

2014

## Keynote Speaker and Meeting Program

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## KEYNOTE ADDRESS

### Beyond Hubble: A New Era in Astronomy with NASA's James Webb Space Telescope



For over 20 years, the Hubble Space Telescope has been revealing the unknown cosmos; this single scientific instrument has completely revolutionized our understanding of the Universe. In 2009, the complete refurbishment of Hubble gave new life to the telescope and has produced groundbreaking science results, revealing some of the most distant galaxies ever discovered. Despite the remarkable advances in astronomy that Hubble has provided, the new questions that have arisen demand a new space telescope with new technologies and capabilities. I will present the exciting new technology development and science goals of Hubble's 100x-more-powerful successor, NASA's James Webb Space Telescope, which is currently being built and tested and will be launched later this decade.

Dr. Amber Straughn is an Astrophysicist at NASA's Goddard Space Flight Center in Greenbelt, MD and serves as the Deputy Project Scientist for James Webb Space Telescope Communications & Outreach.

Amber grew up in the small farming town of Bee Branch, Arkansas where her fascination with astronomy began under beautifully dark, rural skies. She obtained her B.S. in Physics at the University of Arkansas in Fayetteville in 2002, and completed her M.S. and Ph.D. in Physics at Arizona State University in 2008. She has been involved in NASA Education and Research programs since her undergrad years, beginning with flying an experiment on NASA's microgravity KC-135 plane (the "vomit comet") in 2001. During graduate school at Arizona State, Amber received the NASA Space Grant Fellowship for summer studies, and in 2005 was awarded the 3-year NASA Harriett Jenkins Pre-doctoral Fellowship.

Amber's research focuses on interacting and star-forming galaxies in the context of galaxy assembly, and she has most recently been working on infrared spectroscopic data from the new Wide Field Camera 3 (WFC3) on Hubble Space Telescope. Her broad research interests include galaxy formation and evolution, galaxy mergers and interactions, physical processes induced by galaxy interactions including star formation and black hole growth, emission-line galaxies, and dark energy and its effect on the galaxy merger rate.

In addition to research, Amber's role with the James Webb Space Telescope project involves working with Communications and Outreach activities. She has participated in extensive public speaking events locally, nationally, and internationally. Amber has also done several live television interviews, media features for NASA (see <http://www.nasa.gov/topics/technology/features/webb-faqs.html>), and appeared in the Late Night with Jimmy Fallon's "Hubble Gotchu" segment that aired in August 2010, and has interviewed for documentaries. She very much enjoys interacting with the public.

Amber lives in Glenn Dale, MD, with her husband Matt and her two Great Danes and one cat. Outside of her NASA work, she is a yoga teacher and is currently training for her private pilot's license.

## Meeting Report

### SECTION PROGRAMS ORAL PRESENTATIONS

(Presenter is underlined)

#### ORAL SESSIONS 1: FRIDAY 1:00-2:30

**PHYSICS AND ENGINEERING** 207  
CHAIR: Mostafa Hemmati

**1:00**  
**DETECTION & RANGING SYSTEMS FOR PROXIMITY FLIGHT OF COOPERATING 6U CUBESATS**

Mustafa Bayraktar<sup>1</sup>, Yupo Chan<sup>1</sup>, Po-Hao Adam Huang<sup>2</sup>, Edmond W. Wilson, Jr.<sup>3</sup>

<sup>1</sup>University of Arkansas for Medical Sciences, <sup>2</sup>Univ. of Arkansas, Fayetteville, <sup>3</sup>Harding University

**1:15**  
**DESIGN OF CCD ARRAY DETECTOR FOR A CZERNY-TURNER SPECTROGRAPH**

Brennan Thomason, Tamara Reed, and Edmond Wilson.  
Harding University

**1:30**  
**SOFTWARE DEVELOPMENT FOR A DIODE LASER SPECTROMETER**

Amlam Niragire, Chih Hao Wu, and Edmond Wilson. Harding University

**1:45**  
**OPTICAL ABSORPTION PROPERTIES OF GLANCING ANGLE DEPOSITED NANOSTRUCTURE ARRAYS IN DIFFERENT GEOMETRIES**

Hilal Cansizoglu<sup>1</sup>, Mehmet Cansizoglu<sup>1</sup>, Miria M. Finckenor<sup>2</sup>, and Tansel Karabacek<sup>1</sup>.

<sup>1</sup>University of Arkansas at Little Rock, <sup>2</sup>NASA Marshall Space Flight Center

**2:00**  
**TORNADO-TERRAIN INTERACTION EFFECTS ON TORNADO DAMAGE USING GOOGLE EARTH**

Nawfal Ahmed, R. Panneer Selvam, University of Arkansas

**2:15**  
**WHAT'S REALLY INVOLVED IN BUILDING A 3D PRINTER?**

Justin Nesselrotte, and Edmond Wilson. Harding University

**CHEMISTRY & BIOCHEMISTRY** 208  
CHAIR: David Cole

**1:00**  
**BOND LENGTH / BOND VALENCE RELATIONSHIPS FOR IRON-IRON, IRON-SULFUR, AND SULFUR-SULFUR BONDS**

Welyu (Daniel) Lu, and Franklin D. Hardcastle. Arkansas Tech University

**1:15**  
**SYNTHESIS AND CHARACTERIZATION OF TRANSITION METAL COMPLEXES WITH HEXADENTATE HEMI-CAGE LIGAND**

Megan Fuller, and Anwar Bhuiyan. Arkansas Tech University

**1:45**  
**ATOMIC ORBITAL EXPONENTS FROM VALENCE-LENGTH RELATIONSHIPS**

Franklin D. Hardcastle. Arkansas Tech University

**2:00**  
**HYPOCHLOROUS ACID AS A METHOD OF SWIMMING POOL SANITATION**

Kelton Schleyer, and Dennis Province. Harding University

**2:15**  
**CATALYSTS TESTING WITH CARBON PASTE ELECTRODES**  
Steve Gann. Arkansas Tech University

**CELL & MOLECULAR BIOLOGY** 209  
CHAIR: Joshua Sakon

**1:00**  
**EVALUATING THE ROLE OF MEIOTIC GENES IN DNA REPAIR USING RNAi**

Younna E. Moufarrej, Sydney L. Haldeman, Emily R. Cariker, and Andrew M. Schurko. Hendrix College

