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CREATE @ **STATE**

A Symposium of Research, Scholarship & Creativity

**April 10, 2014**

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## FACULTY ADVISORY COMMITTEE

Agriculture & Technology .....	Tina Teague
Business .....	Jim Washam
Media & Communication .....	Po-Lin Pan
Education & Behavioral Sciences .....	Ryan Kelly
Engineering .....	Brandon Kemp
Fine Arts .....	Christopher Wilson
Humanities & Social Sciences .....	Debbie Chappel-Traylor
Nursing & Health Professions .....	Susie Snellgrove
Sciences & Mathematics .....	John Pratte
University College .....	Nikesha Nesbitt



Welcome to the fourth celebration of **Create @ State: A Symposium of Research, Scholarship & Creativity!** **Create @ State** is an annual event dedicated to the pursuit of research and creativity at Arkansas State University. The Office of Research and Technology Transfer is pleased to sponsor this event. The presentations showcase the scholarly activity from students all across our campus. I am proud of the intellect, creativity and innovation taking place at Arkansas State. This event is a testament to the rich learning experiences that are provided by our outstanding faculty. I hope you will participate in as many of the day's activities as possible. Congratulations Arkansas State students!

Best regards,



Andrew Sustich, P.h.D.

Vice Provost for Research and Graduate Studies



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# SCHEDULE

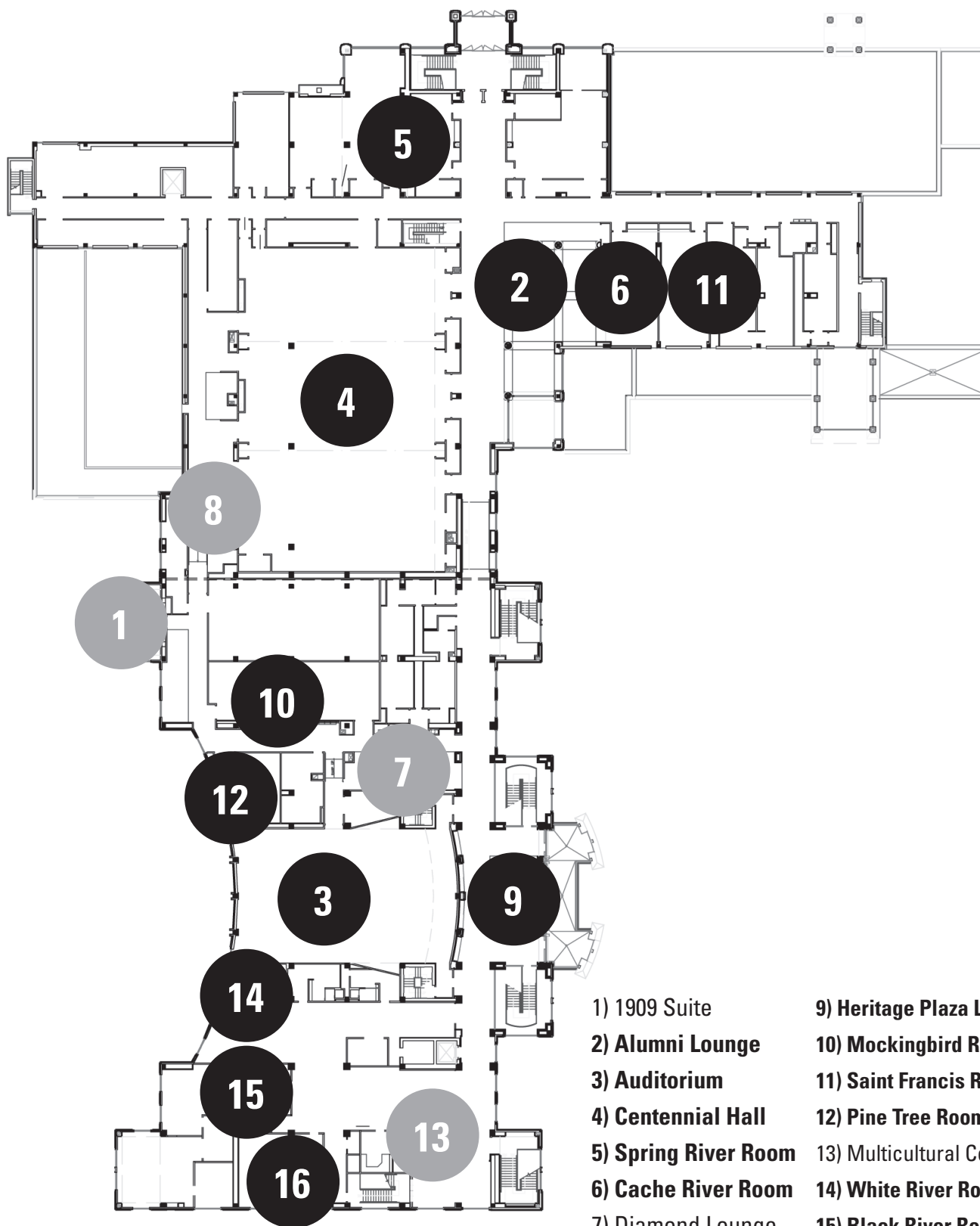
<b>8:00 – 9:00 A.M.</b>	<b>Poster Set-Up</b> (Poster Presenters Only) <b>Presenter Registration and Judges' Check-in*</b>	Centennial Hall Heritage Plaza Lounge
<b>9:00 – 9:30 A.M.</b>	<b>Welcome</b> <b>Refreshments</b>	Auditorium Alumni Lounge
<b>9:30 – 10:45 A.M.</b>	<b>Oral Presentations of Papers &amp; Research Findings</b> <b>Three Minute Thesis (3MT®) First Heat</b> <b>Poster Judging</b> (Faculty Judges Only)	Various Locations Spring River A & S Rooms Centennial Hall
<b>11:00 A.M. – 12:15 P.M.</b>	<b>Oral Presentations of Papers &amp; Research Findings</b> <b>3MT® Second Heat</b> <b>Poster Session**</b> (Students Present Posters)	Various Locations Spring River A & S Rooms Centennial Hall
<b>12:30 – 1:00 P.M.</b>	<b>Poster Removal</b> <b>Refreshments</b>	Centennial Hall Heritage Plaza Lounge
<b>1:00 – 2:15 P.M.</b>	<b>Oral Presentations of Papers &amp; Research Findings</b> <b>Creative/Artistic Presentations of Scholarly Works</b> <b>3MT® Final Heat</b>	Various Locations Arkansas River Room Spring River A & S Rooms
<b>2:30 – 2:45 P.M.</b>	<b>Art Gallery*** Talk</b>	Spring River U Room
<b>3:00 – 3:45 P.M.</b>	<b>Oral Presentations of Papers &amp; Research Findings</b> <b>Creative/Artistic Presentations of Scholarly Works</b> <b>ASU Film Festival</b>	Various Locations Arkansas River Room Auditorium
<b>4:00 – 4:30 P.M.</b>	<b>G60 Live Pitch Contest</b>	Auditorium
<b>4:30 – 5:00 P.M.</b>	<b>Awards Ceremony</b>	Auditorium

**\*All student presenters, faculty judges and room hosts must check-in at the registration desks in Heritage Plaza Lounge.**

**\*\*The Poster Session welcomes visitors during this time.**

**\*\*\*The Art Gallery welcomes visitors all day.**

# MAP (3RD FLOOR, STUDENT UNION)



- |                      |                              |
|----------------------|------------------------------|
| 1) 1909 Suite        | 9) Heritage Plaza Lounge     |
| 2) Alumni Lounge     | 10) Mockingbird Room         |
| 3) Auditorium        | 11) Saint Francis River Room |
| 4) Centennial Hall   | 12) Pine Tree Room           |
| 5) Spring River Room | 13) Multicultural Center     |
| 6) Cache River Room  | 14) White River Room         |
| 7) Diamond Lounge    | 15) Black River Room         |
| 8) Green Room        | 16) Arkansas River Room      |

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## PRESENTATION SCHEDULE

### ORAL PRESENTATIONS

#### WHITE RIVER ROOM

##### Social Media, Self-Esteem and Sexuality

- Social Media and Civic Discourse Among Students of the University of Ghana  
*Frank Boadi*
- Engineering the Presidency: The Technology of Presidents as Metaphor for Their Administration  
*Catherine Harthorn*
- An Examination of Social Media for News Information Over TV and Internet Websites Among College Students  
*Taylor Pannell, Skylar Cothren*
- The Selfie Generation: How Dove's 'Real Beauty' Campaign Brought a Whole New Meaning to Self-Image  
*Ellen Hakenewerth, Rebekah Hickman*
- Marketing to Genders: A Study into the Differences Between Male and Female Reactions to Violence and Sexuality on Television Commercials  
*Ellen Hakenewerth, Rebekah Hickman*

9:30 A.M.-  
10:45 A.M.



#### BLACK RIVER ROOM

##### Exploring the Influence of Individual Perspectives

- To Free or Not to Free: Crime Control vs. Due Process Orientation  
*Megan Mitchell, Maya Williams, Alex Swenson*
- Seeking the Perfect Match: The Impact of Outcome Severity on Facial Identification  
*Barret Schein*
- Stereotypes of Adolescents  
*Molly Gibson, Alex Liebhaber*
- Analysis of Stalking Amongst Adolescents  
*Cory Green*

#### ARKANSAS RIVER ROOM

##### Improving Outcomes for Health and Quality of Life

- Fluent Conversation as a Metric for Hearing Aid Benefit  
*Morgan Caples*
- Arkansas State University Hippotherapy Center: A Creative Activity  
*Ashley Morgan, Shelley Burgess, Candace Chapman, Holly Harris, T.J. Martinez*

- Comparison of Written Medical Information Provided by Medical Clinics and Pharmacies in Two Counties in Northeast Arkansas

*Kayla Spray*

- Emergency Department Nurses' Perceptions of Decontamination

*Randi Wright*

## MOCKINGBIRD ROOM EAST & WEST

### Pests and Parasites

- Comparison of Field Methods for Estimating Fruit Retention for Insect Pest Control Decisions in Cotton

*Justin Smith*

- Effect of Temperature and Rice Fraction on Red Flour Beetle (*Tribolium castaneum*) Development

*Rachel Hampton*

- Effects of Environmental Factors on the Abundance and Distribution of *Tribolium castaneum* in Rice Mills in Northeast Arkansas

*Martine Patiance Bowombe Toko*

- Red Imported Fire Ant: The Global Environmental and Economic Impacts of the Invasive Species on Wildlife, Agriculture, and People

*Kelli Crow*

- Parasitism by *Anilocra haemuli* on French grunt (*Haemulon flavolineatum*) is Associated With Host Social Affiliation and Aggregation Size

*Rachel Welicky*

## CACHE RIVER ROOM

### Play It Safe: Injury Prevention and Treatment in Sports

- Injuries Sustained in Boxing vs. Mixed Martial Arts

*Aaron Schenk, Jordan Fowler*

- Does Warming Up Prevent Injuries for Weightlifters?

*Seth Parker*

- Does Energy Consumption Really Help Runners?

*Buynar Kristen*

- Tommy John Surgery: Same Procedure, Different Results

*Chris Richardson*

- Can Weather Have an Influence on Mood?

*Hunter Hope*

- Differential Effects of Cancer

*Pierre Brown*



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## WHITE RIVER ROOM

### Non-Linear Springs and Numerical Schemes: These are a Few of My Favorite Things

- Motion of a Non-Linear Spring with Dynamic Contact  
*Jay Mayfield*
- Numerical Approaches to Thermoelastic Rods with Dynamic Contact  
*Natanya Clark*
- Continuous Everywhere But Differentiable Nowhere Functions  
*DeLong Li*
- Applying Exterior Matrix Method to an Inclined Cable Problem  
*Matthew Manning*
- A New Technique for Multiple Comparison Testing  
*Jared Wolf*

11:00 A.M.-  
12:15 P.M.



## BLACK RIVER ROOM

### Investigations in Energy Efficiency

- Investigation of Rheological Properties of Asphalt Rubber Towards Sustainable Use of Scrap Automobile Tires  
*Biswajit Bairgi*
- Production and Characterization of Pellets Made from Arkansas Crop Residues  
*Shyam Thapa*
- Theoretical Modeling for Dynamic Behavior in Vanadium Redox Flow Battery  
*Ryan Listenbee*
- Thermal Impact of Cyclic Operations on Small and Medium Size Combined Cycle Power Plants at Low Load Factor  
*Derek Johnston*
- The Life of a Wind Farm  
*Myranda Thomen*

## ARKANSAS RIVER ROOM

### The Learning Environment

- Children's Experiences at a Science Fair  
*Hayley Beall, Ezparza Sandra*
- Do Religious Groups Have The Right To Use Public School Facilities?  
*Caleb Sugg*
- Teachers Who Write and Their Influence on Student Writings: Theoretical Support and Observations  
*Hannah Gilliam*
- Opening Our Doors: Using Writing Center Tutor-Facilitated Writing Groups for Sites of Strategic Collaboration  
*Skye Roberson, Michal Horton*



- Similarities and Differences Between International and Local Students: An Investigation of Value, Trust, Commitment, Quality, and Loyalty

*Mao Ninomiya*

## **MOCKINGBIRD ROOM EAST AND WEST**

### **Literature That Shapes Society**

- *The House of Mirth v. Sex and the City*  
*David Beck*
- Reading *Never Let Me Go* Through the Lens of Judith Butler  
*Emily Hill*
- An Analysis of Susan Bordo's *Unbearable Weight*  
*Skye Roberson*
- Fate in John Milton's *Paradise Lost*  
*Leslie Malland*
- Oppression of the Female in *The Tenant of Wildfell Hall*  
*Erin Swafford*
- *The Groundlings*  
*Brittany Roe*

## **CACHE RIVER ROOM**

### **Ethics of Collegiate and Celebrity Athletes and Their Coaches**

- When Do Unethical Decisions Cost Athletes Endorsements?  
*Tessa McGill, Felicia Rehr*
- Branding: The Effect of Using Professional Athletes in Advertising  
*Kyle Drake*
- Paying College Athletes  
*Mallory Perry, Kaley Golden*
- College Athletes Rights of Publicity: Finding the Perception of Athletes About Their Right to Use Social Media  
*James Hines*
- Coaching Pressure Causes Unethical Decision Making  
*Cooper Jarius, Brook Jason*
- Does Social Economic Class Affect Sport Participation?  
*Bryan Bogan, Terry Jenkins, Kyle Coleman, Brian Crayton*

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## WHITE RIVER ROOM

### Mindfulness, Motivation and Coping With Crisis

- The Effects of Weekly Mindfulness Sessions: A Case Study  
*Ezra Rodgers*
- A Service-Learning Approach to Student-Focused Motivational Interviewing  
*Ryan Lee, Michelle Cebaba*
- Chronic Oral Nicotine Intake Impacts Nicotine Metabolism But Not the Circulating Estradiol Levels in Female Rats  
*Swapnali Halder*
- Reconstruction in Arkansas  
*Ashley Jackson*
- The Real Trouble with a Housing Bubble  
*Shawnequa Clark*

1:00 P.M.-  
2:15 P.M.



