students had the opportunity to explore Anaheim, visit Universal Studios, and dine with UCA alumnus Joe Allison. A portion of the cost of this trip was funded by an endowment set up by Joe Allison to support chemistry student presentations at national meetings like this.



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## Chemistry Department Recognitions

The American Chemical Society (ACS) Local Section held their annual banquet at the University of Arkansas in Little Rock on April 19, 2011. At the banquet several individuals from the University of Central Arkansas Chemistry department were recognized for outstanding achievements. Brian Besel received the Research Award for outstanding undergraduate research. Brian has been doing research with Dr. Patrick Desrochers for the last three years. This research has led to two publications in peer reviewed journals and presentations at national meetings. Kaleb Smithson received the Scholarship Award for outstanding performance in academics. Both Casey Thurber and Jabin Miller received the Service Award for their service to the department. Casey serves as the Treasurer for the UCA ACS Chapter and has assisted with Museum of Discovery activities during National Chemistry Week to name just a couple of

his activities. Jabin has gone above and beyond in helping the department in the office and in the stockroom.

In addition to the recognition of UCA students at the banquet, Dr. Karen Steelman was recognized for her efforts as Past President of the local ACS section and was surprised when she received the Professor of the Year award. Casey Thurber and Kaleb Smithson, two individuals that submitted letters of recommendation, were present to share their reason for the nomination. Casey said "This was an amazing accomplishment for Dr. Steelman and an award that she absolutely deserved because of her service inside and outside the department." When asked about the evening, Kaleb said "I was very honored to have been invited to the Local ACS banquet to receive my award. It really meant a lot coming from all of my past and present professors."



*Left to Right: Jabin Miller, Kaleb Smithson, Brian Besel, Casey Thurber*



*Left to Right: Kaleb Smithson, Karen Steelman, Casey Thurber*

## STEM Game Night

The UCA Student Chapter of the American Chemical Society hosted game night in the STEM residential college April 8, 2011. Students played Apples to Apples, Mad Gab, and danced the night away using a Wii. It was a blast! This was an opportunity for freshman and sophomores to interact with junior and senior chemistry majors in an informal setting.



## 2011 Physics & Astronomy



*Left to Right: First Row, Dr. Stephen Addison, Tray French, Renee Brock, Caroline Davis, Dr. Balraj Menon  
Back Row, Drs. Jack Gaiser, William Slaton, Rahul Mehta, Debra Burris, Ms. Nancy Austin, Dr. Carl Frederickson, not pictured Asami Nishikawa, and Alec Watson*

Graduating Class

## 2011 UCA Graduating Chemistry Majors Recognized at Departmental Picnic

On Friday, May 6, the Department of Chemistry hosted a picnic in the Buffalo Alumni Pavilion to recognize our ten graduating senior chemistry majors. Chemistry faculty, staff, and students enjoyed the beautiful weather and delicious food brought by faculty and staff. Each graduating senior was presented with a UCA t-shirt, a UCA coffee

mug, and a small stuffed animal of a mole with safety glasses that could be adhered to a graduation cap. Those students who earned degrees that are approved by the American Chemical Society were presented with certificates from the ACS as well as ACS graduation cords. The following students were recognized:

### BS with Major in Chemistry

Kali McGhehey  
Kaleb Smithson  
Judith Higgins

### BS in Chemistry, Biochemistry Track, ACS-Certified

Philip Cook  
Jabin Miller  
Elizabeth Dourlain

### BS in Chemistry, Standard Track, ACS-Certified

Casey Thurber  
Derek Watts  
Mary Freres  
Brian Besel

## Chemistry Department Graduating Senior Class of 2011



*Back row, left to right: Philip Cook, Derek Watts, Kaleb Smithson, Casey Thurber, and Brian Besel  
Front row, left to right: Elizabeth Dourlain, Kristin Thorvilson, \*Brandi Bowlin, \* and Judith Higgins  
\*Kristin Thorvilson and Brandi Bowlin are graduating senior biology majors who earned minors in chemistry and participated in undergraduate research projects with chemistry faculty. Chemistry majors Kali McGhehey, Jabin Miller, and Mary Freres are not pictured.*

Also at the picnic, the following recipients of senior chemistry major awards were recognized:

Jerald Manion Student Award (best all-around graduating senior chemistry major): Brian Besel  
Senior Chemistry Student Award; Distinction in Academics: Kaleb Smithson  
Senior Chemistry Student Award; Distinction in Service: Jabin Miller and Casey Thurber  
Senior Chemistry Student Award; Distinction in Research: Brian Besel

## The Award Winning Students



*Left to right: Brian Besel, Casey Thurber, Kaleb Smithson, and Dr. Mauldin, not pictured is Jabin Miller.*

## Chemistry Department Faculty and Staff



*Back row: Robert Mauldin, Nolan Carter, Karen Steelman, K.C. Weaver, Jerry Manion, and Bill Taylor  
Middle row: Billina Matthews, Rick Tarkka, Don Perry, and Paul Krause  
Front row: Lori Isom, Melissa Kelley, Pat Desrochers, and Faith Yarberry  
Not pictured are Dani Shi, Lance Bridges, Kristin Dooley, and Cameron Dorey.*