**1:15**  
**COLLAGEN TARGETING MECHANISM OF BACTERIAL COLLAGENASE**

Joshua Sakon. University of Arkansas

**1:30**  
**ACETAMINOPHEN INCREASES STYRENE BIOACTIVATION TO A TOXIC METABOLITE BY CYP2E1**

Jessica H. Hartman, and Grover P. Miller.  
University of Arkansas for Medical Sciences

**1:45**  
**WARFARIN METABOLITE PROFILES REVEAL THE IMPORTANCE OF FACTORS ON PATIENT DOSE-RESPONSES TO ANTICOAGULANT THERAPY**

Dakota Pouncey. Hendrix College

**2:00**  
**DISCOVERY AND GENOMIC ANALYSIS OF TWO NOVEL MYCOBACTERIOPHAGES**

Alyssa Stubblefield, Nathan Reyna, and Ruth Plymale.  
Ouachita Baptist University

**2:15**  
**USING MACHINE LEARNING ALGORITHMS TO PREDICT DRUG METABOLISM BY CYP2C ENZYMES**

Eugene Nyamugenda<sup>1</sup>, Jessica H. Hartman<sup>2</sup>, Grover P. Miller<sup>2</sup>.  
<sup>1</sup>Hendrix College, <sup>2</sup>University of Arkansas for Medical Sciences

**VERTEBRATE BIOLOGY** 210  
CHAIR: Steve Cooper

**1:00**  
**URBAN STREAM SYNDROME IN A SMALL TOWN: A COMPARATIVE STUDY OF SAGER AND FLINT CREEKS**

T.S. Wakefield. John Brown University

**1:15**  
**ONSET OF SCALE FORMATION IN ALLIGATOR GAR**  
Anthony V. Fernando, and Steve E. Lochmann. Department of Aquaculture and Fisheries, University of Arkansas at Pine Bluff

**1:30**  
**DETERMINING INDIVIDUALISTIC VOCAL CHARACTERISTICS OF PANTHERA TIGRIS AND IMPLICATIONS FOR ACOUSTIC MONITORING OF IN-SITU POPULATIONS**

Courtney Elizabeth Dunn, and Mary Victoria McDonald.  
University of Central Arkansas