## BLACK RIVER ROOM

### Show Me the Money: Financing in Athletics

- Increasing Throwing Velocity in Baseball Pitching  
*Kaleb Brown*
- Sources of Collegiate Athletic Facility Funding  
*Ryan Pett, Carlos McCants*
- Alternative Solutions to the Funding Crisis in High School Athletics  
*Felicia Rehr, Tessa McGill*
- The Struggle Between Athletic Achievement and NCAA Justice  
*Katherine Gonzalez, Trey Finn*
- The Cost of Development: Brand Equity and the Impact of ASU Football Corporate Sponsorships  
*James Kines, Kyle Drake*

## MOCKINGBIRD ROOM EAST AND WEST

### Conserving Water Supply

- Monitoring of Water Quality to Determine Effectiveness of the Best Management Practices (BMPs) for the Larkin Creek Watershed  
*Sarah Vogt*
- Water Quality Impairments of the Cache River, Arkansas: Who's to Blame  
*Mary Kilmer*
- Comparing Water Quality of Agricultural and Non-Agricultural Streams  
*Nicole Poe*
- The Drying of the Aral Sea  
*Inna Mukhametova*
- Asian Carp in the Mississippi: Threatening our Great Lakes Ecosystem  
*Laura McCain*

## WHITE RIVER ROOM

### Physics Instrumentation: Design and Assembly

- Electronics of a Condensed Solar Radiation Trough  
*Matthew Johnson, John Ballard*
- Cost-Efficient DIY Solar Trough  
*Clayton Kardas, Kayla Watkins, Roman Smith*
- Construction of an Optical Parametric Oscillator  
*Matthew Johnson*
- Differential Pump System  
*Kayla Watkins*

## BLACK RIVER ROOM

### Particles and Light

- Sustainable Hydrogen Production Using Doped Carbon in Photoelectrolysis  
*Keith Arnoult*
- Like-Charged Particle Attraction  
*Evan Barwick*
- Optical Pressures and Energies from Relativistic Electrodynamics  
*Sheppard Cheyenne*
- Hot Quark-Gluon Plasma and Its Work During Expansion  
*Jay Mayfield*

## MOCKINGBIRD ROOM EAST & WEST

### Advancing Health Through Bioactive Plant Products

- Biosynthesis and Purification of Arachidin-1 from Hairy Root Cultures of Peanut  
*Christopher Tollett*
- Deciphering the Biosynthesis of Stilbenoids in Peanut  
*Tianhong Yang*
- Recombinant Expression of a Thermostable Endo-Arabinase for Extraction of Functional Oligosaccharides from Plant Cell Wall Polysaccharides  
*Ningning Zhang*
- Characterization of an Arabidopsis L-Gulonolactone Oxidase (GulLO) in *Nicotiana benthamiana*  
*Siddique Aboobucker*

3:00 P.M.-  
3:45 P.M.



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## CACHE RIVER ROOM

### Composers and Conductors

- Lightning Talk: Creating a Performer's Analysis of a Post-Tonal Work of Paul Hindemith  
*Micah Glover*
- Patrick Gilmore: Immigrant, Musician and Purveyor of American Culture and Traditions  
*Daniel Harrelson*
- Streamlining Your Rehearsals with Conducting-Gesture Instruction  
*Tyler Casey*

## CREATIVE/ARTISTIC PRESENTATIONS

### ARKANSAS RIVER ROOM

#### Creative and Artistic Presentations on Sexuality

- Effects of LGBT Bullying
- The Role that Gender Plays in Coming Out and the LGBT Community
- Coming Out in Context
- Violence Against Homeless Sexual-Minority Youth
- The Heart Wants What It Wants: An Examination of Long-Term Heterosexual and Homosexual Relationships
- How His Story Became Our Story: LGBTQIA's Respond to the Death of Matthew Shepard

1:00 P.M.-  
2:15 P.M.



### ARKANSAS RIVER ROOM

#### Illustrating Life – Through Story, Film and Music

- 2014 Kuwait Media Tour  
*Devan Harper*
- Nightmare in the House of Fiction  
*Katey Cravens*
- The House of Demoe  
*Reece Jones*
- Art(isms): A Performance Analysis and Composer Biography  
*Jon Stevenson*
- How to Prepare for a Solo Competition  
*Cody Hutchison*

3:00 P.M.-  
3:45 P.M.





## A-STATE FILM FESTIVAL AUDITORIUM

Press Rewind: Reliving Our Violent Past

3:00 P.M.-  
3:45 P.M.



### WESTSIDE SHOOTING

On March 28, 1998, two boys, Mitchell Johnson and Andrew Golden, stole a family van from Johnson's home and guns from Golden's grandfather's house, and attacked students and teachers in the schoolyard at Westside Middle School. By the end of the shooting rampage, five were dead and 11 injured. One of the deceased was sixth-grade teacher, Shannon Wright, who died shielding a child with her body. In a video which shows never-before publicly viewed footage of the incident, four Arkansas State students, including Zane Wright, son of Shannon, examine the incident. This video was created as part of their work in a Making Connections class for Dr. LaQuita Saunders. (Length: 14 minutes)  
Student Producers: *Ashley Fox, Taylor Gambill, Shelby Webb, Mitchell (Zane) Wright*

### TWISTER: A LOOK AT MAY 2013, MOORE, OKLAHOMA, TORNADO

Monday May 20th, 2013 a tornado tore through Moore, Oklahoma, leaving a trail of damage not seen in Moore since 1999. This tornado had a ranking of EF5 on the enhanced Fujita Scale; most deaths occur during EF4 and EF5 tornadoes. The powerful tornado touched down at Newcastle, Oklahoma at 2:56 in the afternoon. The storm, at its peak, reached wind speeds of over 200 miles an hour and was 1.3 miles in width. It traveled a total of 17 miles on the ground in the short time it was active. This video explored the twister itself, plus the immediate aftermath. This video was created by three freshmen students as part of their work in a Making Connections class for Dr. LaQuita Saunders. (Length: 7 minutes)  
Student Producers: *Stephen Clark, Sammy Reynolds, Julia Williams*

### THE BATTLE FOR FREEDOM

Michael Bowman, assistant professor, Creative Media Production

This documentary traces the journey for freedom by African-Americans from the Civil War era to the 2013 dedication of Freedom Park in Helena, Ark. In 1862, freedom seeking slaves fled plantations and joined Union troops in their march into Arkansas, ultimately establishing camps in Helena. Soon after, President Abraham Lincoln issued the Emancipation Proclamation in 1863. In the Battle of Helena, former slaves joined Union forces in defending their new freedoms. The site of this battle for freedom is now the site for Freedom Park. The film features interviews with noted historians, Civil War re-enactors, and Helena community members who discuss the impact of Freedom Park on the understanding and interpretation of the African-American role in Civil War and American history. (Length: 22 minutes)

\* Supported with grant funding from the Arkansas Civil War Sesquicentennial Commission.

Arkansas State student production assistants: *Jennifer Wineland, Tracy Wineland, Yiyang Li and Anthony Holmes*



# CREATIVE/ARTISTIC PRESENTATIONS

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ABSTRACTS LISTED IN ALPHABETIC ORDER BY LEAD PRESENTER



**Corder, Jessica** – Studio Art, emphasis in Painting/Drawing

jessica.devers@smail.AState.edu

## **STRANGERS**

I examine the relationship of the viewed and the viewer through the conventions of portraiture. Portraits of women have historically been created to be pleasing to the male eye. My portraits subvert this passive relationship by making the observer self-conscious, aware of the act of viewing. These works explore how anonymity and vulnerability upset voyeurism through the manipulation of poses and spaces. The theatre I construct is intended to intrigue and allure, creating a guarded intimacy in each portrait that both invites and repels the viewer.

*Faculty Mentor: Melissa Wilkinson, mwilkinson@AState.edu*

**Costello, Liam** – Social Work, Undergraduate

liam.costello@smail.AState.edu

## **HOW HIS STORY BECAME OUR STORY: LGBTQIA'S RESPOND TO THE DEATH OF MATTHEW SHEPARD**

This multimedia presentation will consist of a compilation of interviews conducted with members of the LGBT community who are at least 30 years old. The interviews will focus on the impact of hate crimes on the group and explore how Matthew Shepard's violent death affected a generation of the LGBT community. Interview subjects will be asked to recount what they remember about Matthew Shepard, how it impacted them at the time, and share what they feel are the long term consequences of hate crimes.

*Faculty Mentor: Kathleen Carrick, Social Work, krcarrick@AState.edu*

**Cravens, Katey** – English, Undergraduate

katey.cravens@smail.AState.edu

## **NIGHTMARE IN THE HOUSE OF FICTION**

"Nightmare in the House of Fiction" is a short film that blends elements from several well-known short stories into what can only be defined as nonsense. A student falls asleep while studying. What occurs within her Halloween-fueled dream makes very little sense and is, at times, impossible to explain. However, there are some familiar encounters with plotlines from *The Yellow Wallpaper*, *The Nose*, *A Rose for Emily*, *The Blue Hotel*, and many other stories.

*Faculty Mentor: Cyndy Hendershot, English, chendershot@AState.edu*

**Daniels, Tayler** – Biological Sciences, Undergraduate

tayler.daniels@smail.AState.edu

## **EFFECTS OF LGBT BULLYING**

The topic of bullying within the school environment has received a lot of attention recently. LGBT students, in particular, are at risk for all forms of bullying and have an increased occurrence of suicide attempts due to bullying from their peers. Yet bullying linked to issues of perceived or actual sexual orientation is often minimized or not addressed. This is of particular concern for vulnerable adolescents in the South. This presentation will address research on the effects of LGBT bullying and recommended measures to protect students.

*Faculty Mentor: Kathleen Carrick, Social Work, krcarrick@AState.edu*







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**Harper, Devan** – Media & Communication, Undergraduate

devan.harper@smail.AState.edu

## **2014 KUWAIT MEDIA TOUR**

Four Arkansas State media students went on a media tour to Kuwait. The tour was designed to introduce students to Middle-Eastern Culture and to show how media is used abroad. The presentation is part oral / part video. The student, will explain media in the Middle East and then show a video of their experience in Kuwait.

*Faculty Mentor: Gil Fowler, Media and Communication, gfowler@AState.edu*

**Herring, Braden** – English, Undergraduate

braden.herring@smail.AState.edu

## **COMING OUT IN CONTEXT**

Coming out for queer youth has, for most, been a daunting task. This process can completely sever ties to family and social groups. However, imagine a world in which the process of “coming out” does not exist. There is no reason to come out, because people are free to simply be themselves without feeling there needs to be a “closet” in which to hide their own individuality. This video explores the coming out stories of local youth and the effects this had on their surroundings and mental health. It also explores their thoughts on the future relevance of the process in the social context of LGBT equality in the United States.

*Faculty Mentor: Kathleen Carrick, Social Work, krcarrick@AState.edu*

**Hutchison, Cody** – Music Education and Music Performance, Undergraduate

cody.hutchiso@smail.AState.edu

## **HOW TO PREPARE FOR A SOLO COMPETITION**

Cody Hutchison competed in the MTNA Young-Artist Brass Solo Competition on November 9, 2013, and won his category in the state of Arkansas. As winner of the state competition, he was invited to compete in the South Central Division on January 19, 2014 and placed second in his category. Included in his program were four solo pieces of various musical styles. This presentation will consist of performances of selected competition pieces and a discussion of proper preparation and practice techniques used to achieve success at high levels of competition.

*Faculty Mentor: Ed Owen, Music, eowen@AState.edu*

**Jarvis, Brodie** – Interdisciplinary Studies, Undergraduate

jarvis.brodie@smail.AState.edu

## **VIOLENCE AGAINST HOMELESS SEXUAL-MINORITY YOUTH**

The purpose of my presentation is to discuss the violence that befalls homeless LGBTQ adolescents. My discussion stems from the article “High Burden of Homelessness Among Sexual-Minority Adolescents: Findings From a Representative Massachusetts High School Sample” (Corliss, Goodenow, Nichols & Austin, 2011).

*Faculty Mentor: Rebecca Barrett-Fox, Sociology, rbarrettfox@AState.edu*



**Jones, Reece** – Creative Media Production, Undergraduate

reece.jones@smail.AState.edu

### ***THE HOUSE OF DEMOE***

*The House of Demoe* is an original short story about a man who buys a house, not knowing that it is haunted by the ghosts of two families. There are 10 ghosts spread across the house's 10 rooms. As he encounters each ghost he comes closer to fully understanding the reason for their deaths and why they haven't moved on.

*Faculty Mentor: Cyndy Hendershot, English, chendershot@AState.edu*

**Martin, Megan** – Business Management, Undergraduate

meganj.martin@smail.AState.edu

### **LAUNCHPAD INVENTS, LLC: THE WEDGER PILLOW**

LaunchPad Invents, LLC., is a new company specializing in making innovative medical products, specifically, the Wedger Pillow. The Wedger Pillow is a side sleeping support pillow designed to help those on bed rest, pregnant women, post-surgery patients, babies, and those suffering from sleep apnea.

*Faculty Mentor: Erick Chang, Business Management, echang@AState.edu*

**Phillips, Cassie** – Biological Sciences, Undergraduate

cassie.phillips@smail.AState.edu

### **THE ROLE THAT GENDER PLAYS IN COMING OUT AND THE LGBT COMMUNITY**

This presentation will address the issue of coming out by gender and how gender stereotypes affect the LGBT community. A multimedia presentation will consist of interviews of individuals who are currently OUT for their perspective on how coming out may have different consequences by gender. Issues addressed in the presentation include society's willingness to accept gay men and lesbians as well as personal beliefs about gender roles.

*Faculty Mentor: Kathleen Carrick, Social Work, krcarrick@AState.edu*

**Stevenson, Jon** – Music, Graduate

jon.stevenson@smail.AState.edu

### **ART(ISMS): A PERFORMANCE ANALYSIS AND COMPOSER BIOGRAPHY**

The goal of this study was to present a brief historical account on the life Randall Standridge and to discover conducting parameters and techniques by engaging in a performance analysis of his yet to be published work, Art(isms). This study utilized interviews from Standridge himself, the people who know him on a personal and professional level, and the individuals responsible for the commission of his work, "Art(isms)." The study included the biography of Standridge's life and career. This study also investigated Art(isms) by discussing it's purpose for being written and it's performance debut. The study also included a look at all three movements of the piece Pointillism, Surrealism, and Abstract Expressionism and explored the future implications for Art(isms).

*Faculty Mentor: Timothy Oliver, Music, tolover@AState.edu*





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**Sullivan, Micheal** – Business, Undergraduate

micheal.sullivan@smail.AState.edu

## **GRANADA CHOCOLATES IN NEA**

Our team will delegate one member to pitch our idea of bringing Granada Chocolates from Guatemalan to Northeast Arkansas (NEA) markets. Currently Granada Chocolates does not sell anywhere in the USA, so this is a great opportunity to introduce their chocolates into the USA market.

*Faculty Mentor: Erick Chang, Business Management, echang@AState.edu*

**White, Skyler** – Psychology, Undergraduate

skyler.white@smail.AState.edu

## **THE HEART WANTS WHAT IT WANTS: AN EXAMINATION OF LONG-TERM HETEROSEXUAL AND HOMOSEXUAL RELATIONSHIPS**

Evolutionary theory explains heterosexual mating preferences to a certain degree, but largely overlooks the LGBTQI population. Positive psychology suggests that characteristics like authenticity and dependability are more important than evolution-based traits such as appearance and social status in a long-term romantic partner. This multimedia presentation includes convenience interviews conducted with a sample of heterosexual and homosexual couples in committed relationships to provide insight into their similarities and differences, and highlight the homogeneity of traits a person desires in a partner, regardless of sexual orientation.

*Faculty Mentor: Timothy Oliver, Music, tolover@AState.edu*



# ORAL PRESENTATIONS

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ABSTRACTS LISTED IN ALPHABETIC ORDER BY LEAD PRESENTER





**Aboobucker, Siddique** – Molecular Biosciences, Graduate

siddique.aboobucker@smail.AState.edu

### **CHARACTERIZATION OF AN ARABIDOPSIS L-GULONO-1,4-LACTONE OXIDASE (GULLO) IN NICOTIANA BENTHAMIANA**

Vitamin C (AsA), the most abundant water-soluble antioxidant, is essential for plant and animal health. There are four biosynthetic pathways for AsA in plants: the mannose/galactose, gulose, galacturonate and myo-inositol routes. Our group has made significant progress in the study of the first 3 enzymes of the inositol pathway to AsA and this work focuses on the last, L-gulono-1,4-lactone oxidase (GulLO). There are 7 putative GulLOs in Arabidopsis, and bioinformatic analyses narrowed down our interest in AtGulLO5. Genetic constructs were developed and conditions optimized for expression of this gene in wood tobacco. The purified recombinant AtGulLO5 is specific for L-gulono1,4-lactone, and does not accept other enantiomers. This is the first report of a true GulLO in plants.