## Arkansas Academy of Science

- 1:45**  
**SIZE AND AGE RECORDS FOR AN ARKANSAS SPECIMEN OF THE AMERICAN BULLFROG, *LITHOBATES CATESBEIANUS* (ANURA: RANIDAE), FROM NORTHEASTERN ARKANSAS**  
 Stanley E. Trauth, and Timothy A. Welch. Arkansas State University
- 2:00**  
**DISTRIBUTION OF THE NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*) IN ARKANSAS**  
 D.B. Sasse<sup>1</sup>, M.J. Harvey<sup>2</sup>, J.J. Jackson<sup>3</sup>, P.R. Moore<sup>4</sup>, R.W. Perry<sup>5</sup>, T.S. Risch<sup>4</sup>, D.A. Saugey<sup>6</sup>, and J.D. Wilhide<sup>3</sup>.  
<sup>1</sup>Arkansas Game and Fish Commission, <sup>2</sup>Tennessee Technological University, <sup>3</sup>Jackson Environmental, <sup>4</sup>Arkansas State University, <sup>5</sup>U.S. Forest Service, <sup>6</sup>Nightwing Consulting
- 2:15**  
**VARIATION IN THERMALLY INDUCED CROSS-PROTECTION IN CHANNEL CATFISH EXPOSED TO AN AMMONIA CHALLENGE**  
 Sindhu Kaimal, and Alf H. Haukenes. University of Arkansas-Pine Bluff
- INVERTEBRATE BIOLOGY**                      **Liberty Room**  
**CHAIR: Ryan Stork**
- 1:00**  
**NEW HOST AND DISTRIBUTION RECORDS OF THE LEECH *PLACOBDELLA MULTILINEATA* MOORE, 1953 (HIRUDINIDA: GLOSSIPHONIIDAE)**  
 William E. Moser<sup>1</sup>, Dennis J. Richardson<sup>2</sup>, Chris T. McAllister<sup>3</sup>, J. T. Briggler<sup>4</sup>, Charlotte I. Hammond<sup>2</sup>, and Stanley E. Trauth<sup>5</sup>.  
<sup>1</sup>Smithsonian Institution, National Museum of Natural History, <sup>2</sup>Quinnipiac University, <sup>3</sup>Eastern Oklahoma State College, <sup>4</sup>Missouri Department of Conservation, <sup>5</sup>Arkansas State University
- 1:15**  
**NEW HOST AND LOCALITY RECORDS FOR THE FISH LEECHES *MYZOBDELLA LUGUBRIS* AND *MYZOBDELLA REDUCTA* (HIRUDINIDA: PISCICOLIDAE) FROM ARKANSAS AND OKLAHOMA**  
 Dennis J. Richardson<sup>1</sup>, William E. Moser<sup>2</sup>, Chris T. McAllister<sup>3</sup>, Renn Tumblison<sup>4</sup>, Charlotte I. Hammond<sup>1</sup>, Henry W. Robison<sup>5</sup>, David A. Neely<sup>6</sup>.  
 Quinnipiac University<sup>1</sup>, <sup>2</sup>Smithsonian Institution, National Museum of Natural History, <sup>3</sup>Eastern Oklahoma State College, <sup>4</sup>Henderson State University, <sup>5</sup>Southern Arkansas University, <sup>6</sup>Tennessee Aquarium Conservation Institute
- 1:30**  
**A REVIEW OF SYMBIOTIC RELATIONSHIPS IN STENOPODIDEAN SHRIMPS**  
 Joseph W. Goy. Harding University
- 1:45**  
**MISCELLANEOUS FISH HELMINTH PARASITE (TREMATODA, CESTOIDEA, NEMATODA, ACANTHOCEPHALA) RECORDS FROM ARKANSAS.**  
 C.T. McAllister<sup>1\*</sup>, C.R. Burse<sup>2</sup>, H.W. Robison<sup>3</sup>, D.A. Neely<sup>4</sup>, M.B. Connior<sup>5</sup>, and M.A. Barger<sup>6</sup>. <sup>1</sup>Science and Mathematics Division, Eastern Oklahoma State College, Idabel, OK 74745; <sup>2</sup>Department of Biology, Pennsylvania State University, Shenango Campus, Sharon, PA 16146; <sup>3</sup>9717 Wild Mountain Drive, Sherwood, AR 72120; <sup>4</sup>Tennessee Aquarium Conservation Institute, Chattanooga, TN 37402; <sup>5</sup>Health and Natural Sciences, South Arkansas Community College, El Dorado, AR 71730; and <sup>6</sup>Department of Natural Sciences, Peru State College, Peru, NE 68421.
- 2:00**  
**DISTRIBUTION, HABITAT, AND STATUS OF THE DITCH FENCING CRAYFISH, *FAXONELLA CLYPEATA* (HAY) (DECAPODA: CAMBARIDAE) IN ARKANSAS.**  
 H.W. Robison<sup>1</sup> and C.T. McAllister<sup>2</sup>. <sup>1</sup>9717 Wild Mountain Drive, Sherwood, AR 72120; and <sup>2</sup>Science and Mathematics Division, Eastern Oklahoma State College, Idabel, OK 74745.
- ORAL SESSIONS II: FRIDAY 3:00-5:00**
- PHYSICS AND ENGINEERING**                      **207**  
**CHAIR: Charles Wu**
- 3:00**  
**DYNAMIC EFFECT OF TORNADO FORCES ON CYLINDRICAL STRUCTURES**  
 Majdi Yousef, R. Panneer Selvam, and Piotr Gorecki.  
 University of Arkansas, Fayetteville
- 3:15**  
**SPEED AND CURRENT RELATION IN ANTI-FORCE BREAKDOWN WAVES**  
 Ryan Evans, and Mostafa Hemmati. Arkansas Tech University
- 3:30**  
**WAVE PROFILE FOR LOW SPEED CURRENT BEARING WAVES**  
 Preston Galla, and Mostafa Hemmati. Arkansas Tech University
- 3:45**  
**PHOTOVOLTAIC MATERIALS RESEARCH AT ARKANSAS STATE UNIVERSITY-AN UPDATE**  
 Joshua Vangilder, Dr. Robert Engelken, M. Jason Newell, Maqsood Ali Mughal, Kayla Wood, and Shyam Thapa. Arkansas State University
- 4:00**  
**GROWTH OF ZnO NANOROD AND NANOFLOWER STRUCTURES BY A FACILE TREATMENT OF Zn FILMS IN HOT DE-IONIZED WATER**  
 Khedir R. Khedir, Zubayda S Saifaldeen, Taha Demirkan, Rosure B. Abdulrahman, and Tansel Karabacak. Department of Applied Science University of Arkansas at Little Rock
- 4:15**  
**SPUTTER DEPOSITED TUNGSTEN CARBIDE (WC) NANORODS FOR CATALYTIC APPLICATIONS AND THIN FILMS WITH COMPLIANT LAYERS FOR WEAR RESISTANT APPLICATIONS**  
 Mehmet F. Cansizoglu, and Tansel Karabacak. Department of Applied Science, University of Arkansas at Little Rock
- 4:30**  
**EFFICIENCY MEASUREMENT OF WHITE LED DEVICE**  
 Ahmed Zurfi, Dallas Tompkins, and Jing Zhang. Department of Systems Engineering, University of Arkansas at Little Rock
- 4:45**  
**A COMPARISON OF THE DIFFERENT INDEPENDENT TECHNIQUES FOR MEASURING SUPERMASSIVE BLACK HOLE MASSES**  
 Ismaeel Al-Baidhany<sup>1</sup>, Marc Seigar<sup>1</sup>, Patrick Treuthardt<sup>1</sup>, Amber Sierra<sup>1</sup>, Ben Davis<sup>2</sup>, Daniel Kenniffick<sup>2</sup>, Julia Kenniffick<sup>2</sup>, and Claud Lacy<sup>2</sup>.  
<sup>1</sup>University of Arkansas at Little Rock. <sup>2</sup>University of Arkansas at Fayetteville
- CHEMISTRY & BIOCHEMISTRY**                      **208**  
**CHAIR: Kevin Stewart**
- 3:00**  
**AN OPTICAL NANOSAT DETECTION AND RANGING SYSTEM (SADARS)**  
 Maurisa Orona, Andrew Couch, and Edmond Wilson. Harding University

## Meeting Report

**3:15**  
**APPARATUS FOR CONCENTRATING PLANT AND HUMAN VOLATILES**

Maegen Sloan, Brittany Gibson, Ozioma Whittaker, and Edmond Wilson. Harding University

**3:30**  
**DESIGNS FOR A RAMAN SPECTROMETER**

Maria Medrano, Trevor Drury, and Edmond Wilson. Harding University

**3:45**  
**DESIGNING A SAMPLE HOLDER AND OPTICS FOR USE IN RAMAN SPECTROSCOPY**

Trevor Drury, Maria Medrano, and Edmond Wilson. Harding University

**4:00**  
**OPTIMIZATION OF FUEL GRAIN GEOMETRIES FOR HYBRID ROCKETS USING AN ADDITIVE MANUFACTURING PROCESS**

Rachel Beeman, and Edmond Wilson. Harding University

**4:15**  
**EXAMINING THE CLAIMS OF NATURAL PRODUCTS: AN EVALUATION OF THE ANTIMICROBIAL AND ANTIOXIDANT PROPERTIES OF AUSTRALIAN TEA TREE OIL**

Chelsea Essary, and Dennis Province. Harding University

**4:30**  
**SPECTROSCOPY OF COMBUSTION OF HYDROCARBONS FROM 200 NM TO 1650 NM**

Maddison Greene, and Edmond Wilson. Harding University

**4:45**  
**THE CRYSTAL STRUCTURE EFFECT OF THE SYNTHESIS OF COBALT OXIDE NANOPARTICLES USING MULTIPLE ITERATIONS OF A RECYCLABLE PRECIPITATION REACTION**

J.S. Pennington, and R. J. Tackett. Arkansas Tech University

**CELL & MOLECULAR BIOLOGY** **209**  
**CHAIR: Grover Miller**

**3:00**  
**PROTECTIVE EFFECTS OF AQUEOUS EXTRACT OF TERMINALIA ARJUNA BARK AGAINST DOXORUBICIN-INDUCED CARDIOTOXICITY**

Sarah Bishop<sup>1</sup>, and Shi Liu<sup>2</sup>.