*Faculty Mentor: Argelia Lorence, Chemistry and Physics, alorence@AState.edu*

**Arnoult, Keith** – Technology, Undergraduate

keith.arnoult@smail.AState.edu

### **SUSTAINABLE HYDROGEN PRODUCTION USING DOPED CARBON IN PHOTOELECTROLYSIS**

Hydrogen is the most abundant element on the planet. It can be used as a source of energy in a variety of applications. Unfortunately, there is no sustainable method for hydrogen production. In this research we explored hydrogen production using photo-electrolysis where solar energy is used to split water molecules into hydrogen and oxygen. There are many materials that have been investigated for hydrogen production, but currently there is no material that can efficiently produce hydrogen. The material used in this study was a carbon-based material composed of phosphorus and nitrogen co-doped mesoporous carbon (PNDC). Our preliminary results with this material show that PNDC is potentially a good material for sustainable hydrogen production.

*Faculty Mentor: Rajesh Sharma, Technology, rsharma@AState.edu*

**Bairgi, Biswajit** – Civil Engineering, Graduate

biswajit.bairgi@smail.AState.edu

### **INVESTIGATION OF RHEOLOGICAL PROPERTIES OF ASPHALT RUBBER TOWARDS SUSTAINABLE USE OF SCRAP AUTOMOBILE TIRES**

About 300 million scrap tires are generated each year in United States, and their disposal poses a huge threat to the national economy and environmental safety. The objective of this study is to assess the viability of scrap tires to prepare new asphalt rubber (AR) by investigating their rheological properties. Though some states carried out limited studies, an AR study is needed for conditions prevailing in Arkansas. Thus, three different amounts (10, 15 and 20%) of ground tire rubber (GTR) were mixed with a base binder, and their mechanistic properties are being evaluated. From viscosity and penetration test data, it is seen that 20% GTR-modified asphalt is about 10 times stiffer than the base binder. Preliminary data suggests that GTR is a viable alternative of commonly used polymers.

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## **LIKE-CHARGED PARTICLE ATTRACTION**

Particle attraction is normally observed between objects of opposing charges. Recent work, though, has emerged that has suggested the possibility of attraction between like-charged particles under special circumstances. Such interactions have received considerable attention in the fields of physics, chemistry, interface and colloid science, electromagnetics, nanotechnology, and others. The prospective phenomena surrounding these interactions raise serious implications for applications in science and technology. More significant of these interactions is their optical response; manipulation of this may lead to great advances in materials science and optical device technology. This research investigates the case of two or more charged particles in an electrically neutral zone.

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## **CHILDREN'S EXPERIENCES AT A SCIENCE FAIR**

Informal science education experiences can be a critical motivating experience for sparking such interest in science, technology, engineering and math (STEM) fields. One of the more common extra-curricular STEM experiences that children may engage in is the "science fair." Participating in a science fair is thought to increase student interest and motivation in STEM. However, it is surprising how little research has been conducted on the subject. The goal of the current research was to examine why children enter science fairs and their experiences in the fair. Developmental and gender differences in experiences will be explored.

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## **THE HOUSE OF MIRTH V. SEX AND THE CITY**

Marriage is a consistent theme throughout twentieth century literature. Edith Wharton's 1905 novel, *The House of Mirth*, presents marriage in the urban setting of Manhattan through the lives of the upper crust. Appearing almost one century later, Candace Bushnell's collection of essays and the subsequent television series, *Sex and the City*, portrays marriage and relationships in the same setting as Wharton's work. In analyzing these very popular works of literature, the reader will recognize the commodification of marriage in the capitalist society of upper-class Manhattan and will see the progression and the lack of progression in the attitude of marriage, relationships and women across a century.

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## **SOCIAL MEDIA AND CIVIC DISCOURSE AMONG STUDENTS OF THE UNIVERSITY OF GHANA**

In many advanced democracies, the impact of new media technologies is well documented. The evidence of internet and social media use, reflected in findings from Western societies, shows that these new media tools have both positive and negative impacts, notably towards facilitating political communication and civic engagement. While access to and use of the Internet along with its adjunct tools has grown in Ghana, academic literature supporting these occurrences is in an emerging phase. This qualitative study explored social media use among students of the University of Ghana for political communication relying on the Social Capital and Deliberative theories. The findings suggest that social media may be fostering civic and political discourse.

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## **DOES SOCIAL ECONOMIC CLASS AFFECT SPORT PARTICIPATION?**

Previous research has shown that socio-economic class can be a main determinant of sport participation. Individuals from higher social-economic class can affect modes of transportation available to an individual, quality of available facilities, amount of family involvement, and available time extracurricular activities. To conduct our study we will randomly survey a select group of students from different colleges on Arkansas State's campus. Our survey will include basic demographics, social class information, offered sport opportunities, and current and past sport involvement. We will conduct qualitative research. Studying these variables and their reoccurring patterns will help us gain a better understanding of whether or not economic class is linked to sport participation.

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## **EFFECTS OF ENVIRONMENTAL FACTORS ON THE ABUNDANCE AND DISTRIBUTION OF *TRIBOLIUM CASTANEUM* IN RICE MILLS IN NORTHEAST ARKANSAS**

The red flour beetle, *Tribolium castaneum*, has been found associated in grain storage facilities where they damage grains leading to economic losses. However, the abundance and distribution of this pest can vary over time and depends on environmental factors (i.e. temperature and light). To better understand the seasonal and temporal distributions of the red flour beetle, we conducted a study from June 2012 to June 2013 to examine their distributions in four rice mills. Beetles were captured using pheromone-baited dome traps placed inside and outside of mills. Temperature and amount of light was measured at each trap. Results of this research can be used as baseline data to put in place good insect monitoring programs at these facilities.

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## **INCREASING THROWING VELOCITY IN BASEBALL PITCHING**

Throwing a baseball is a full-body powerful feat done by a player. It takes muscles, starting from your calves, delivering power up through your body to the shoulder and out through the baseball, to achieve high velocities. This paper reviews information on the biomechanics of throwing a baseball, common injuries, injury prevention and rehabilitation, training components, and a yearlong strength and conditioning program. The literature reviewed identified methods to increase throwing velocity and prevent injury to the body from throwing. This literature review will provide players, coaches and parents with reliable, relevant information to help train for increased throwing velocity.

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## **DIFFERENTIAL EFFECTS OF CANCER**

Cancer – what is it? How do we contract it, is it in our genes, or is it just a type of disease that develops. Why do we call this disease the silent killer? Who gets cancer, how does cancer affect different age groups; what are some of the exercises we can do to help patients with this disease? What are some of the different types of cancers, and are they gender specific? Are there ways to identify subtypes of cancer to help prevent the spread of disease and length of survival? We have done a study on the many types of cancers and their effects on youth versus older patients. We learned how cancer affects people differently. We studied effective treatments, particularly exercise and healthy diet that is specific to the type of cancer a patient has.

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## **FLUENT CONVERSATION AS A MEATRIC FOR HEARING AID BENEFIT**

This study investigated hearing aid benefit as demonstrated by a measure of fluent conversation. Additionally, the study sought to explore the relationship between audibility index and conversational fluency. Fluent communication consists of words flowing smoothly from one conversation partner to the next and can be derived by calculating the total number of words spoken within a conversation and dividing by the total number of conversation turns. Twenty adult established hearing aid users were assessed for fluent conversation, both aided and unaided. Recorded conversation samples, without the benefit of visual cues, were scored and analyzed with a dependent t-test. An audibility index for each participant was calculated using the count-the-dot audiogram method.

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## **STREAMLINING YOUR REHEARSALS WITH CONDUCTING-GESTURE INSTRUCTION**

When we teach band, many of us have our techniques and tricks that work effectively with our students. If you have had experiences with professional performing groups, you know that there are gestures that the conductor shows that are automatically understood. Responses to these gestures are learned, almost in a Pavlovian manner. Over the years we begin understanding these gestures and begin responding to them as we see with many professional groups. By approaching rehearsals with Pavlovian methods, we can take the idea of conducting-gesture instruction and begin streamlining our rehearsals with it. With proper conditioning, your baton can say something in a second that it may take several minutes to verbally explain.

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## **OPTICAL PRESSURES AND ENERGIES FROM RELATIVISTIC ELECTRODYNAMICS**

The momentum of light in media, or Abraham-Minkowski debate, is a highly controversial and unresolved topic that demonstrates the forces utilized in the optical manipulation of matter. Within the past decade, the debate has had a renewed interest due to modern applications dealing with the inherit forces that light imposes on materials. These applications span throughout the varying fields of science and nanotechnology, all with the purpose of moving or manipulating macroscopic materials with light. By using energy relations from Doppler-shifted light, along with two formulations of electrodynamics and mathematical techniques, the researchers derive the two debated momenta and demonstrate relations between the optical forces. This research has recently been published in "Physical Review A."

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## **NUMERICAL APPROACHES TO THERMOELASTIC RODS WITH DYNAMIC CONTACT**

We study numerical schemes for solving a system of PDEs that describe the displacement and temperature of a thermoelastic rod. When the rod touches a deformable obstacle, the normal compliance is considered as a contact condition. We set up numerical formulations using time discretization and a hybrid of the midpoint rule and the implicit Euler method. The boundedness of the energy function over each time step ensures numerical stability. The Finite Element Method sets up the fully discrete numerical formulation. Numerical results and simulations are presented. The case is also considered for a nearly perfectly elastic rod without thermal conditions. The model is tested with a non-homogeneous initial temperature distribution, which is shown to behave similarly to the homogeneous case.

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## **RECONSTRUCTION IN ARKANSAS**

After the Civil War ended, most Southern states entered a period known as Reconstruction. Reconstruction was how the Union would allow the Southern states to re-enter the Union. Reconstruction went smoother in some states than in others and freedmen had differing experiences. In the state of Arkansas, freedmen had better experiences than in most states, and in some cases, freedmen were persuaded to go to Arkansas by the Freedman's Bureau. While Arkansas offered more opportunities for freedmen after the war, everything was not perfect. Arkansas had lots of swampland where many diseases spread and at the end of Reconstruction, Arkansas became one of the worst states to live in.

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## **COACHING PRESSURE CAUSES UNETHICAL DECISION MAKING**

Coaching is a very respected profession. However, over the years, society has developed a strong social construct of winning. At times the desire to win will cause some coaches to coach unethically. Winning creates job security for coaches; in addition to giving them the opportunity for better future positions. When coaches act unethically is there a realization of these acts prior to its occurrence or is it done unconsciously? In order to ascertain more about the thought process of coaches who coach ethically or unethically, we will examine collegiate coaches where the turnover rate is fairly moderate. This study will use personal interviews to understand how a coach and his or her thought process is steady or corrupted due to the pressure to win.

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## **RED IMPORTED FIRE ANT: THE GLOBAL ENVIRONMENTAL AND ECONOMIC IMPACTS OF THE INVASIVE SPECIES ON WILDLIFE, AGRICULTURE AND PEOPLE**

The red imported fire ant (RIFA) is native to South America, but is an invasive species in the southern United States and many other countries. This species of ant is more aggressive than native ant species. They create large mounds as nests, and when humans or animals inadvertently step on these mounds, the ants swarm and attack. Their mound building can damage plant roots, lead to loss of crops, and damage mechanical devices. They can virtually clear an area of other insects, ground-dwelling birds, and lizards. RIFA cost the United States billions of dollars a year in damage to agricultural crops and equipment. In response to the growing RIFA invasion, affected countries have used pesticides, biological methods and physical methods to fight the problem, somewhat ineffectively.

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## **BRANDING: THE EFFECT OF USING PROFESSIONAL ATHLETES IN ADVERTISING**

Celebrity athletes have a major influence on the clothing brands people choose to wear. According to the Journal of Advertising Research, 14% to 19% of advertisements that aired in the U.S. in recent years featured celebrities that endorsed products and brands, but did these companies have a positive return in money from their investment with these athletes? The purpose of this study is to determine if major athletic brands have a positive return rate from the money they invest in athlete advertising and endorsements.

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## **MARKETING TO GENDERS: A STUDY INTO THE DIFFERENCES BETWEEN MALE AND FEMALE REACTIONS TO VIOLENCE AND SEXUALITY ON TELEVISION COMMERCIALS**

Violent and sexual content can be found in advertisements even when the product being marketed has no genuine ties to either violence or sexuality. Marketing corporations need to know the reactions of their intended audience in order to organize maximally successful advertising campaigns. The current study would conduct a controlled research experiment determining the psychological effects and marketing efficiency of violent and sexual content in television commercials on a specified sample of the target population. Differences in gender perception of violent and sexual content in advertising will also be recorded in the study. The current method of research will also allow for controlled and measurable exposure to violent and sexual content in television commercial advertising.

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## **STEREOTYPES OF ADOLESCENTS**

Are adolescents as bad as society proclaims? Stereotypes about adolescents abound, most of which are negative, but research on adolescents is mixed. For example, although some research suggests that adolescents may be narcissistic, other research shows that adolescents of today are much less violent than before. Where do stereotypes come from if they do not match adolescent behavior? Our research examines adults' stereotypes by contrasting beliefs about adolescents they know personally with adolescents in general. If stereotypes are based on experiences, there should be a correspondence between known and unknown adolescents. If not, it suggests that beliefs about adolescents are based on other factors, such as media reports.

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## **TEACHERS WHO WRITE AND THEIR INFLUENCE ON STUDENT WRITINGS: THEORETICAL SUPPORT AND OBSERVATIONS**

Historical theoretical perspectives hold that teachers of writing who share their own reflexive and extensive writings with students help students become more successful writers. For an honors project, I juxtaposed my understanding of the literature on this philosophy of teaching writing with my observations of one teacher who uses this writing process in her fifth grade classes. She inspired the students' writing development by drafting, revising and presenting her own work and processes. Her students held open discussions to critique peer works in a positive environment that included writing groups and conferencing. The outcome of my observations as a teacher candidate cemented this strategy as one that develops passionate writers.

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## **LIGHTNING TALK: CREATING A PERFORMER'S ANALYSIS OF A POST-TONAL WORK OF PAUL HINDEMITH**

When studying music, a performer's analysis can be a useful tool to examine theoretical constructs of a piece. In Western music, standard methods of analyzing elements of music (including melody, harmony, rhythm and form) are employed effectively without drastic variation. However, the study of some twentieth century composers requires adjustments to methods to better understand how post-tonal techniques affect musical structure. Adjustments required for this genre include an examination of melodic and harmonic elements according to the Series I and II constructions, very common among Hindemith's works. Although rhythmic and formal analyses are close to standard methods, a post-tonal analysis does affect diagnosis of performance issues and colors how performers should approach the piece.

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## **THE STRUGGLE BETWEEN ATHLETIC ACHIEVEMENT AND NCAA JUSTICE**

In 1984, the Supreme Court passed a bill that enhanced the commercialization of collegiate athletics allowing universities to negotiate their own television contracts for athletics. NCAA also has a bylaw that confines all of its athletes to amateur status meaning there can be no reward or grant-in-aid for athletes. The controversy is related to athlete performance that helps several NCAA universities generate millions of dollars each year. The purpose of this review is to explore the financial benefits for the NCAA as a result of minimizing allocation of financial benefits to the athletes. As Schwarz stated, could this be the greatest injustice in sport or is this merely preserving the character and quality of the product (athletes)?

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### **ANALYSIS OF STALKING AMONGST ADOLESCENTS**

Stalking is one of the most ambiguous crimes that can be committed because in order for authorities to classify it as a crime the victim must feel threatened for their life; the level of threat a victim feels varies upon the individual. Most of the current research has focused on adults' perspectives of stalking behaviors and their experiences, but has not focused on adolescents' perspectives. Our research focuses on both perspectives in an effort to compare developmental differences between the two groups.

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### **THE SELFIE GENERATION: HOW DOVE'S "REAL BEAUTY" CAMPAIGN BROUGHT A WHOLE NEW MEANING TO SELF-IMAGE**

This study examines how Dove's "Real Beauty" campaign directs women to view themselves in an era where social media contributes to the self-deprivation and devaluation of females based solely on appearances. By incorporating the growth of social media into the self-evaluation of females, survey method is used to look at how social media could affect women's self-body image. Research on the "Real Beauty" campaign could demonstrate the progression of the campaign over the past decade and how it may contribute to the growth of women's self-esteem and comparisons.

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### **CHRONIC ORAL NICOTINE INTAKE IMPACTS NICOTINE METABOLISM BUT NOT THE CIRCULATING ESTRADIOL LEVELS IN FEMALE RATS**

We investigated the effect of chronic oral nicotine intake on nicotine metabolism and serum estradiol in female rats. In two studies, rats (n=24, and n=8) received nicotine (30 µg/ml) and water, or water only. Sera and urine samples were collected at 1, 7, or 14 days of nicotine intake and analyzed for the nicotine metabolite cotinine, and estradiol. Cotinine was found in sera and urine following 1 day of nicotine intake; however concentrations decreased to negligible levels after 7 and 14 days. Estradiol levels did not differ between nicotine treated and control rats. Oral nicotine administered at the given concentration and duration may not alter estradiol, the initial presence yet later absence of nicotine's primary metabolite may suggest an alteration in nicotine's metabolic pathway.

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## **EFFECT OF TEMPERATURE AND RICE FRACTION ON RED FLOUR BEETLE (*TRIBOLIUM CASTANEUM*) DEVELOPMENT**

The Red Flour Beetle (*Tribolium castaneum*) is a globally distributed secondary pest of stored products and grains. However, no research has been done to observe how these beetles live on rice. Rice is a multi-billion dollar industry with Arkansas being the leader in rice production. Rice mills and on-farm storage of rice are potentially excellent environments for the Red Flour Beetle to thrive in. In order to examine how these beetles develop on rice, Red Flour Beetles were reared on different rice fractions as well as at different temperatures. Red Flour Beetles were found to not only mature to adulthood faster but also grow larger on rice bran. In addition, the beetles maturity rate to adulthood was greatly influenced by temperature with the fastest being 32 degrees Celsius at <30 days.

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## **PATRICK GILMORE: IMMIGRANT, MUSICIAN AND PURVEYOR OF AMERICAN CULTURE AND TRADITIONS**

Irish immigrant Patrick Gilmore was a sensational personality whose dedication to his craft and the people around him allowed him to advance his career, music in America and the American culture. Gilmore was named “father of the American band” by musician and bandleader John Phillip Sousa. His tireless work to promote and evolve the wind band into a position of cultural prominence for America has had long-lasting effects on millions of students since his time. Adding woodwinds to the brass band, his awareness of contemporary European music, attention to quality and ability to entertain, enrich and rouse optimism in his audiences paved the way for him to positively affect the music and culture of America.

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## **ENGINEERING THE PRESIDENCY: THE TECHNOLOGY OF PRESIDENTS AS METAPHOR FOR THEIR ADMINISTRATION**

By examining the historical background of each president’s use of a particular technology, as well as presidential communication, party platforms and other historical sources to show how the tool signifies the worldview, political purpose or executive activity of each president, an iconography of each presidential administration emerges around an emblematic tool.

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### **READING NEVER LET ME GO THROUGH THE LENS OF JUDITH BUTLER**

Judith Butler's views on gender, expressed in her text "Gender Trouble," have molded the politics of gender theory. While Butler's theories have largely impacted society, they have been heavily criticized with the exception of her theory of heteronormativity. This theory is characterized by the belief that heterosexuality is superior to other sexual orientations, and the assumption that heterosexuality is an individual's default sexual orientation. Butler's theory of compulsory heterosexuality is uniquely challenged by the implication of cloning found in Kazuo Ishiguro's novel, "Never Let Me Go," as the clones present in the novel deal with being oppressed by the dominant group of "normals" while also creating a new possibility for reproduction that is not available for heterosexuals.

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### **COLLEGE ATHLETES RIGHTS OF PUBLICITY: FINDING THE PERCEPTION OF ATHLETES ABOUT THEIR RIGHT TO USE SOCIAL MEDIA**

Currently some collegiate athletes are restricted in their use of social media and right to publicity. The purpose of this study is to determine the benefits of limiting college athlete's use of social media and right to benefit from publicity gained through athletic performance. The First Amendment of the United States Constitution protects an individual's freedom of expression. Coaches have previously announced that they ban the use of social media to keep players focused during their season of play. Research is needed to determine an athlete's perception of the change of their performance and comfort due to the prohibition of social media. The findings of this study could help coaches better relate to their athletes and maximize their potential during the time they are on campus.

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### **THE COST OF DEVELOPMENT: BRAND EQUITY AND THE IMPACT OF A-STATE FOOTBALL CORPORATE SPONSORSHIPS**

Corporate sponsorships have become a valuable source of revenue that athletic departments use to fund their programs. Corporate entities are currently aligning with the Arkansas State University football team to enhance their brand image. Research shows that corporate support of athletic programs increases sales and awareness (Covell 2001). Corporate sponsors of the Arkansas State University football program would value information on the perceptions of their brands by Red Wolves fans during their return-on-investment financial review. Data is also needed to find the purchase intentions of fans due to the corporate sponsorships affiliated with Arkansas State Red Wolves Football. This research data could potentially lead to more sponsorship agreements with local and national brands.

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## **CAN WEATHER HAVE AN INFLUENCE ON MOOD?**

Weather has been known to play a role in the type of mood people are in. Several studies have been done to analyze the relationship between the variables of weather and mood in several aspects and scenarios such as friendliness, social desire, and having particular behaviors in certain weather conditions. The purpose of this study is to see if weather can have an influence on an individual's mood on a daily basis. The method of study will be a qualitative study with a survey and some structured open-ended questions. The sample will be students at Arkansas State University and they will be a convenience sample. The expectations of the results of the study is to see if the weather can have any effect on a person's mood on a daily basis and how much of an effect.

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## **THE REAL TROUBLE WITH A HOUSING BUBBLE**

The financial crisis of 2008 is categorized as one of the most severe financial devastations since the Great Depression. The crisis impacted every aspect of the global economy and resulted in key alterations to fiscal and monetary policies. The crisis was fundamentally triggered by the bursting of the housing bubble and the subsequent decline in the value of securities tied to U.S. real estate. Fueled by subprime lending, high loan-to-value ratios and faulty credit ratings, the housing bubble continued to expand until it ultimately exploded. This study will examine the factors that could indicate the presence of a housing bubble. Then, analyze evidence to the question: Is there a difference between real changes in housing values and the presence of a growing housing bubble?

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## **ELECTRONICS OF A CONDENSED SOLAR RADIATION TROUGH**

The electronics portion of our group's solar trough project includes multiple motors with different functions controlled by a preprogrammed Arduino. The solar trough will have photo resistors to detect the position of the sun which will be read by the Arduino that stores the data and uses it to perform functions to align the trough so that the focal line receives the most solar radiation at all times during the day. The Arduino will continuously collect data, such as the temperature of the concentrated sun light, which will be plotted on a heat-versus-time graph which will allow us to know when to expect any given temperature during the day. Data of the positioning of the trough will also be stored. All the analyzed data will act as the tests against the group's hypotheses.

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### **CONSTRUCTION OF AN OPTICAL PARAMETRIC OSCILLATOR**

I assembled a seeded optical parametric oscillator using a diode laser and potassium titanyl phosphate (KTP) crystals. The system requires the laser to pass through one mirror and the crystals before being trapped between two parallel mirrors. To achieve constructive interference within the cavity, a computer program adjusts the position of a cavity mirror depending on the readings observed from a fast photo diode. The seed light is amplified by a factor of one million by pumping the KTP crystals with the second harmonic of a Nd:YAG laser. Once generation is achieved, the Nd:YAG laser can be reduced to prevent generation without the diode seed, ensuring single longitudinal mode operation.

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### **COST-EFFICIENT DIY SOLAR TROUGH**

Our team's project for Physics Instrumentation consists of the mechanical design of a parabolic solar trough that concentrates sunlight and automatically tracks the sun for maximum efficiency. The idea behind this solar trough is not only energy efficiency, but cost efficiency, as well. The components will primarily come from DIY stores and 3-D printing. The energy collected from the sun by the trough will be used for various things such as melting metal, boiling water or running a steam engine. The trough will consist of two parabolic panels that have one single rod fixed at the focal point of both troughs, which will track the sun based on data collected from a solar cell located on the trough itself. We hope that this project will inspire others to design and make their own troughs.

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### **WATER QUALITY IMPAIRMENTS OF THE CACHE RIVER, ARKANSAS: WHO'S TO BLAME**

The Cache River, Arkansas is a 303(d) impaired waterway due to turbidity, total dissolved solids and lead (Pb) contamination. The cause of this impairment is thought to be agricultural, but no comprehensive study has been carried out to validate this hypothesis. We are examining 19 headwater watersheds of the Cache River, as well as four sites within the main channel of the Cache to determine both how water quality parameters differ between sites and how land usage impacts these parameters. Parameters examined include turbidity, total suspended solids (TSS), dissolved nutrients (NO<sub>2</sub>, NO<sub>3</sub>, PO<sub>4</sub>), total nitrogen and total phosphorus. Here we present preliminary data and conclusions obtained from monthly sampling (Aug 2013-Mar 2014).

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## **DOES ENERGY CONSUMPTION REALLY HELP RUNNERS?**

Runners are no strangers to using gels to help them finish, but there has been no research that proves it actually helps. The purpose of this study is to determine whether energy affects men or women greater while running long distance. This study is to show how consuming energy while running can affect your overall performance. There will be two parts to this research. First, there will be a survey handed out to runners to get their opinion on energy consumption while running. Second, there will be a case study with one male and one female. They will be tested once with energy consumption and once without energy consumption. Then they will compare the results. Researchers hope to prove that energy consumption is effective in the runners' overall performance.

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## **A SERVICE-LEARNING APPROACH TO STUDENT-FOCUSED MOTIVATIONAL INTERVIEWING**

Recent studies show that Motivational Interviewing (MI), an efficient and effective client-centered intervention strategy that intrinsically motivates people to change problematic behavior, has the potential to improve the academic performance of middle school students. In 2012, Strait et al. demonstrated that MI can be used to improve academic behavior/performance using graduate students to administer a single semi-structured Motivational Interview. The purpose of this study is to replicate these findings in a new location with different service providers. We hypothesize that undergraduates can implement the treatment protocol with fidelity and that middle school students receiving a single MI session will demonstrate significant improvement in overall academic behavior and performance.

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## **CONTINUOUS EVERYWHERE BUT DIFFERENTIABLE NOWHERE FUNCTIONS**

In this talk, we consider a classical problem in real analysis: the construction of continuous but differentiable nowhere functions. This problem has a long history in mathematics, starting with Weierstrass's first example in 1872. We use an approach developed by Kiesswetter in 1966 and find the generalized Kiesswetter's functions. We establish a criterion for such generalizations and show how such functions can be understood geometrically.

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### **THEORETICAL MODELING FOR DYNAMIC BEHAVIOR IN VANADIUM REDOX FLOW BATTERY**

In order to implement alternative energy effectively, there must exist a technology to increase reliability, and the Vanadium Redox Flow Battery (VRFB) may be one of the solutions. The VRFB can be used for energy storage, peak leveling, and output power stabilization, hence greater energy efficiency. The VRFB project at Arkansas State focuses on pinpointing the transient characteristics of the vanadium redox flow battery in terms of chemical reaction, fluid flow and electric circuit by obtaining exact solutions from the associated governing differential equations using a numerical approach. We aim to better understand the transient characteristics of the VRFB in hopes of improving efficiency. This presentation will focus on the steps taken to validate the supporting mathematical models.

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### **FATE IN JOHN MILTON'S *PARADISE LOST***

John Milton's *Paradise Lost* depicts not only the cosmic spaces within the known universe, but also concrete places outside of what Milton is able to define or identify. This space, the unexplainable abyss, and its planets and moons are concrete places identified as belonging to a character. In order to continue the running theme of hierarchical organizations throughout *Paradise Lost*, Milton must issue a commander for this plain. He does so with Fate, a deity all its own just as God and Satan are commanders in their worlds. This theory opens up the idea of choice outside of God's world and presents a universe in which God's universe itself is a choice. Fate's presence is the driving force felt throughout *Paradise Lost* and issues a reexamination of Satan and God's roles and choices.

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### **APPLYING EXTERIOR MATRIX METHOD TO AN INCLINED CABLE PROBLEM**

The Exterior Matrix Method will be introduced and applied to an inclined cable problem with a point mass. This method utilizes a general result for when the governing equations is a system of four first-order equations. Interestingly, the governing equations do not have to be solved in order to find the corresponding exterior matrix, and the exterior matrices can be multiplied together to find the eigenfrequencies of the system. We will then compare how the frequencies change depending on the position of the mass.

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## **MOTION OF A NON-LINEAR SPRING WITH DYNAMICAL CONTACT**

A non-linear damageable spring is attached to a wall. At the end of the spring, a mass is attached which may come into contact with a rigid obstacle. We will consider a lubricated surface, causing friction to be negligible. The mass will oscillate nonlinearly until the mass and the rigid obstacle create a contact force, which will alter the mass's equation of motion. First, a linear spring is considered under these conditions, using mathematical theories and numerical methods. Then, a numerical algorithm will be created to determine the motion of the nonlinear spring.

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## **HOT QUARK-GLUON PLASMA AND ITS WORK DURING EXPANSION**

Quark Gluon Plasma (QGP) is formed when heavy ions collide at relativistic speeds. Moments after the collision, the gluons are freed due to deconfinement. At this time, each gluon will have some momentum and transverse energy, and the extreme relativistic gas will do work during the expansion. Using the particle transverse momentum distribution, one can extract the fundamental temperature of the QGP. One will also find that the event work and event transverse energy distributions follow a gamma distribution. Upon further study, one can see that the initial particle and thermal conditions determine the shape of the distributions.

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## **ASIAN CARP IN THE MISSISSIPPI: THREATENING OUR GREAT LAKES ECOSYSTEM**

"Invasive Alien Species" is one of five broad categories of damaging behaviors that I refer to as the 'five deadly sins of our earth.' Asian Carp in the Mississippi River is one example. In this paper are findings of my research. How do we control the carp from entering our Great Lakes region and to what cost will it have on our waterways? America's Great Lakes region has been the habitat chosen by many non-native species. The main reason for this implementation is to achieve higher productivity through acclimatization of the new species. Ecological separation is being considered as the primary long-term solution, while raising another complex set of issues that have underlying effects on economic, environmental and political realities.

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## WHEN DO UNETHICAL DECISIONS COST ATHLETES ENDORSEMENTS?

Celebrity athletes can influence the global community and impact more than just the game they play, making them an important part of the marketing ecosystem. However, controversy arising from unethical decisions made by an athlete can force sponsors to rethink their partnerships. There are certain decisions made by athletes that force sponsors to re-evaluate their company's core values and the impact those values have on society as a whole. Celebrity athletes have a broader societal implication that raises important ethical questions about firms that use these athletes to endorse branded products. The goal of this study is to determine which specific unethical decisions made by athletes are considered more detrimental to a firm's ethical reputation.

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## TO FREE OR NOT TO FREE: CRIME CONTROL VS. DUE PROCESS ORIENTATION

Within the criminal justice system two competing goals exist, Crime Control vs. Due Process Orientation (CCDPO). Crime Control focuses on capturing and punishing criminals at the cost of individual civil rights. Due Process focuses on protecting the rights of the individual. Jurors' previous world views and individual opinions toward Crime Control and Due Process can substantially influence the verdict of the trial. The goal of the current research is to create a scale designed to examine individual jury member's CCDPOs. To accomplish this, participants will be presented with 60 questions related to CCDPO and participants' responses will be factor-analyzed to create the new scale. This scale will then be utilized to examine the effects of CCDPO on various aspects of jury decision making.