<sup>1</sup>Ouachita Baptist University, Dept. of Pharmaceutical Sciences, College of Pharmacy, <sup>2</sup>University of Arkansas for Medical Sciences

**3:15**  
**ASSESSMENT OF TOTAL PHENOLICS AND ANTI-OXIDATION CAPACITIES IN WHEAT SEEDS**

Michelle Poe<sup>1</sup>, Andra Bates<sup>1</sup>, Luther Talbert<sup>2</sup>, Jamie Sherman<sup>2</sup>, and Joseph Onyilagha<sup>1</sup>.

<sup>1</sup>University of Arkansas at Pine Bluff, <sup>2</sup>Montana State University

**3:30**  
**INTRAVESICAL CHITOSAN/IL-12 IMMUNOTHERAPY INDUCES TUMOR-SPECIFIC SYSTEMIC IMMUNITY AGAINST BLADDER CANCER**

Sean Smith, and David Zaharoff. University of Arkansas

**3:45**  
**FRESHMAN FIND PHAGE!**

Jessica Ashcraft, Ruth Plymale, and Nathan Reyna.

Ouachita Baptist University

**4:00**  
**AGING IS A DETERMINANT IN ANOXIA STRESS TOLERANCE IN CAENORHABDITIS ELEGANS**

J.M. Goy. Harding University

**4:30**  
**INBRE Opportunities**

**VERTEBRATE BIOLOGY** **210**  
**CHAIR: Cynthia Jacobs**

**3:00**  
**A TEST OF ALTERNATIVE MODELS FOR INCREASED TISSUE NITROGEN ISOTOPE RATIOS DURING FASTING IN HIBERNATING ARCTIC GROUND SQUIRRELS**

Trixie Lee<sup>1</sup>, C. Loren Buck<sup>2</sup>, and Brian M. Barnes<sup>2</sup>

<sup>1</sup>Harding University, <sup>2</sup>University of Alaska Anchorage

**3:15**  
**USING eDNA FROM SOIL SAMPLES TO DETECT TERRESTRIAL SPECIES**

Subir B. Shakya, Pablo A. Bacon, and Abraham E. Tucker.

Southern Arkansas University

**3:30**  
**ECOLOGY OF THE SQUIRREL TREEFROG (HYLA SQUIRELLA) IN SOUTHERN ARKANSAS**

M. B. Connior<sup>1\*</sup>, T. Fulmer<sup>2</sup>, C. T. McAllister<sup>3</sup>, and C. R. Bursley<sup>4</sup>

<sup>1</sup>Health and Natural Sciences, South Arkansas Community College, El Dorado, AR 71730, <sup>2</sup>1033 Magnolia Drive, El Dorado, AR 71730, <sup>3</sup>Science and Mathematics Division, Eastern Oklahoma State College, Idabel, OK 74745, <sup>4</sup>Department of Biology, Pennsylvania State University-Shenango Campus, Sharon, PA 16146

**3:45**  
**PLEISTOCENE SEED DISPERSAL OF ANACHRONISTIC FRUITS: USING ELEPHANTS TO TEST ANCIENT PLANT-ANIMAL INTERACTIONS**

Charlie N. Davis, Madison J. Boone, and Laura Klasek. Hendrix College

**4:00**  
**LAND USE CHANGES IN THE FAYETTEVILLE SHALE GAS DEVELOPMENT REGION**

Alex B. Cox, Rachel L. Wells, and Chloe Benichou. Hendrix College.

**4:15**  
**GROWTH AND REPRODUCTION IN THE OUACHITA MADTOM (NOTURUS LACHNERI) AT THE PERIPHERY OF ITS DISTRIBUTION**

Renn Tumlinson, and James O. Hardage III. Henderson State University

**INVERTEBRATE BIOLOGY** **Liberty Room**  
**CHAIR: Joseph Goy**

**3:00**  
**PLAGIOPORUS (DIGENEA: OPECOELIDAE) OF ARKANSAS AND MISSOURI**

Thomas J. Fayton<sup>1</sup>, Chris T. McAllister<sup>2</sup>, and Matthew B. Connier<sup>3</sup>.

<sup>1</sup>Department of Coastal Sciences, Gulf Coast Research Laboratory, University of Southern Mississippi, <sup>2</sup>Division of Science and Mathematics, Eastern Oklahoma State College, <sup>3</sup>Health and Natural Sciences, South Arkansas Community College

**3:15**  
**PROPORTIONALITY OF POPULATION PARAMETERS OF CLINOSTOMUM METACERCARIE IN THE OROBRANCHIAL CAVITY OF MICROPTERUS DOLOMEIU AND M. PUNCTULATUS**

James J. Daly, Sr. University of Arkansas for Medical Sciences (retired)

**3:30**  
**A COMPARATIVE STUDY OF HELMINTH PARASITES OF THE MANY-RIBBED SALAMANDER, EURYCEA MULTIPLICATA AND OKLAHOMA SALAMANDER, EURYCEA TYNERENSIS (CAUDATA: PLETHODONTIDAE), FROM ARKANSAS AND OKLAHOMA**

## Arkansas Academy of Science

C.T. McAllister<sup>1\*</sup>, M.B. Connior<sup>2</sup>, C.R. Bursey<sup>3</sup>, and H.W. Robison<sup>4</sup>.  
<sup>1</sup>Division of Science and Mathematics, Eastern Oklahoma State College, Idabel, OK 74745, <sup>2</sup>Health and Natural Sciences, South Arkansas Community College, El Dorado, AR 71730, <sup>3</sup>Department of Biology, Pennsylvania State University, Shenango Campus, Sharon, PA 16146  
<sup>4</sup>9717 Wild Mountain Drive, Sherwood, AR 72120

**3:45**  
**NOTES ON TARANTULA (*APHONOPELMA HENTZI*) REPRODUCTION IN ARKANSAS**

Austin Jones<sup>1</sup>, David H. Jamieson<sup>2</sup>, and Terry L. Jamieson<sup>2</sup>.  
<sup>1</sup>NorthWest Arkansas Community College, <sup>2</sup>Crowder College – Cassville Campus

**4:00**  
**FIRST RECORD OF THE AMERICAN BURYING BEETLE, *NICROPHORUS AMERICANUS*, IN CLARK COUNTY, ARKANSAS**

Jess Kelly, Ouachita Baptist University

**4:15**  
**POPULATION GENOMICS OF THE MICROCRUSTACEAN *DAPHNIA PULEX***

Abraham Tucker, Ph.D.<sup>1</sup>, L. Clai Morehead<sup>1</sup>, and Matthew Ackerman<sup>2</sup>.  
<sup>1</sup>Southern Arkansas University, <sup>2</sup>Indiana University