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## ARKANSAS STATE UNIVERSITY HIPPO THERAPY CENTER: A CREATIVE ACTIVITY

Hippotherapy, as used in physical therapy, is a treatment strategy that utilizes traditional therapy along with equine movement as part of an integrative program to gain improved functional outcomes. The multidimensional movement of the horse provides a smooth receptacle and alternating movements. The saddle turns into a dynamic base of support. Goals for therapy are included but not limited to: trunk strength and control, balance, postural endurance, weight bearing limitations, and motor planning. Equine movement provides sensory input to vestibular, proprioceptive, tactile and visual areas.

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## **THE DRYING OF THE ARAL SEA**

While in the ancient times water bodies' changes were natural, with the turn of the twentieth century and growing engineering technologies, humans learned how to alter the flow of water at their discretion without considering the consequences. The Aral Sea, the cornerstone of the steppes of Central Asia, has been a sad example of how neglect and unsustainable practices can deteriorate a once massive lake. Up to the 1960s, the Aral Sea was number four among the largest terminal lakes on the planet with an area of 68,000 square kilometers. By 2009, the Aral Sea had shrunk to 10 percent of its original size. As of today, the ongoing issue of the Aral Sea remains one of the most important concerns for the people of Central Asia and serves as a great instance of a human-made ecological disaster.

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## **SIMILARITIES AND DIFFERENCES BETWEEN INTERNATIONAL AND LOCAL STUDENTS: AN INVESTIGATION OF VALUE, TRUST, COMMITMENT, QUALITY AND LOYALTY**

Several studies show that creating long-lasting relationships with students and student loyalty are important topics in higher education institutions (HEIs). For instance, Shah (2009) shows that HEIs have been seeking to improve their services so as to increase students' perception of their HEI quality and to improve satisfaction and revenue (Marcelo et al., 2012). This study focuses on students attending Arkansas State University in Jonesboro and their perceptions of value, trust, commitment, quality and loyalty and how these variables relate in the context of Arkansas State. Findings from comparing variables in two student groups (students from United States and international students) will have implications in terms of recruitment, retention, and improvements that can be made to improve the college student experience at Arkansas State.

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## **AN EXAMINATION OF SOCIAL MEDIA FOR NEWS INFORMATION OVER TV AND INTERNET WEBSITES AMONG COLLEGE STUDENTS**

This study attempts to examine the effects that social media has on college students who view news information. The current study will explore the links between where college students are viewing news information and their intended exposure to information. This could be through entertainment news, business news, international and national news, sports news and political news. Because of social media's growing popularity among young people, we believe that college students have a wide array of uses and outlets to gather news information that has typically been used for traditional forms of media. This allows for media organizations to build trust among its followers and use social media as an outlet to reach college students and give them the news information they would want to receive.

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## **DOES WARMING UP PREVENT INJURIES FOR WEIGHTLIFTERS?**

It has been reported that warming-up has a limited effect on injury prevention, but counter-arguments suggest otherwise. Warm-ups can vary in three different categories: stretching, cardio, and light intensity set (Young & Behm, 2002). The purpose of this study is to determine if warming-up the body before lifting will have any effects on weightlifting injuries. A random sample will be used on the participants that strength train through quantitative research. Should static stretching be eliminated from warm-up before strength and power activities? Overall, it should overall increase their flexibility and stabilizing muscles, and prove that the key is how the weight is lifted.

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## **PAYING COLLEGE ATHLETES**

The notion of paying college athletes has been an ongoing debate since the early 1900s. With all of the revenue that a school brings in from their athletic programs, it has been considered to compensate the athletes more than just the athletic scholarship that they have already been awarded. Our research makes a point/counterpoint approach to how this might have possible negative consequences for college administrators, athletes, and coaches. The two sides of our research topic are passionate beliefs in the fact that paying college athletes would destroy college sports as we know them, while the other end of the spectrum hosts those that would argue the status quo is unfair and unattainable to some.

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## **SOURCES OF COLLEGIATE ATHLETIC FACILITY FUNDING**

State-of-the-art athletic facilities are becoming crucial to the success of an athletic department. However, it is increasingly difficult to finance these projects. Many athletic departments rely heavily on cash gifts, increasing tuition and fees, loans, bonds, and increasing ticket sales in their revenue-generating sports. According to Libby and Wolverson (2009), athletic department debt payments have increased from about \$400,000 a year in 2006 to an estimated \$3.7-million in 2009. Our research will examine how the success of an athletic department on the field improves its financial situation. We will conduct a review of public records to evaluate the financial standing of programs with different success rates on the field and to determine how these programs fund their renovations.

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## **COMPARING WATER QUALITY OF AGRICULTURAL AND NON-AGRICULTURAL STREAMS**

The Cache River, Arkansas is a 303(d) impaired waterway due to turbidity, total dissolved solids and lead (Pb) contamination, thought to result from agricultural land usage. We compared water quality of streams in agricultural and non-agricultural areas of a sub-watershed of the Cache River. Physical and chemical characteristics were measured at each site. Acute toxicity tests (48-h) were performed according to standard EPA methods with water collected from each site, using synthetic, moderately-hard water as a control. Channelized sites differed significantly in most physical and chemical parameters measured. No difference was measured in acute toxicity tests between sites. Our results indicate agricultural land usage is likely to result in impaired water quality.

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## **ALTERNATIVE SOLUTIONS TO THE FUNDING CRISIS IN HIGH SCHOOL ATHLETICS**

Budgets for extracurricular activities in public schools in the U.S. are diminishing, forcing school administrators to decrease spending. Extracurricular school activities are often the first expenses to be eliminated (Hoff & Mitchell, 2006). Because high school athletics are moving toward a pay-to-play system, the burden of paying fees to participate usually rests with the parents. Fundraising, corporate sponsorships, naming rights, merchandising and broadcasting rights for games that are televised are all potential alternative sources of funding. This study will examine these viable alternative funding sources that will help alleviate the increasing costs of high school athletics.

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## **TOMMY JOHN SURGERY: SAME PROCEDURE, DIFFERENT RESULTS**

The ulnar collateral ligament (UCL) is crucial when using the overhand throwing motion in athletics, particularly baseball. The UCL can be damaged over time in pitchers who constantly use the overhand throwing motion while pitching. Tommy John surgery was an experimental surgery completed by Dr. Frank Jobe on the famous pitcher, Tommy John, as an effort to save John's career. The surgery today has been monumental in resurrecting the careers of several athletes. My study will be an interview process with 3 different athletes who have had the Tommy John surgical procedure completed and use a compare and contrast method to determine if certain rehabilitation processes led to having faster recovery times in these athletes.

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## **OPENING OUR DOORS: USING WRITING CENTER TUTOR-FACILITATED WRITING GROUPS FOR SITES OF STRATEGIC COLLABORATION**

University faculty, administration and students want widespread writing initiatives, but seldom provide resources. Further, many of our colleagues and peers see the Writing Centers as only serving undergraduate students, specifically, those with “remedial” needs. WC tutor-facilitated multidisciplinary writing groups, however, can assist in debunking these misconceptions, while also providing students and colleagues with supportive writing communities and tutors with leadership experience. Such considerations will include the role and training of the tutor-facilitators, how to set ground-rules for appropriate group discourse, and how to foster an atmosphere conducive to limiting power dynamics.

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## **AN ANALYSIS OF SUSAN BORDO'S *UNBEARABLE WEIGHT***

In *Unbearable Weight*, gender theorist Susan Bordo argues that society makes rules about femininity in order to keep women in an oppressive state. According to Bordo, women learn the rules of society from forms of media such as advertisements, books, and films. Ultimately, Bordo believes gender is a socially constructed, culturally driven construct which is written upon the body. Through the disorders hysteria, agoraphobia and anorexia, the female body is used as a means to control women while also being a form of protest for the victimized.

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## **THE EFFECTS OF WEEKLY MINDFULNESS SESSIONS: A CASE STUDY**

The objective of this research endeavor is to investigate the effects of weekly mindfulness sessions on an individual's daily life and psychological well-being. In previous research, mindfulness techniques have demonstrated an improvement in physical health and psychological well-being.

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## **THE GROUNDINGS**

My novel *The Groundlings* draws inspiration from a menagerie of novels in the dystopian canon. The title has a Shakespearean derivative. A groundling was a person who frequented the Globe Theatre in 17th century England and was too poor to pay to be able to sit. By paying one penny, they were permitted to stand in the pit just below the stage to watch the play. Societal issues such as government control, the overemphasis of technology and its effect of dehumanization, the brutality of humanity when Man loses compassion and allows war to infiltrate society, and the damaging effects humans can inflict on the environment are all touched upon. These themes are crucial in understanding dystopian literature as a whole.

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## **INJURIES SUSTAINED IN BOXING VS. MIXED MARTIAL ARTS**

The question has been posed of whether boxing or mixed martial arts (MMA) is safer. The American Association of Neurological Surgeons says that by the end of their careers, 90% of boxers and MMA fighters will have sustained a traumatic injury. 25% of injuries sustained in boxing are severe enough to impact occupational functions, as opposed to 23.6% in MMA. We plan to use both qualitative interviews and literature reviews to gain information. Our sample will be anyone who trains for MMA and boxing, along with their trainers and physicians. Accompanied by previously reported statistics, our study will contribute additional information regarding the effects on the body of participation in boxing and MMA, and will encourage people to take better safety precautions when they participate.

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## **COMPARISON OF FIELD METHODS FOR ESTIMATING FRUIT RETENTION FOR INSECT PEST CONTROL DECISIONS IN COTTO**

Current State Extension recommendations for managing the cotton insect pest, *Lygus lineolaris*, suggest monitoring the crop to measure shed of floral buds (squares) lost due to insect feeding. The Extension guide suggests inspecting only the uppermost 3 fruiting positions of the plant. My hypothesis was that this method could underestimate the condition of a cotton producer's crop resulting in a greater risk for economic damage. I analyzed field data from a small plot research trial to compare how control decisions would vary if the sampling regime included the top 3 sites compared to a whole plant sample. Results from this analysis indicate that the whole plant sample provides a better estimate of pest activity and would be more appropriate for use in pest management decision-making.

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## **COMPARISON OF WRITTEN MEDICAL INFORMATION PROVIDED BY MEDICAL CLINICS AND PHARMACIES IN TWO COUNTIES IN NORTHEAST ARKANSAS**

Medication nonadherence in the United States contributes to early death and poor quality of life (Alspach, 2011). This problem is especially critical in the older adult population. Shorter hospital stays and increased home management of illness have led to decreased teaching/learning opportunities and an increased dependence on written materials to provide health maintenance and medication information. Therefore, written information is crucial for older adults to prevent hospitalization, maintain an optimal level of health, and to improve their quality of life. This study explores and describes the readability of medical information provided to patients aged 65 and older by medical clinics and pharmacies in two counties in Northeast Arkansas.

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## **DO RELIGIOUS GROUPS HAVE THE RIGHT TO USE PUBLIC SCHOOL FACILITIES?**

This paper begins from a personal experience and then researches the legal history of the use of public school facilities by religious groups.

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## **OPPRESSION OF THE FEMALE IN *THE TENANT OF WILDFELL HALL***

*The Tenant of Wildfell Hall* by Anne Brontë was published in 1848. Focusing on a woman who has run away with her child, the novel tells a story of Helen Graham leaving her abusive husband and moving, where she supports herself by selling her paintings. The novel, controversially so, addresses women's rights as wives and mothers, the horrors of alcoholism, women supporting themselves, and finally the notion of raising children the same way, no matter their gender. My area of research looks at the three controversial issues, which are women's rights, child rearing and the notion of women supporting themselves. Anne Brontë addresses all three of these in great depth in *The Tenant of Wildfell Hall*.

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## **PRODUCTION AND CHARACTERIZATION OF PELLETS MADE FROM ARKANSAS CROP RESIDUES**

Crop residue is usually deemed as a waste although having huge potential for producing value-added products such as solid biofuel pellets. In the present study, pellets were produced by the process commonly known as pelletization, using binders. These densified pellets were then characterized to explore their properties such as bulk density, durability, fines and heating values. Proximate Analysis were performed. The agri-pellet properties were compared with the Pellet Fuel Institute standard for residential/commercial densified fuel wood pellets. Measurements show that these pellets have properties similar to the utility grade wood pellets with slight deviations. Further analysis will be done using Taguchi Method 4-factor Analysis (L27 Orthogonal array) and emission tests.

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## **THE LIFE OF A WIND FARM**

First off, what is a wind farm? A wind farm is an area of land with a group of wind turbines that produce electricity for surrounding areas. Wind farms can have hundreds of turbines on location. If you live near or drive by one, then you know these farms do not appear overnight. What most people do not realize is that wind farms have life cycles, just like everything else on Earth does. Typically there are five stages in the life cycle of a wind farm: (1) site assessment, (2) development, (3) construction, (4) operation, and (5) decommissioning and restoration. Each of these stages has steps that have to be followed before the lifecycle moves onto the next stage. There are also several different ways to complete each stage.

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## **BIOSYNTHESIS AND PURIFICATION OF ARACHIDIN-1 FROM HAIRY ROOT CULTURES OF PEANUT**

Stilbenoids are polyphenolic compounds found in plants, like peanuts and grapes, which have a wide range of biological effects. Among the peanut stilbenoids is arachidin-1, which has shown cytotoxicity in different cancer cell lines and higher metabolic stability than other stilbenoids. To produce arachidin-1, peanut hairy root cultures were treated with a combination of elicitors and a putative metabolic precursor. Next, stilbenoids were extracted from the culture medium and analyzed by HPLC. To purify arachidin-1, extracts were pooled and separated by HPLC. Fractions corresponding to arachidin-1 were analyzed by HPLC to assess purity. Our work demonstrates the utility of the hairy root culture system to produce bioactive compounds with applications in human health.

*Faculty Mentor: Fabricio Medina-Bolivar, Biological Sciences, fmedinabolivar@AState.edu*



**Vogt, Sarah** – Environmental Sciences, Graduate

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## **MONITORING OF WATER QUALITY TO DETERMINE EFFECTIVENESS OF THE BEST MANAGEMENT PRACTICES (BMPS) FOR THE LARKIN CREEK WATERSHED**

The Larkin Creek watershed, a 55,886.76 hectare subwatershed of the L'Anquille River, is listed as a 305(b) impaired waterway. The impairment of the stream is due to sedimentation and fecal coliforms from possible agricultural activities. In 2011, several Best Management Practices (BMPs) were initiated to a sediment pond, riparian buffers, sediment removal and channel restoration. Three sampling locations were chosen based upon prior sampling before the BMPs. Water quality monitoring included on-site testing of pH, dissolved oxygen, temperature, and conductivity. Water samples were taken once a week from the three sites and tested for total suspended solids (TSS), turbidity and dissolved nutrients at the Arkansas State University Ecotoxicology Research Facility.

*Faculty Mentor: Jennifer Bouldin, Biological Sciences, jbouldin@AState.edu*

**Watkins, Kayla** – Physics, Undergraduate

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## **DIFFERENTIAL PUMP SYSTEM**

I constructed a differentially pumped vacuum system. The system consists of two chambers separated by a skimmer (with a 0.51 mm opening). A pulsed valve driver, which can open and close in duration of 300 microseconds, injects a gas into the first vacuum chamber towards the skimmer. A small fraction of the molecules pass through the skimmer into the second chamber. Included on the second chamber is a set of three windows for optical measurements. Each chamber is pumped by a diffusion pump. In each chamber the pressure is monitored by an ion gauge and convection gauge.

*Faculty Mentor: Bruce Johnson, Chemistry and Physics, bjohnson@AState.com*

**Welicky, Rachel** – Environmental Sciences, Graduate

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## **PARASITISM BY *ANILOCRA HAEMULI* ON FRENCH GRUNT (*HAEMULON FLAVOLINEATUM*) IS ASSOCIATED WITH HOST SOCIAL AFFILIATION AND AGGREGATION SIZE**

Cymothoid isopod, *Anilocra haemuli*, is one of the largest ectoparasites to infect an ecologically important Caribbean coral reef fish, *Haemulon flavolineatum* (French Grunt). *A. haemuli* prevalence (percent of *A. haemuli*-infected fish) and its correlates remain unknown, making studies on *A. haemuli*-French grunt trophic dynamics difficult to develop. To quantify *A. haemuli* prevalence and its correlates (social affiliation, population and aggregation size), we conducted reef surveys for 3 year in the Caribbean. Prevalence varied from 0-66%, was greater for solitary than aggregating fish and was inversely correlated with population and aggregation size. Our prevalence dataset is the most comprehensive of any *Anilocra* spp., and provides the necessary data for future host-parasite trophic studies.

*Faculty Mentor: Paul Sikkell, Biological Sciences, psikkel@AState.edu*



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**Wolf, Jared** – Mathematics, Graduate

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## **A NEW TECHNIQUE FOR MULTIPLE COMPARISON TESTING**

Multiplicity is a well-known issue in statistics that arises when simultaneously testing  $n \geq 2$  individual hypotheses, often after the rejection of the global null hypothesis in ANOVA. As a result numerous multiple comparison procedures have been developed and are utilized abundantly in clinical trials. The proposed procedure is a hybrid between the data-driven Weighted Holms procedure and the Fallback procedure which relies heavily on the a priori ordering of the hypotheses in question. Strong control of the family-wise error rate at significance level can be proven. Examples are explored and simulation results provide evidence that the proposed procedure outperforms the Weighted Holms in a multitude of scenarios while increasing success compared to the Fallback as  $n$  increases.

*Faculty Mentor: Hong Zhou, Mathematics and Statistics, hzhou@AState.edu*

**Wright, Randi** – Nursing, Undergraduate

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## **EMERGENCY DEPARTMENT NURSES' PERCEPTIONS OF DECONTAMINATION**

Mass casualty events are a growing threat to public health. As the first hospital personnel to come in contact with victims, emergency department (ED) nurses' knowledge of decontamination is vital to protecting the health and safety of hospital patients and personnel. A breach in decontamination procedures may also threaten the integrity of the hospital and force a shutdown rendering the institution useless during the crisis. The aims of this study were to describe emergency department nurses' perceptions and knowledge of decontamination and to identify gaps that can be targeted for intervention. A 10-item questionnaire was administered to ED nurses at a local hospital. Data analysis is ongoing and findings will be presented.

*Faculty Mentor: Krista Snellgrove, Nursing, ksnellgove@AState.edu*

**Yang, Tianhong** – Molecular Biosciences, Graduate

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## **DECIPHERING THE BIOSYNTHESIS OF STILBENOIDS IN PEANUT**

The peanut plant produces several stilbenoids upon stress. Interestingly, the majority of them are prenylated. Among them, arachidin-1 and arachidin-3 are potentially beneficial to human health due to their antioxidant and anticancer properties. Hairy root cultures of peanut can be induced to produce and secrete diverse classes of prenylated stilbenoids upon treatment with elicitors, thereby providing a controlled and sustainable production system for these compounds. In this study, metabolomics and transcriptomics approaches are currently used to elucidate and characterize the mechanisms that affect the biosynthesis and accumulation of prenylated stilbenoids in peanut with the ultimate goal to improve the health-related properties of this important crop.

*Faculty Mentor: Fabricio Medina-bolivar, Biological Sciences, fmedinabolivar@AState.edu*





**Zhang, Ningning** – Molecular Biosciences, Graduate

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## **RECOMBINANT EXPRESSION OF A THERMOSTABLE ENDO-ARABINASE FOR EXTRACTION OF FUNCTIONAL OLIGOSACCHARIDES FROM PLANT CELL WALL POLYSACCHARIDES**

The overall goal of this project is to develop an efficient platform for enzymatic extraction of arabino-oligosaccharides (AOs) from sugar beet pulp or rice bran. AOs may be used in food and feed applications for healthful colon functioning as implicated by prebiotic, anti-inflammatory and mucosal immunomodulatory activities. Arabinase (ABN) is a key glycol hydrolase that can selectively cleave the arabinan chain of cell wall polysaccharides to release AOs. A thermostable endo-1,5- -L- ABN from *Bacillus thermodenitrificans* TS-3 was expressed with both the *E. Coli* and *Pichia Pastoris* systems. The yields and activity (including sensitivity to pH and temp) of the recombinant enzymes were characterized. The expressed ABN will be applied to beet pulp or rice bran to release AOs.

*Faculty Mentor: Jianfeng Xu, Agriculture, [jxu@AState.edu](mailto:jxu@AState.edu)*



# POSTER PRESENTATIONS

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ABSTRACTS LISTED IN ALPHABETIC ORDER BY LEAD PRESENTER



**Adams, Kelsey** – Biological Sciences, Undergraduate

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### **ANTITUMORAL ACTIVITY OF INTERFERON-GAMMA MADE IN PLANTS**

We used the plant model *Nicotiana benthamiana* as a transient system for production of pharmaceutical animal proteins, due to their safety, low cost, efficiency and simplicity to be scaled up. The murine interferon-gamma (mIFN- $\gamma$ ) was cloned into pBibKan vector with a 6X Histidine-tag in the c-terminal end of the protein to facilitate its detection and purification. The construct was transiently expressed in *N. benthamiana* leaves using a vacuum infiltration system. The highest level of protein expression (8  $\mu\text{g/gFW}$ ) was reached after 48 hours post-infiltration. Purified mIFN- $\gamma$  displayed molecular weights of 14.5kDa and 17.9kDa in silver stain and western blot assays. The antitumor activity of mIFN- $\gamma$  was determined by its ability to inhibit the proliferation of murine lymphoma.

*Faculty Mentor: Giuliana Medrano, Arkansas Biosciences Institute, gmedrano@AState.edu*

**Altom, Kacie** – Adult Health Nursing, Graduate

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### **IS THERE A RELATIONSHIP BETWEEN HEALTH LITERACY AND HBA1C IN ADULT PATIENTS WITH DIABETES?**

According to the Institute of Medicine (IOM) report, "Health Literacy: A Prescription to End Confusion," ninety million people in the United States have difficulty understanding health information. The objective of this study is to determine if there is a relationship between health literacy and HbA1c in adult diabetic patients over the age of 18 with type I or type II DM who have received diabetes education in the clinic and who present for follow-up. The study will take place at NEA Baptist Clinic in Jonesboro, Ark., and will use a descriptive non-parametric design with analysis conducted using the Spearman Correlational Coefficient. Outcome measures include health literacy score and HbA1c. Results and conclusions are pending completion of the study.

*Faculty Mentor: Darlene Baker, Nursing, dbaker@AState.edu*

**Arnoult, Keith** – Technology, Undergraduate

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### **PHOTOELECTROCHEMICAL HYDROGEN PRODUCTION USING CARBON-BASED MATERIALS**

Hydrogen is the most abundant element on the planet. Hydrogen can be used as a source of energy in a variety of applications. Unfortunately, there is not a sustainable source for hydrogen production. Most of the hydrogen produced today is from fossil fuel sources. In this research we explored hydrogen production through photo-electrolysis using carbon-based materials. The photo electrochemical cell or PEC uses water, sunlight, an anode and a cathode to split water molecules into hydrogen and oxygen. This electrolysis method allows for the production of hydrogen gas that is of high purity and readily available for use in a fuel cell or an internal combustion engine. The material used in this study was a carbon-based material composed of phosphorus and nitrogen co-doped mesoporous carbon (PNDC).

*Faculty Mentor: Rajesh Sharma, Technology, rsharma@AState.edu*





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**Blair, William** – Chemistry, Undergraduate

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## **HIGH THROUGHPUT PHENOTYPING APPROACHES TO IDENTIFY SALT TOLERANCE LINES WITHIN A RICE DIVERSITY PANEL**

Rice is the most significant crop for global food security. To keep rice productivity high, there is the need to develop new varieties capable of withstanding the increasingly saline soil conditions. This study is a collaborative effort between the Lorence and Walia Laboratories, in which we are applying high-throughput phenotyping approaches to identify novel sources of salt tolerance within a diversity panel. A selected group of rice lines including salt-tolerant and salt-sensitive types was sent to the Lorence team to analyze their response to salt stress at the early vegetative stage using the recently acquired Scanalyzer HTS. We have developed phenotyping protocols for the identification and characterization of salt tolerant rice lines, and will present our progress to date.

*Faculty Mentor: Argelia Lorence, Chemistry and Physics, alorence@AState.edu*

**Blanchard, Colleen** – Family Nurse Practitioner, Graduate

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## **BARRIERS IN PATIENT ADHERENCE TO CONTINUOUS POSITIVE AIRWAY PRESSURE THERAPY**

About 42 million American adults have obstructive sleep apnea (OSA). The prevalence of OSA is thought to be comparable to that of asthma or diabetes. Continuous positive airway pressure (CPAP) is first line therapy with short term treatment showing dramatic clinical improvement in sleepiness, daytime resting blood pressure, heart rate and left ventricular function. The purpose of this study is to determine what specific patient variables are barriers in adherence to CPAP therapy. A convenience sample of patients diagnosed with OSA completed questionnaires to assess for barriers to adherence to therapy. Data analysis is pending. Understanding the existing barriers to adherence is the first step in increasing sleep and quality of life for patients with sleep apnea.

*Faculty Mentor: Debbie Shelton, Nursing, dshelton@AState.edu*

**Booth, Audrey** – Rehabilitation Counseling, Graduate

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## **PROBLEM SOLVING THERAPY FOR WOMEN WITH TRAUMATIC SPINAL CORD INJURY**

This poster will display a proposed group therapy model for use in working with women who have experienced a traumatic spinal cord injury (SCI). This model is based on Maslow's Hierarchy of Needs (pre- and post-onset of disability) and use of Problem Solving Therapy (PST) to maximize rehabilitation outcomes (at each level of Maslow's "needs"). These may improve the overall quality of life (QOL) for each participant, by targeting issues such as physical accessibility, body image, relationships, intimacy, self-esteem, confidence and acceptance.

*Faculty Mentor: Peter Butler, Psychology and Counseling, pbutler@AState.edu*





**Breckenridge, Tiffani** – Animal Science, Graduate

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### **PREVALENCE RATES AND POTENTIAL RISK FACTORS OF SHIGA-TOXIN *E. COLI* 0157-H7 (STEC) ON BEEF CATTLE FARMS IN THE ARKANSAS DELTA**

The purpose of this study is to determine the prevalence rates of Shiga-toxin producing *E. coli* 0157-H7 (STEC) on beef cattle farms and to identify potential risk factors associated with on-farm STEC prevalence. Cattle are a major reservoir of STEC; therefore, STEC contamination of beef is a significant food safety concern in the U.S. Rectal swab samples were collected on 16 farms to test for STEC. The chi-squared test showed that the farms were different ( $P < 0.05$ ); 94% (15/16) of farms tested positive for STEC. The proportion of positive rectal swab samples was 62% (96/155). These data indicate that STEC is prevalent in beef cattle located in the Arkansas Delta; therefore, providing educational programs to beef producers with the goal of reducing STEC on their farms is warranted.

*Faculty Mentor: Donald Kennedy, Agriculture, dkennedy@AState.edu*

**Brown, Jason** – Electrical Engineering, Undergraduate

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### **STUDY OF VEHICLE HEADLIGHTS AND INTENSITIES**

According to the U.S. National Highway Traffic Safety Administration, nearly half of all traffic fatalities occur after dark, even though only 25% of traffic travels at night. Modern vehicle headlamps have become increasingly bright as technology has improved. Today's headlamps allow for greater visibility at night but on-coming traffic lights can disrupt the driver's field of view, endangering themselves and other drivers. Solutions to mitigate glare during night driving include; night vision glasses, night screens, etc. As part of a McNair research grant, the purpose of this study is to design a SMART-focusing LED headlamp that will detect on-coming vehicles to decrease light intensity as seen by other drivers in the passing vehicle while maintaining acceptable illumination of the terrain.

*Faculty Mentor: Shubhalaxmi Kher, Electrical Engineering, skher@AState.edu*

**Burnside, Candice** – Family Nurse Practitioner, Graduate

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### **EXERCISE AS A MEANS TO LOWER BLOOD PRESSURE**

An estimated 7,500,000 people die each year due to hypertension. The goal of this pilot study is to determine if residents with hypertension are aware that exercise can control hypertension. Methods: Convenience sampling, over one month, of 30-50 patients ages 18-65 years with a diagnosis of hypertension who seek treatment at a clinic in Jonesboro, Ark.

*Faculty Mentor: Debbie Shelton, Nursing, dshelton@AState.edu*







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**Fletcher, Tiffany** – Social Work, Undergraduate  
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## **AT RISK POPULATIONS AND PET ABUSE**

People who abuse animals are five times more likely “to harm humans” according to the Animal Legal Defense Fund. In the United States there are nearly 65 billion reported incidences of pet abuse each year. For women seeking shelter from abuse, over 71% reported that they stayed longer in the violence due to fear or prior experience of their pet being harmed (American Humane Association, 2013). Pet abuse resulting from domestic violence leads to unexplained injuries. Pets can also be abused by the children in the home, especially from children suffering from Reactive Attachment Disorder because of a parent who is unable to nurture their child in reacting to domestic violence. Increasing awareness about pet abuse is necessary as part of a community response to violence.

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**Lavespere, Kimberly** – Social Work, Undergraduate  
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## **LONG-TERM EFFECTS OF VIOLENCE ON CHILDREN AND ADOLESCENTS**

This presentation will identify indicators that children and adolescents have witnessed violence. Our goal is to help the community recognize signs of possible violence in the home in order to prevent negative lifelong consequences associated with exposure to violence. Research shows that long-term effects of violence can include aggression, substance abuse, anti-social behaviors, depression, and delinquent and violent behaviors. Early intervention with children and adolescents is necessary to promote healthy and stable transitions to adulthood and minimize the frequency of domestic violence.

*Faculty Mentor: Kathleen Carrick, Social Work, krcarrick@AState.edu*

**Camden, Harrell** – Mathematics, Undergraduate  
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## **CANONICAL CORRELATION IN REFERENCE TO EDUCATION AND PREDICTIVE SYSTEMS**

The purpose of this research is to see if there is any correlation between two sets of variables in a student’s life, and if these variables can be used to predict how well a student would succeed in college. The definition of success in college will be provided first. Randomly chosen students at Arkansas State University - Jonesboro are sent a survey that involved questions from both sets of variables. The answers for these questions were then used in the analysis to see if there exists a significant correlation using canonical correlation analysis. Then a predictive system is used to predict the success rate of the students.

*Faculty Mentor: Seo-eun Choi, Mathematics and Statistics, seo-eun.choi@AState.edu*



**Cannon, Veronica** – Family Nurse Practitioner, Graduate

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### **ARE PRIMARY CARE PROVIDERS DIAGNOSING HYPERTENSION?**

One third of American adults have hypertension, which is the primary contributing factor for more than 348,000 deaths. It costs the nation \$475.5 billion directly and \$3.5 billion in lost productivity annually. The purpose of this study is to educate primary care providers to become more aggressive in diagnosing and treating hypertension. Data was collected using a retrospective chart review by a convenience sample. Statistical analysis of a t-test will determine if hypertension is being diagnosed according to JNC VII guidelines. The expected result of this study is to diagnose and treat early stages of hypertension accurately and to prevent future organ damage, therefore, decreasing morbidity and mortality.

*Faculty Mentor: Lisa Waggoner, Nursing, lwaggoner@AState.edu*

**Cansler, Brandi** – Wildlife Ecology and Management, Undergraduate

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

Climate models predict changes in precipitation patterns that can dramatically affect wildlife populations if no adaptation occurs. We investigated the effect of weather conditions on feeding behavior, diet composition and water content, in Eastern Bluebirds. In 2013, we used ring-collars to sample prey fed to 14-day-old chicks. Their diet consisted of 26% Orthoptera, 26% Coleoptera, 24% Lepidoptera, 16% Arachnid, and 8% non-arthropods. The water content was  $4.31 \pm 1.63\%$  of prey body mass, but did not differ among orders. Bluebird parents made  $0.062 \pm 0.044$  trips/min to their brood. Chicks were visited less under rainy than clear or cloudy conditions. Our preliminary results thus suggest that bluebirds might be impacted in regions that would become wetter.