**ORAL SESSIONS II: SATURDAY 8:30-10:00**

**PHYSICS AND ENGINEERING 207**  
**CHAIR: Matt Strasser**

**8:30**  
**THE DEVELOPMENT OF CRITICAL TECHNOLOGIES FOR NANO-SATELLITE PROXIMITY OPERATIONS AT ARKANSAS**

Adam Huang<sup>1</sup>, Edmond Wilson<sup>2</sup>, and Yupo Chan<sup>3</sup>.  
<sup>1</sup>University of Arkansas, Fayetteville, <sup>2</sup>Harding University, <sup>3</sup>University of Arkansas, Little Rock

**8:45**  
**BRINGING THE LEAST ACTION PRINCIPLE INTO INTRODUCTORY PHYSICS LABS**

Juan D. Serna, and Jared Gavin. University of Arkansas at Monticello

**9:00**  
**SOFTWARE & HARDWARE DESIGN FOR A HIGH RESOLUTION FIBER-FED VISIBLE/NEAR INFRARED SPECTROGRAPH**

Anna Shafer, Joshua Griffith, Brennan Thomason, and Edmond Wilson. Harding University

**9:15**  
**MARS ROVER 3-D CAMERA**

Aaron Burns, and Edmond Wilson. Harding University

**9:30**  
**REMOTE CONTROL OF MOBILE ROBOTIC VEHICLE VIA WEB-INTERFACE**

Douglas Bailey, Justin Nesselrotte, and Edmond Wilson. Harding University

**PHYSICS AND ENGINEERING 209**  
**CHAIR: Charles Wu**

**8:30**  
**SPECTROSCOPY OF EARTH'S ATMOSPHERE AND SOLAR RADIATION IN THE SPECTRAL RANGE OF 400 nm TO 1000 nm**

Stephanie Inabnet, and Edmond Wilson. Harding University

**8:45**  
**SHALE GAS DEVELOPMENT AND ITS ASSOCIATED IMPACTS ON ENERGY PATTERN IN THE UNITED STATES**

Qiaozi Zhao, and Charles Wu. Harding University

**9:00**  
**OPTIMAL EXPERIMENTAL DESIGN IN INVERSION WITH APPLICATION TO SUBSURFACE SENSING**

Yijun Yu<sup>1</sup>, and Nailong Guo<sup>2</sup>. <sup>1</sup>Philander Smith College, <sup>2</sup>Benedict College

**9:15**  
**DESIGNING A HIGH RESOLUTION FIBER-FED SPECTROGRAPH FOR SOLAR OBSERVATIONS**

Edmond Wilson, Brennan Thomason, Stephanie Inabnet, and Tamara Reed. Harding University

**9:30**  
**HIGH PRESSURE XENON TPC RADIATION BACKGROUND FOR NEXT EXPERIMENT**

Abdel Bachri<sup>1</sup>, Perry Grant<sup>2</sup>, Clayton Martin<sup>1</sup>, and Martin Hawron<sup>3</sup>.  
<sup>1</sup>Southern Arkansas University, <sup>2</sup>University of Arkansas, <sup>3</sup>University of Connecticut

**PLANT SCIENCE Liberty room**  
**CHAIR: Ann Willyard**

**8:30**  
**REDISCOVERY OF *PERSEA BORBONIA* VAR. *BORBONIA* (LAURACEAE), *PROSOPIS GLANDULOSA* VAR. *GLANDULOSA* (FABACEAE), AND *PINUS PALUSTRIS* (PINACEAE) IN ARKANSAS, WITH THREE NEW ANGIOSPERM SPECIES FOR ARKANSAS**

Tiffany Roeser<sup>1</sup>, James H. Peck<sup>2</sup>, and Brett E. Serviss<sup>1</sup>.  
<sup>1</sup>Henderson State University, <sup>2</sup>University of Arkansas at Little Rock

**8:45**  
**THE STATUS OF *CARDAMINE DISSECTA* (BRASSICACEAE) IN ARKANSAS**

Karen P. Fawley<sup>1</sup>, C. Theo Witsell<sup>2</sup>, and Marvin W. Fawley<sup>1</sup>.  
<sup>1</sup>University of Arkansas at Monticello, <sup>2</sup>Arkansas Natural Heritage Commission

**9:00**  
**THE PRESENCE OF ASIATIC SPECIES OF SEAWEED ON THE TEXAS COAST**

Randi Lovell, Megan Reed, and Troy L. Bray. Henderson State University

**9:15**  
**SERENDIPITOUS DATA FOLLOWING A SEVERE WINDSTORM IN AN OLD-GROWTH PINE STAND**

Don C. Bragg<sup>1</sup>, and Jess Riddle<sup>2</sup>.  
<sup>1</sup>USDA Forest Service, <sup>2</sup>University of Arkansas

**9:30**  
**ALGAE AND SNAILS INTERACT TO AFFECT LEAF DECOMPOSITION RATES**

Ali Mcleod, Steven Polaskey, and Sally Entekin. University of Central Arkansas

**POSTER PRESENTATION**

(Presenter is underlined)

**LIFE SCIENCES POSTERS**

**LS 38 EASTERN BLUEBIRD DIET, BEHAVIOR, AND WATER CONTENT OF PREY ITEMS**

Brandi Cansler, and Virginie Rolland. Arkansas State University Department of Biological Sciences