*Faculty Mentor: Virginia Rolland, Biological Sciences, vrolland@AState.edu*

**Caparas, Alyssa** – Biological Sciences, Undergraduate

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### **"SUGAR COATING" A RECOMBINANT PROTEIN THERAPEUTIC FOR IMPROVING FISH IMMUNITY**

Globally the aquaculture industry is growing and currently provides about half of the world's food fish. One issue in rearing fish at high density is increased spread of disease. To remain competitive, there is a need for improved health management strategies. A protein interleukin-22 (IL-22), which stimulates the innate immune system of fish, may provide a new, safe alternative to current disease control methods. Plant biotechnology can be used for recombinant IL-22 production. The challenge is that proteins are unstable in harsh environments. A recently identified Hyp-O-Glyco technology uses plant-specific glycosylation to attach protective sugars around the protein. If successful, this technology may increase the stability of functional protein therapeutics and improve aquaculture fish health.

*Faculty Mentor: Maureen Dolan, Biological Sciences, mdolan@smail.AState.edu*





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**Carter, Jon** – Nursing, Graduate

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## **PERCEPTIONS OF MASTER'S LEVEL FNP EDUCATIONAL PREPARATION FOR CLINICAL PRACTICE**

There is an increased demand for family nurse practitioners (FNP) because of the current changes in healthcare that increase access to the healthcare market. With increased demand comes an increase in educational programs to prepare the FNP for practice. The purpose of this study is to determine if master's level prepared family nurse practitioners feel their educational program adequately prepared them to care for their current patient population. A convenience sample of 25 FNPs were given a questionnaire consisting of questions related to education and preparedness to work as a provider. Data analysis is pending. With an increased demand for FNPs, educational programs must be designed to prepare FNPs to work at the highest level of practice to increase access to care.

*Faculty Mentor: Lisa Schafer, Nursing, lschafer@AState.edu*

**Castillo, Sonia** – Environmental Sciences, Graduate

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## **LINK BETWEEN FOLIAR ASCORBATE CONTENT AND COLD TOLERANCE IN RICE**

Rice production is affected by extreme weather events including sudden cold. Our collaborators at the USDA-ARS Dale Bumpers National Rice Research Center developed a cold-tolerance mapping population by crossing a cold-tolerant rice line with a cold susceptible one. Our previous studies show that Arabidopsis lines with elevated vitamin C (L-ascorbic acid, AsA) content are tolerant to cold stress. We hypothesize that in rice, cold tolerance is also associated to high AsA content. We are evaluating AsA content under normal conditions (30°C) versus cold (12°C) stress, in selected lines from the USDA-ARS's population (2 parents and 10 lines that display high or low cold tolerance). We are also monitoring plant health during stress with a new powerful phenotyping tool, the Scanalyzer HTS.

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**Cheyenne, Sheppard** – Mathematics, Graduate

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## **THE GIBBS SAMPLER: PROBABILITIES FROM THE POSTERIOR**

The Gibbs sampler is a statistical technique for the sampling of complex probabilistic models with applications to various physical, chemical and biological processes. Originated by Geman and Geman in 1984, and being named after J. W. Gibbs, the Gibbs sampler utilizes posterior or conditional distributions along with an initial sample point to generate a large set of data that, if successful, happens to converge to a target distribution, of which is used in calculating the desired statistically modeled phenomena. In this poster, the needed background ideas and techniques are explained to demonstrate applications of the Gibbs sampler in various research fields.

*Faculty Mentor: Choi Seo-eun, Mathematics and Statistics, seo-eun.choi@AState.edu*



**Childress, Blake** – Exercise Science, Undergraduate

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### **CAVITY BACKED IRONS VS. BLADES**

The average golfer today doesn't understand the differences between types of irons, let alone what a "blade" iron is. Usually, the cavity back iron is the preferred selection because it is easier to hit and has more "forgiveness." Research has shown that most people that prefer blades have a higher skill level. I plan to determine which iron is better with regard to skill selection, ease of shaping and the difference between the two. I will be using a mixed method in my research. I will interview golf instructors and conduct surveys of people who have played with both cavity back and blade irons.

*Faculty Mentor: Joyce Olushola, Sport Management, jolushola@AState.edu*

**Chowdhury, Nazmul Huda** – Civil Engineering, Graduate

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### **FORENSIC INVESTIGATION OF POOR-PERFORMING PAVEMENTS IN ARKANSAS**

As part of a major rehabilitation program in 2001, several sections of the Arkansas Interstate Systems were overlaid. Lately, some of these sections experienced severe distresses (rutting and cracking), but the others were performing well. The objective of the study is to evaluate root causes of the poor-performing pavements by forensic evaluation. Consequently, historical data and field cores from existing pavements have been collected. The collected samples are being inspected for defects and tested for mechanistic evaluation. Preliminary analyses of long-term performance data reveal that the aforementioned distresses exhibit strong correlation with the material properties. The findings of the study can be used as a good pavement management tool for timely pavement maintenance actions.

*Faculty Mentor: Zahid Hossain, Civil Engineering, mhossain@AState.edu*

**Chu, Yin-Lin** – Environmental Sciences, Graduate

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### **DEVELOPMENT OF A WIRELESS SENSOR NETWORK FOR MONITORING AND MANAGING IRRIGATION EVENTS IN PRODUCTION AGRICULTURE**

The inclusion of automation in agricultural irrigation may improve management by providing organized, site-specific and real-time information to producers. The objective of this study was to develop a rugged, low-cost wireless sensor network and infrastructure to retrieve, process and disseminate remote sensor data. Two working prototypes were assembled and field tested for furrow and flood irrigation. Data collected included soil moisture and water depth. Both systems retrieved, processed and disseminated field condition data from the production field to a mobile device via a cloud service. Information on mobile devices included alerts and graphical information regarding field conditions. Future work will quantify the benefits and costs of using these wireless sensors networks.

*Faculty Mentor: Michele Reba, USDA-ARS, Michele.Reba@ARS.USDA.GOV*





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**Ryals, Elizabeth** – Physical Therapy, Graduate

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## **RETENTION RATES: TRADITIONAL CLASSROOM VERSUS ONLINE**

This study compared retention rates of medical terminology content from traditional lecture and online classes. 42 students who had completed a Medical Terminology course in the previous 2 years volunteered for the study. 17 were from a traditional classroom. 25 were from an online course. Participants were administered a comprehensive medical terminology examination. The mean scores were 83.12 for the traditional course and 78.72 for the online course. All participants completed the course with a grade of "A." The traditional group had a higher retention mean score; however, the difference was not statistically significant. Recommendations for future research are utilizing numerical grades instead of letter grades at the conclusion of the course and larger sample sizes.

*Faculty Mentor: Stacey Sloas, Physical Therapy, ssloas@AState.edu*

**Cleaves, Darriel** – Exercise Science, Undergraduate

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## **EFFECTIVENESS OF COMPRESSION STOCKINGS**

The purpose of this study is to determine, if compression stockings are effective after having any type of leg surgery. Compression stockings can be used in everyday life, but are they effective after having surgery? There will be four participants in this study, two men and two women. Each patient will wear the compression stockings for 8 hours out of the day after they have surgery. Participants will do this for at least 3 consecutive weeks. The results of this study will provide information on whether compression stockings are effective after having surgery.

*Faculty Mentor: Joyce Olushola, Sport Management, jolushola@AState.edu*

**Clough, Timothy** – Physical Therapy, Graduate

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**Payne, Emily** – Physical Therapy, Graduate

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**Tice, Neal** – Physical Therapy, Graduate

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## **INFRARED LIGHT AS INTERVENTION TO IMPROVE PERIPHERAL SENSATION IN AN INDIVIDUAL WITH PERIPHERAL NEUROPATHY**

Peripheral Neuropathy (PN) affects nearly 20 million people in the U.S. We are investigating infrared (IR) light energy in an ongoing protocol to treat diminished peripheral sensation associated with PN. This presentation details a case-study of a 62-year-old Caucasian male suffering from diabetic peripheral neuropathy (subject from the larger study). We treated him 3 times weekly for 6 weeks using IR light energy. The patient demonstrated marked improvement in pain, function and sensation over the 6 week treatment period.

*Faculty Mentor: J. Stephen Guffey, Physical Therapy, jguffey@AState.edu*





**Colbert, Weslan** – Interdisciplinary Studies, Undergraduate

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### **DO COMPRESSION SHORTS ENHANCE ATHLETIC ABILITY?**

The purpose of my study is to observe whether athletic compression shorts enhance athletic ability. My hypothesis is that compression shorts only provide a placebo effect and contribute little to enhancement of athletic ability. This research could help determine the reality of the effectiveness of compression shorts. This study will require a mixed method. I will be using qualitative and quantitative techniques. I plan to ask questions to my participants before the experiment begins for the qualitative portion. The data recordings will serve as the quantitative method. I hope to obtain at least 6 participants of randomized gender and race, preferably people in college or older ages. Hopefully, one will gain a better understanding of the effectiveness of compression shorts.

*Faculty Mentor: Joyce Olushola, Sport Management, jolushola@AState.edu*

**Cooper, Jarius** – Sport Management, Graduate

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**Jason, Brooks** – Sport Management, Graduate

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### **SPONSORSHIP FEASIBILITY IN A DYING SPORT**

This study investigates how to find a permanent financial sponsor for major high school track and field meets. This sport has seen major sponsors come and go, yet still brings revenue in for both the meet and the surrounding area. Learning how corporate sponsorship was attended and why it was lost will aid in keeping events throughout many years. The loss of a couple of sponsors ended Nike Indoor and Outdoor Nationals and also the National Scholastic Track and Field meet. By interviewing former sponsors and the USA Track and Field Governing Board will help this feasibility study come to light.

*Faculty Mentor: LaVetter David, Sport Management, lavetter@AState.edu*

**Creameans, Jarrod** – Biological Sciences, Undergraduate

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### **ANNATTO HAIRY ROOTS: A POTENTIAL SUSTAINABLE SOURCE OF TOCOTRIENOLS**

The vitamin E family is composed tocopherols and tocotrienols. These compounds have been shown to minimize the risk of diseases due to their antioxidant properties. Furthermore, tocotrienols have been proposed as a potential preventive therapy for cancer. While tocopherols are abundant in nature, tocotrienols are only found in low quantities underscoring the need for a sustainable source for this class of bioactive compounds. High amounts of tocotrienols can be found in the seeds of annatto (*Bixa orellana*), a species from South America. Hairy roots are tissue culture systems that can produce the same compounds found in the entire plant. To this end, this research explores the biosynthetic capacity of hairy root cultures of annatto to produce tocotrienols.

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## **PROVIDER ADHERENCE TO THE ADA GUIDELINE FOR MEASURING URINARY ALBUMIN EXCRETION IN DIABETIC PATIENTS**

Background: Standards of care have been established to detect early nephropathy in diabetics through the use of an annual lab test to assess urine albumin excretion. Purpose: The aim of this study is to evaluate if health care providers are complying with established standards of care by performing an annual microalbumin test on diabetic patients. Methods: The study consisted of a convenience sample at a primary care clinic of 30 patients, ages 20 to 60, with diabetes. A retrospective chart review was conducted to assess if a microalbumin test had been performed on these patients within the past 12 months. Results: Pending. Implications for Practice: Early detection and aggressive treatment of nephropathy through the use of microalbumin testing is essential to improve outcomes for diabetics.

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## **COLLEGIATE ATHLETES' VIEWS ON WINNING AND CHEATING**

The purpose of this study is to show how athletes view “winning at all costs.” Sports has always faced a dilemma about what purpose it serves. Is it all about winning and losing? Friendly competition? Entertainment? Just having fun? Earning money/scholarships? This study aims to show why collegiate athletes participate in sports, how they view winning and losing, and how they feel about cheating. Have their views changed as they moved from little league sports to high school sports to collegiate athletics? How much have coaches shaped their viewpoints and would they want to play for a coach that has knowingly cheated? Sometimes players can take on the personalities of their coaches as well. Athletes need to clearly define their ethical stance to get along with their team.

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## **EARLY WARNING SIGNS OF SEXUAL ABUSE**

Sexual abuse can occur in many different ways. Sexual abuse is not limited to any certain age, race, gender, class, religion, geographic or personality group. There could be severe lasting effects on the victim. Children who are abused are at risk to become abusers themselves. If we could teach others to detect early warning signs or indicators of abuse, improve services to help those who have already been abused, and increase prevention services we could dramatically decrease the number of sexual abuse cases.

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### **RELATIONSHIP BETWEEN AGE, HOURS WORKED PER WEEK AND EXERCISE FREQUENCY**

Exercise is a vital part of health, but there are many factors that affect the frequency of how often a person exercises. The purpose of this research is to examine the effects that hours worked per week and age have on the frequency of exercise per week. 100 people were surveyed at the St. Bernards Health and Wellness Institute. The data was analyzed statistically and Pearson r correlation coefficient was used to find correlation among hours worked and age-with-exercise frequency. The correlation between exercise frequency and age was  $-.38$  and the correlation of hours worked and exercise frequency was  $-.12$ . The results suggest that exercise frequency does not have a strong relationship with age, or the number of hours a person works per week.

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### **APRN KNOWLEDGE OF ADA RECOMMENDATIONS FOR BARIATRIC SURGICAL TREATMENT FOR TYPE 2 DIABETES**

This study explores APRN's knowledge of American Diabetes Association's recommendations for bariatric surgery in treatment of Type 2 Diabetes Mellitus (DM). The diagnoses of DM has increased by 200% since 1980, thus knowledge of effective treatment is vital. Research confirms surgery can improve DM in persons with a BMI > than 35. The ADA states surgery is an appropriate treatment in this population and may be considered in people with a BMI of 30-35 if DM2 is poorly controlled. Bariatric Surgery as a treatment for DM is new, therefore, ensuring providers are up to date on information is essential. Health care providers are vital in the management of DM2. Their knowledge of current guidelines ensures patients receive appropriate referrals for surgery.

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### **ENVIRONMENTAL CONDITIONS OF BREEDING SITES IN NORTHERN ARKANSAS FOR THE SPOTTED SALAMANDER (*AMBYSTOMA MACULATUM*)**

My study investigates how the metal content in the environment and hepatic tissue varies among three populations of spotted salamanders (*Ambystoma maculatum*) in Northern Arkansas. To evaluate and compare environmental conditions among the different populations, I am using EPA chronic bioassays with aqueous samples taken from each site when spotted salamanders are active, during dry period(s), and after heavy rains. The presence of metals (As, Cd, Co, Cu, Cr, Fe, Mn, Ni, Pb) is being determined via atomic absorption spectroscopy. By comparing environmental conditions and metals in aqueous and sediment samples where salamanders are active to metals in salamanders' hepatic tissue, the bioavailability and persistence of the metals present at spotted salamander breeding sites may be determined.

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## **THE EFFECTS OF VIOLENCE ON CHILDREN AND ADOLESCENTS**

Youth in today's society are subjected to violence on a daily basis. They are exposed to violence in cartoons, video games, movies, or glamorized in the news. The effects of witnessing such violence on children and adolescents may lead to behavioral and developmental problems throughout their life. With no intervention, the cycle of violence is likely to continue. This presentation will address the need for education about long term exposure to violence to protect children and adolescents.

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## **THE RELATIONSHIP BETWEEN FOOT SENSATION AND BALANCE IN PATIENTS WITH DIABETES**

It is thought that persons with diabetes have balance impairments due to decreased foot sensation. It is also believed that these patients rely on their visual system for balance. However, diabetes also affects the small vessels of the eye, thus these patients may still rely on somatosensation for balance. We tested the foot sensation and balance of six people with diabetes. All subjects had decreased light touch sensation. The average balance score was 80.83 with a range of 66-90. Five of the six subjects relied most on vision for balance. One person relied more on vestibular input. The results of this study indicate that there is an association between balance deficits and poor foot sensation, but that somatosensation is still relied on for balance.