## Meeting Report

- LS 39 THE INTRODUCED DIRT-COLORED SEED BUG, *MEGALONOTUS SABULICOLA* (HEMIPTERA: RHYPAROCHROMIDAE) AND WATER BOATMEN, *SIGARA MATHESONI* (HEMIPTERA: CORIXIDAE): NEW FOR ARKANSAS.**  
S.W. Chordas III<sup>1</sup>, C.T. McAllister<sup>2</sup>, and H.W. Robison<sup>3</sup>.  
<sup>1</sup>Center for Life Sciences Education, The Ohio State University, 260 Jennings Hall, 1735 Neil Avenue, Columbus, OH 43210; <sup>2</sup>Science and Mathematics Division, Eastern Oklahoma State College, Idabel, OK 74745; and <sup>3</sup>9717 Wild Mountain Drive, Sherwood, AR 72120.
- LS 40 DETERMINING THE EFFECT OF ACTIN DEPOLYMERIZATION OF *DICTYOSTELIUM DISCOIDEUM* MITOCHONDRIA**  
Jordyn Cleavenger, Greg Berbusse, and Kari Naylor.  
University of Central Arkansas
- LS 41 NEW RECORDS OF ECTOPARASITES AND OTHER EPIFAUNISTIC ARTHROPODS FROM SCALOPUS AQUATICUS AND BLARINA CAROLINENSIS IN ARKANSAS**  
M.B. Connior<sup>1\*</sup>, L.A. Durden<sup>2</sup>, and C.T. McAllister<sup>3</sup>.  
<sup>1</sup>Health and Natural Sciences, South Arkansas Community College, El Dorado, AR 71730, <sup>2</sup>Department of Biology, Georgia Southern University, Statesboro, GA 30458, <sup>3</sup>Science and Mathematics Division, Eastern Oklahoma State College, Idabel, OK 74745
- LS 42 NATURAL HISTORY NOTES AND RECORDS OF VERTEBRATES FROM ARKANSAS**  
M.B. Connior<sup>1\*</sup>, R. Tumilson<sup>2</sup>, H.W. Robison<sup>3</sup>, C.T. McAllister<sup>4</sup>, and D.A. Neely<sup>5</sup>  
<sup>1</sup>Health and Natural Sciences, South Arkansas Community College, El Dorado, AR 71730, <sup>2</sup>Department of Biology, Henderson State University, Arkadelphia, AR 71999, <sup>3</sup>9717 Wild Mountain Drive, Sherwood, AR 72120 <sup>4</sup>Division of Science and Mathematics, Eastern Oklahoma State College, Idabel, OK 74745, <sup>5</sup>Tennessee Aquarium, Chattanooga, TN
- LS 43 FIRST RECORD OF RIBBON WORMS (NEMERTEA: TETRASTEMMATIDAE: PROSTOMA) FROM ARKANSAS.**  
P.G. Davison<sup>1</sup>, H.W. Robison<sup>2</sup>, and C.T. McAllister<sup>3</sup>.  
<sup>1</sup>Department of Biology, University of North Alabama, Florence, AL 35632; <sup>2</sup>9717 Wild Mountain Drive, Sherwood, AR 72120; and <sup>3</sup>Science and Mathematics Division, Eastern Oklahoma State College, Idabel, OK 74745.
- LS 44 SARCOPHAGEOUS INSECT ASSOCIATIONS AND SUCCESSION ON PIG CARRION DURING THE SUMMER IN CENTRAL ARKANSAS**  
Tyler Files, Brianne Baley, and Jess Kelly. Ouachita Baptist University
- LS 45 PREVALENCE OF SHIGA TOXIN-PRODUCING *ESCHERICHIA COLI***  
David F. Gilmore<sup>1</sup>, Harneet Kaur<sup>2</sup>, Monica Yarbrough<sup>3</sup>, and Donald Kennedy<sup>3</sup>. <sup>1</sup>Biological Sciences, <sup>2</sup>Environmental Sciences Program, <sup>3</sup>College of Agriculture, Arkansas State University
- LS 46 SAMPLING LOCAL FUNGAL DIVERSITY: A METHOD FOR FUNGAL SPECIES IDENTIFICATION USING DNA BARCODING**  
A.H. Harrington, A.F. Bigott, B.W. Anderson, M.J. Boone, S.M. Brick, J.F. delSol, C.A. Hotchkiss, R.A. Huddleston, E.H. Kasper, J.J. McGrady, M.L. McKinnie, M.V. Ottenlips, N.E. Skinner, K.C. Spatz, A.J. Steinberg, F. van den Broek, C.N. Wilson, A.M. Wofford and A.M. Willyard.  
Hendrix University
- LS 47 DETERMINATION OF URSOLIC ACID AND BIOACTIVITY IN *ILEX DECIDUA***  
Cynthia Holland, and Martin Campbell. Henderson State University
- LS 48 NEW HOST AND LOCATION RECORDS FOR THE BAT BUG *CIMEX ADJUNCTUS* BARBER 1939, WITH A SUMMARY OF PREVIOUS RECORDS**  
John Hunt<sup>1</sup>, Matthew E. Grilliot<sup>2</sup>, and Christopher G. Sims<sup>1</sup>.  
<sup>1</sup>University of Arkansas at Monticello, <sup>2</sup>Troy University Montgomery
- LS 49 LOCALIZATION STUDY OF BETA-HEXOSAMINIDASE IN THE SOCIAL AMOEBA *DICTYOSTELIUM DISCOIDEUM***  
Sanaa Talib Jawed, Azure Yarbrough, and John Bush.  
University of Arkansas at Little Rock
- LS 50 THE SUGAR AND AMINO ACID CONCENTRATIONS OF EXTRAFLORAL NECTAR IN FIVE COTTON CULTIVARS**  
Soolaf A. Kathiar, Janet Lanza, and Anindya Ghosh.  
University of Arkansas at Little Rock
- LS 51 NEW HOST RECORDS FOR MESOCESTOIDES SP. TETRATHYRIDIA (CESTOIDEA: CYCLOPHYLLIDEA) IN AMPHIBIANS (ANURA: BUFONIDAE, RANIDAE) FROM ARKANSAS.**  
C.T. McAllister<sup>1</sup>, M.B. Connior<sup>2</sup>, and S.E. Trauth<sup>3</sup>. <sup>1</sup>Science and Mathematics Division, Eastern Oklahoma State College, Idabel, OK 74745; <sup>2</sup>Health and Natural Sciences, South Arkansas Community College, El Dorado, AR 71730; and <sup>3</sup>Department of Biological Sciences, Arkansas State University, State University, AR 72467.
- LS 52 *HAEMOGREGARINA SP.* (APICOMPLEXA: HAEMOGREGARINIDAE), *TELORCHIS ATTENUATA* (DIGENEA: TELORCHIIDAE) AND *NEOECHINORHYNCHUS EMYDIS* (ACANTHOCEPHALA: NEOECHINORHYNCHIDAE) FROM MAP TURTLES (*GRAPTEMYS SPP.*), IN NORTHCENTRAL ARKANSAS.**  
C.T. McAllister<sup>1\*</sup>, C.R. Burse<sup>2</sup>, H.W. Robison<sup>3</sup>, M.B. Connior<sup>4</sup>, and M.A. Barger<sup>5</sup>.  
<sup>1</sup>Science and Mathematics Division, Eastern Oklahoma State College, Idabel, OK 74745; <sup>2</sup>Department of Biology, Pennsylvania State University, Shenango Campus, Sharon, PA 16146; <sup>3</sup>9717 Wild Mountain Drive, Sherwood, AR 72120; <sup>4</sup>Health and Natural Sciences, South Arkansas Community College, El Dorado, AR 71730; and <sup>5</sup>Department of Natural Sciences, Peru State College, Peru, NE 68421.
- LS 53 THE KILLING MECHANISMS OF NOVEL ANTIFUNGAL PEPTIDES**  
Gabriela Morris, David McNabb, and Yazan Akkam.  
University of Arkansas
- LS 54 EFFECTS OF MICROGRAVITY AND RADIATION ON ELASTIC MODULUS OF RAT FEMURS USING 3-POINT BENDING**  
O. Perkins<sup>1</sup>, A. Walker<sup>1</sup>, R. Mehta<sup>1</sup>, M. Dobretsov<sup>2</sup>, and P. Chowdhury<sup>3</sup>.  
<sup>1</sup>Department of Physics and Astronomy, University of Central Arkansas, <sup>2</sup>Department of Anesthesiology, University of Arkansas for Medical Sciences, <sup>3</sup>Department of Biophysics and Physiology, University of Arkansas for Medical Sciences
- LS 55 TOAD (ANURA: BUFONIDAE) LIMB ABNORMALITIES FROM AN AQUATIC SITE IN SCOTT, PULASKI COUNTY, ARKANSAS**  
Christopher S. Thiigpen, Dan Beard, and Stanley E. Trauth.  
Arkansas State University
- LS 56 SELECTION OF FATTY ACID DESATURASE 7 (*fad7-1*) SINGLE MUTANT PLANTS IN *ARABIDOPSIS THALIANA* USING SNP-PCR PRIMER**  
Kaleb L. Vaughn<sup>1</sup>, Carlos A. Avila<sup>2</sup>, and Fiona Goggin<sup>2</sup>.  
<sup>1</sup>Harding University, <sup>2</sup>University of Arkansas
- LS 57 MOLECULAR CLONING TO IMPROVE MITOCHONDRIAL FISSION AND FUSION ASSAYS**  
Olivia Vogel, Kalyn Holloway, and Kari Naylor.  
University of Central Arkansas

## Arkansas Academy of Science

**LS 58 NATURAL HISTORY NOTES AND NEW COUNTY RECORDS FOR OZARKIAN MILLIPEDS (ARTHROPODA: DIPLOPODA) FROM ARKANSAS, KANSAS AND MISSOURI.**

N.W. Youngsteadt<sup>1</sup> and C.T. McAllister<sup>2</sup>. <sup>1</sup>2031 S. Meadowview Avenue, Springfield, MO 65804; and <sup>2</sup>Science and Mathematics Division, Eastern Oklahoma State College, Idabel, OK 74745.

**CHEMISTRY & BIOCHEMISTRY POSTERS****CBC 15 EXPLORING COORDINATION CHEMISTRY OF TRIS(PYRAZOL-1-YL)METHANE**

Morgan Coleman, and Ganna Lyubartseva. Southern Arkansas University

**CBC 16 CRITICAL DISSOLVED OXYGEN LEVELS IN TRIBUTARIES OF THE BUFFALO NATIONAL RIVER**

John Kincaid<sup>1</sup>, Faron Usrey<sup>2</sup>, and Sherri Townsend<sup>1</sup>.

<sup>1</sup>North Arkansas College, <sup>2</sup>National Park Service

**CBC 17 ISOTHERMAL TITRATION CALORIMETRY FOR QUANTIFYING LACTOPEROXIDASE ACTIVITY IN MILK**

William Tolleson<sup>1</sup>, and Clifton Lewis, Jr.<sup>2</sup> <sup>1</sup>National Center for Toxicological Research, <sup>2</sup>Watson Chapel School District

**CBC 18 IRON-CARBON RELATIONSHIP BETWEEN BOND LENGTH AND BOND VALENCE**

Larkin McDaniel, and Franklin D. Hardcastle. Arkansas Tech University

**CBC 19 NEUTRALIZATION AND pH EFFECT OF MILK ON ASPIRIN SOLUTIONS**

Jordan Miller, Nikisha West, Fontaine Taylor, and Insu 'Frank' Hahn. Department of Chemistry, Division of Natural and Physical Sciences, Philander Smith College, Little Rock, AR

**CBC 20 WATER QUALITY STUDY AT LAKE COLUMBIA, AR**

Kara O'Neal, and Casey O'Hara

**CBC 21 EFFECTS OF MICROGRAVITY AND RADIATION ON ELASTIC MODULUS OF RAT FEMURS USING 3-POINT BENDING**

O. Perkins<sup>1</sup>, A. Walker<sup>1</sup>, R. Mehta<sup>1</sup>, M. Dobretsov<sup>2</sup>, and P. Chowdhury<sup>2</sup>, <sup>1</sup>University of Central Arkansas, <sup>2</sup>University of Arkansas for Medical Sciences

**CBC 22 MOLECULAR MODELING STUDIES OF PHYLOGENETICALLY SIGNIFICANT CAROTENOIDS OF OXYGENIC PHOTOTROPHS**

Ryan Reyes, and M. Jeffery Taylor. University of Arkansas-Monticello

**CBC 23 SPICES: TESTING THEIR ANTIMICROBIAL PROPERTIES AND SYNERGISM WITH PENICILLIN ON ESCHERICHIA COLI**

Gregory Tyler Rives. Southern Arkansas University

**CBC 24 SUPERAMPHIPHOBIC ALUMINUM ALLOY SURFACES**

Zubayda S Saifaldeen, Khedir R Khedir, and Tansel Karabacak, Department of Applied Science, UALR

**CBC 25 BIOCHEMISTRY OF CHROMIUM**

Shelby Sorrells, Silas Brown, and Edmond Wilson. Harding University

**CBC 26 MEASURING PAIN WITHDRAWAL THRESHOLD USING A NOVEL DEVICE OPERATING IN "PSEUDO-CONTINUOUS" MODE**

Azida Walker<sup>1</sup>, Nick Martinez<sup>1</sup>, Skipper Thurman<sup>1</sup>, Shelby Burns<sup>1</sup>, and Maxim Dobretsov<sup>2</sup>. <sup>1</sup>University of Central Arkansas; <sup>2</sup>University of Arkansas for Medical Sciences

**CBC 27 FRESHMAN FIND PHAGE!**

Jessica Ashcraft, Ruth Plymale, and Nathan Reyna. Ouachita Baptist University

**PHYSICS AND ENGINEERING POSTERS****P&E 22 A STUDY OF THE RELATION BETWEEN THE SPIRAL ARM PITCH ANGLE AND THE KINETIC ENERGY OF RANDOM MOTIONS OF THE HOST SPIRAL GALAXIES**

Ismaeel Al-Baidhany<sup>1</sup>, Marc Seigar<sup>1</sup>, Patrick Treuthardt<sup>1</sup>, Amber Sierra<sup>1</sup>, Ben Davis<sup>2</sup>, Daniel Kennifick<sup>2</sup>, Julia Kennefick<sup>2</sup>, and Claud Lacy<sup>2</sup>. <sup>1</sup>University of Arkansas at Little Rock, <sup>2</sup>University of Arkansas at Fayetteville

**P&E 23 A STUDY OF THE DISCREPANCY BETWEEN DYNAMICAL MASSES AND STELLAR MASSES IN SPIRAL GALAXIES**

Ismaeel Al-Baidhany<sup>1</sup>, Marc Seigar<sup>1</sup>, Patrick Treuthardt<sup>1</sup>, Amber Sierra<sup>1</sup>, Ben Davis<sup>2</sup>, Daniel Kennifick<sup>2</sup>, Julia Kennefick<sup>2</sup>, and Claud Lacy<sup>2</sup>. <sup>1</sup>University of Arkansas at Little Rock, <sup>2</sup>University of Arkansas at Fayetteville

**P&E 24 STRUCTURAL AND OPTICAL PROPERTIES OF ALUMINUM NANORODS FABRICATED BY GLANCING ANGLE DEPOSITION (GLAD)**

Rosure B. Abdulrahman, Mehmet F. Cansizoglu, and Tansel Karabacak. University of Arkansas at Little Rock

**P&E 2 RUTHERFORD SCATTERING – KINEMATICS AND ANGULAR DEPENDENCE**

Fawzi Alzahrani, Cruz Segura, Dawson Long, Forrest McDougal, Lawrence Benzmilller, R. Mehta, and A. Walker. University of Central Arkansas

**P&E 26 SYNCHRONIZATION LIMITS OF CHAOTIC CIRCUITS**

Christopher M. Church, and Stephen R. Addison. University of Central Arkansas

**P&E 27 SUPERHET CONVERTER FOR VLF 60kHz WWVB RADIO SIGNAL**

Kody Coleman, Juan D. Serna. University of Arkansas at Monticello

**P&E 28 A FRAMEWORK FOR MODELING USABILITY OF TEXT-BASED CAPTCHA**

Jasmine DeHart, Jalen Mayfield, and Samar Swaid. Philander Smith College

**P&E 29 STABLE FUZZY LOGIC CONTROL FOR NONLINEAR SIMPLE CHAOTIC MAPS**

Christopher Gillison, and Juan D. Serna. University of Arkansas at Monticello

**P&E 30 GEOMETRICAL VALIDATION OF LINEAR AND NONLINEAR DIOPHANTINE EQUATIONS**

Kyra Jerry, and Juan D. Serna. University of Arkansas at Monticello

**P&E 31 INVESTIGATION AND COMPARISON OF TWO BASIC AUDIO AMPLIFIER CIRCUITS**

Michael Kelley, and Dr. Charles Wu. Harding University

**P&E 32 TOTAL EXCITATION SCATTERING CROSS SECTION FOR POSITRONS SCATTERED BY MOLECULAR NITROGEN IN THE ENERGY RANGE (3 – 10 keV)**

H.L. Mansour<sup>1</sup> and W.A. Jabbar<sup>2</sup>. <sup>1</sup>Al – Mustansiriyah University, <sup>2</sup>University of Arkansas at Little Rock



## Meeting Report

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**P&E 33 DETERMINATION OF THE TOTAL EXCITATION SCATTERING CROSS SECTIONS OF MOLECULAR NITROGEN FOR POSITRONS AT ENERGIES UP TO (10 keV)**

H.L. Mansour<sup>1</sup> and W.A. Jabbar<sup>2</sup>. <sup>1</sup>Al-Mustansiriyah University, <sup>2</sup>University of Arkansas at Little Rock

**P&E 34 FABRICATION OF CDS NANORODS AND NANOPARTICLES WITH PANI FOR DYE-SENSITIZED SOLAR CELLS**

Muatez Zamil Mohammed, and Tar-Pin Chen. University of Arkansas at Little Rock

**P&E 35 APPLYING PROBABILISTIC MATCHING AND POST RESOLUTION CLERICAL REVIEW TECHNIQUES TO IMPROVE ENTITY RESOLUTION RESULTS**

Daniel Pullen, Pei Wang, and John Talburt. University of Arkansas at Little Rock

**P&E 36 GAMMA GAMMA COINCIDENCE**

Lucus Ratz, Doug Roisen, Jeremy Jacobs, Tanner Feeler, Azida Walker, and Rahul Mehta. Department of Physics and Astronomy, University of Central Arkansas

**P&E 37 X-RAY FLUORESCENCE AND MOSELEY'S LAWS OF NUCLEAR RADIATION SPECTRA**

T. Ryan Rogers, Hunter P. Ward, Nicholas L. Frederickson, Anthony D. Mitchel, Azida Walker, and Rahul Mehta. University of Central Arkansas

**P&E 38 CLASSIFICATION OF PARALLEL VORTEX-BODY INTERACTION**

Matthew Strasser, and R. Panneer Selvam. University of Arkansas

**P&E 39 NANOSAT SPECTROMETER**

Edmond Wilson, Mauris Orona, and Andrew Couch. Harding University

**P&E 40 ENERGY LOSS OF ALPHA PARTICLES IN COPPER FOILS**

Xavier Redmon, Gerard Munyazikwiye, Ashley Cotnam, Azida Walker, and Rahul Mehta. University of Central Arkansas