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## **ASSESSMENT OF DYSPAREUNIA**

Dyspareunia is a condition defined as painful or difficult sexual intercourse for females caused by a variety of etiologies. Health care providers must question whether the condition exists as women may not feel comfortable initiating the conversation. The purpose of this study is to determine if women in Northeast Arkansas who are 19 years and older perceive a lack of assessment for the diagnosis of primary and secondary dyspareunia when there are no presenting symptoms. A convenience sample was collected via questionnaires at the student health center on the campus of Arkansas State during the month of February and March 2014. Data analysis is pending. Bringing awareness to providers of the necessity of assessing for dyspareunia is vital to improve overall health for females.

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## **JURY DECISION MAKING FOR STALKING CASES WITH RELIGION**

According to Pennington and Hastie's (1993) story model, an important component in how jurors make decisions is their previous worldviews, one of which is religiosity. The goal of the current research is to examine the effects of religiosity on jury decision making in stalking trials. To accomplish this, participants' religiosity will be assessed and participants will be given a vignette about a stalking case in which the gender of the perpetrator, the type of interaction and the perpetrator's rationale for the stalking are varied. It is hypothesized that jurors who are highly religious will have a significantly more lenient or significantly stricter response when rendering a verdict for a stalking trial as measured by their verdicts and severity of punishment.

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## **ENGINEERING A DESIGNER POLYMER AS A MOLECULAR CARRIER FOR A THERMOSTABLE ENDO-ARABINASE EXPRESSED IN PLANTA**

Our objective is to utilize an innovative strategy, hydroxyproline -O-glycosylation, to engineer a novel "designer" polymer tag that can function as a "molecular carrier" for in planta-expressed glycosyl hydrolase. This will maximize enzyme function for post-harvest hydrolyzation of cell wall polysaccharides, e.g., those of sweet beet pulp, to release functional oligosaccharides. This project aims to provide a proof of concept by engineering in tobacco plant a designer polymer consisting of 18 tandem repeats of a "Ser-Pro-Pro-Pro-Pro" motif and attaching this polymer to a thermostable enzyme- 1,4- endo-arabinase (ABN)- that can hydrolyze arabinoglucuronoxylan. I predict that the designer polymer will help direct the accumulation of ABN in the plant cell wall and prevent ABN degradation.

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## **ENGINEERING A THERMOSTABLE E1 ENDOGLUCANASE IN PLANTA TO IMPROVE PLANT BIOMASS PROCESSABILITY**

Lignocellulosic biomass has been regarded as a sustainable feedstock for 2nd generation biofuel production. Reengineering the structural characteristics of the plant cell wall by in planta expression of cell wall-degrading enzymes represents a promising solution to overcome the recalcitrance of biomass and make wall materials more accessible to deconstruction. In this study, a thermostable E1 endoglucanase from *Acidothermus cellulolyticus* was engineered into tobacco as fusion with a (SPPPP)18 tag to improve the processability of the plant biomass. The (SPPPP)18 tag consisting of 18 tandem repeats of "Ser-Pro-Pro-Pro-Pro" motif presumably functions as a molecular carrier to direct the accumulation of the expressed E1 in cell wall matrix and protect the enzyme from proteolytic degradation.

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## **ADHERENCE OF NORTHEAST ARKANSAS DIABETIC PATIENTS TO PROVIDER RECOMMENDED ANNUAL OPHTHALMIC EXAMINATION**

Background: Early screening for diabetic retinopathy helps prevent the advancement of the disease. Problem Statement: Do patients aged 45 years or greater in Northeast Arkansas who have been diagnosed with type 1 or 2 diabetes for greater than 1 year adhere to provider recommended annual ophthalmic exams? Methods: Convenience sample of diabetic patients presenting to the clinic within a 3 week period and completed survey questionnaires. Results: Pending. Recommendations: Diabetic patients must receive annual ophthalmic exams in order to effectively screen for diabetic retinopathy and prevent the progression of vision hindering retinopathy. Healthcare providers must also recommend annual eye exams to their diabetic patients.

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## **OBSERVATION OF DMSO AND OXALIC ACID IN THE AQUEOUS PHASE USING ION CHROMATOGRAPHY**

Dimethyl sulfoxide (DMSO) is one of the main sources of gas phase SO<sub>2</sub>, a main atmospheric pollutant. This is thought to occur by the reaction of DMSO with several atmospheric oxidizing agents. One of the least understood oxidizing mechanism is the reaction between oxalic acid with DMSO. This mechanism is investigated here using reverse-phase ion chromatography. Various concentrations of oxalic acid (0.1M, 0.2M and 0.5M) were reacted with 0.5M. Results show an unidentified new peak and the disappearance of DMSO peak from the solution. This shows that the oxalic acid is oxidizing DMSO into another new compound. Preliminary analyses indicate that this new peak could be an intermediate in the degradation of DMSO towards SO<sub>2</sub>. Experiments are continuing to identify this new intermediate.

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## **SOYBEAN ANTHR CULTURE: A PRELIMINARY DATA REPORT**

Food is a constant world demand, and soybeans are among the most complete food crops which have fed people since its domestication (Guo et al. 2010; Hartman et al. 2011). Unfortunately, soybeans are difficult to work with in the biotechnology lab (Pratap et al. 2010; Somers et al. 2003; Thomas et al. 2003). In an effort to overcome this challenge, we report some preliminary data to produce double haploids (DH) in just one generation (Barnabas et al. 1999; Jain et al. 1996; Seymour et al. 2012). If we are successful, soybeans will become more malleable by shortening the in vitro growth time and obtaining superior yields, allowing future development of new and better varieties in a shorter and less expensive approach (Ferrie & Caswell 2011; Seymour et al. 2012).

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## **DOES EDUCATION MATTER: A LOOK AT HGA1C IN TYPE II DIABETICS AFTER ATTENDING A NUTRITIONAL COURSE**

Diabetic self-management education (DSME) is largely associated with improvements in glycemic control, particularly hemoglobin A1C (HgA1C). This study sought to determine if patients who have been diagnosed with type II diabetes mellitus for one to five years who have attended at least one nutritional course report a lower HgA1C. The research design used a brief, five-item questionnaire administered to a convenience sample of 15 willing participants in a rural clinic in Brinkley, Arkansas over a two-month period. Data analysis is pending. Understanding how type II diabetics, diagnosed for one to five years, perceive HgA1C levels after attending a nutritional course is necessary for future educational development.

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## **ISOFORM-SPECIFIC ROLES FOR AKT1 AND AKT2 IN PANCREATIC CANCER**

Pancreatic cancer has the worst prognosis among cancers with a 5-year survival rate at ~4%. Developing therapeutic targets is key for improving the outcome of treatment. Akt is a central signaling kinase implicated in uncontrolled cell survival and proliferation as well as cancer invasiveness. Targeting Akt has been pursued for pancreatic cancer; however, roles of Akt isoforms in pancreatic cancer remain largely unknown. We silenced Akt1 and Akt2 in cancer cells and found that depletion caused distinct morphological phenotypes. We further identified isoform-specific roles in cell proliferation and apoptosis; while Akt2 stimulated cell proliferation and inhibited apoptosis, Akt1 had exactly opposing roles. Thus inhibiting Akt2 specifically may be a better strategy for pancreatic cancer.

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## **INHIBITION OF *KLEBSEILLA PNEUMONIAE* BY VISIBLE AND NEAR-IR RADIATION**

**Objective:** To determine the potential for visible and near-IR radiation to inhibit *Klebsiella pneumoniae*. **Methods:** *K. pneumoniae* was treated in vitro with 464nm, 850nm and a combined 464 & 850nm light emitted from a supraluminous diode (SLD) array. Doses of 3, 10, 30, 45, 60 J/cm<sup>2</sup> were used. **Results:** The results revealed statistically significant inhibition of *K. pneumoniae* for wavelength, dose and interaction of wavelength and dose. Post hoc analysis revealed that the combined 464 & 850nm wavelength at 45 and 60 J/cm<sup>2</sup> were significantly effective. A maximum kill rate of 96.19% was achieved with blue/IR wavelength at 60 J/cm<sup>2</sup>. **Conclusions:** A combined visible and near-IR radiation is an effective inhibitor of *K. pneumoniae*.

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## **PRIMARY CARE PROVIDER ADHERENCE TO SMOKING CESSATION GUIDELINES**

Smoking is the number one modifiable risk factor associated with many chronic diseases. Primary care providers (PCP) must address this topic with patients. This project will determine the percentage of Northeast Arkansas PCPs adhering to the current smoking cessation guidelines. A convenience sample of 30 patients will complete a questionnaire consisting of five questions regarding smoking; and whether their PCPs are addressing the issue with them. Data analysis is pending. The results will guide PCPs in discussing these guidelines with patients.

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## **THE POTTY INDEX: WHAT THE WORLD'S TOILETS TELL US ABOUT POVERTY, GOVERNMENT, ECONOMICS, AND HUMAN DEVELOPMENT**

Popular measures of poverty are fraught with problems of equivalency. I propose a new indicator called the Potty Index, or the percentage of each country's population with access to top levels of sanitation, as defined by the UN. Looking at Potty Index data, democracies, countries with good governance indicators, and wealthy countries were more likely to have a great Potty Index. However, the countries most likely to improve their PI scores from 2000-2010 were autocracies, countries with more microfinance activity, and those with fewer entrepreneurs. The effects of improving Potty Index scores between 2000-2010 were: increased wealth (except for the least developed countries), a drop in under-5 mortality, and increased life expectancy.

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## **DOES EDUCATION FOR CHF PATIENTS REDUCE HOSPITALIZATIONS AND READMISSIONS?**

Congestive Heart Failure (CHF) is a significant cause of hospital admissions and readmission. The fiscal and social implications in both the inpatient patient and acute care setting are a significant component of overall health care budget. Self-care and prevention education for heart failure patients has shown to be a crucial element in preventing or decreasing hospital readmissions. This study analyzes the literature on the CHF patient education and the effects on hospital readmissions. The research method was a chart review of 30 patients with CHF in Southeast Arkansas. Data findings analysis is in progress. Determining if education for CHF patients reduces hospital readmissions is important to improve the quality of life for patients and help decrease the fiscal implications of care.

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### **DOMESTIC VIOLENCE AND RELIGION**

On any given day in the United States, three women are murdered by their spouse or boyfriend. Research supports that domestic violence continues to be one of the nation's most pressing problems. Thirty-seven percent of all women seeking care in hospital emergency rooms are as a result of domestic violence related injuries. Family violence costs the nation from \$5 to \$10 billion annually in medical and all subsequent costs. A major source of support for families in the past has been the local church. This project will determine whether or not local church congregations acknowledge this violence in the home and what measures they help to provide in support for affected families.

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### **PREVALENCE OF INSOMNIA AMONG PREMENOPAUSAL APRNS**

Insomnia is a widespread health complaint that is frequently encountered by health care practitioners. It has also been recognized that people in high stress occupations may suffer with insomnia although many are undiagnosed. The purpose of this study is to determine if there is an increased prevalence of insomnia among premenopausal APRNs who are working at least 32 hours weekly. A brief 10 item questionnaire was distributed to a group of nurse practitioners at the monthly NANPA (Northeast Arkansas Nurse Practitioner Association) meeting. Demographic data and information on sleep habits was collected. Data analysis is pending. Understanding whether insomnia is more prevalent in working healthcare providers is essential so early detection and treatment measures can be provided.

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### **DECREASE IN CHILD SICK DAYS AFTER ADMINISTRATION OF YEARLY INFLUENZA VACCINATION**

Influenza can lead to numerous secondary infections in young children increasing the number of sick days experienced. The purpose of this study is to determine if mothers of children 6 months to 6 years recognize a decrease in sick days after administration of yearly influenza vaccination. Surveys were used to assess this decrease from a convenience sample of mothers of children 6 months to 6 years who presented to the Children's Clinic and Apache Drive Children's Clinic during the month of February 2014. Data analysis is pending. Determining if mothers see a connection between a decrease in number of sick days after administration of the influenza vaccination will help prove the significant importance of this vaccination in children ages 6 months to 6 years.

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## **RELATIONSHIP BETWEEN RSV AND ASTHMA IN PEDIATRICS**

Background: Evidence suggests that the Respiratory Syncytial Virus infection in infancy is connected with the development of asthma later in early childhood. Problem Statement: Are infants, less than 6 months in age, who have clinically tested positive for RSV at increased risk for the clinical diagnosis of asthma by the age 5 compared with infants, less than 6 months of age, without the clinical diagnosis of RSV? Methods: A retrospective chart audit was performed. A list of clinically diagnosed asthmatic patients was obtained from a pediatric office, which were under the age of 5 years. Results: Pending. Recommendations: Educate parents on the relationship between RSV and asthma and how risk factors such as cigarette smoke exposure do play a key role in the development of asthma.

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## **REACHING TARGET LDL GOALS EARLY: DIET MODIFICATIONS VERSUS STATIN THERAPY**

Approximately 16 million people in the United States suffer from coronary artery disease. Elevated total cholesterol and LDL levels have been identified as a key risk factor. Despite numerous studies citing statin therapy as first-line treatment, diet modification is still being prescribed initially and patients are not meeting the goals of a cholesterol level <200mg/dL or LDL level <100mg/dL. The purpose of the study was to see if statin therapy or diet modification was more effective at reaching goal. After a retrospective chart review, data was analyzed using a t-test. It was found that statins were significantly more effective at getting patients to goal than lifestyle modifications.

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## **THE RELATIVE INFLUENCE OF LANDSCAPE PROPERTIES ON AGRICULTURAL DRAINAGE SYSTEM METABOLISM**

Agricultural drainage systems, though considered for their ability to treat edge of field nutrient run-off, serve as channels that facilitate the transport of nutrients and other vital resources into aquatic systems. Availability of these resources in aquatic ecosystems ultimately influences stream metabolism and productivity. This study considered monitored stream metabolism within replicated experimental agricultural drainage systems to represent dynamic responses during a simulated storm runoff event. Two types of drainage systems in this study included mowed ditches with weirs installed and unmowed ditches without weirs. Results indicated mowed ditches with weirs installed were net heterotrophic while unmowed ditches without weirs were net autotrophic.

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## **EVALUATING SEX-SPECIFIC FORAGING HABITS OF NYCTICEIUS HUMERALIS IN AN INTENSLEY MANAGED FOREST**

There is a paucity of knowledge on the spatial habitat requirements of bats, especially in landscapes intensely managed for forest resources. Our objective was to evaluate sex-specific foraging habits of the evening bat (*Nycticeius humeralis*), an abundant species in Arkansas. We radio-tracked 39 evening bats (25 males and 14 females) from June 1 to August 14, 2013 in the Sylamore Ranger District, Ozark National Forest. *N. humeralis* tends to exploit multiple, diurnal roosts and uses multiple core foraging areas. Although more female-specific data are needed, our 2013 observations suggest that males and females exploit different foraging areas. This evaluation of *N. humeralis* will help determine if management regimes provide adequate foraging habitat for sexually segregated species.

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## **SUBSTANCE ABUSE AMONG YOUNG ADULTS**

The rates of abuse or dependence on alcohol or an illicit drug were found to be highest among young adults aged 18 to 25, with the highest among 21 year olds (SAMHSA, 2012). Substance abuse among young adults can lead to difficulties at college, work, and home. It can cause physical and developmental problems, damage to relationships, increased financial burdens, and place additional stress on a family. Substance abuse is correlated with motor-vehicle accidents and fatalities, increased domestic violence, child abuse, and criminal activities. Our goal is to raise awareness about the dangers and prevalence of substance abuse among this age group in Jonesboro. These efforts offer possible solutions for education, support, and resources to address addiction.

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## **HONEY IS THAT YOU: THE EFFECTS OF PLASTIC SURGERY ON FACIAL RECOGNITION**

The Cross Race Effect (CRE) is the ability to recognize faces of one's own race more accurately than faces of a different race. When participants are shown faces of their own race, they are more likely to process the faces holistically (i.e., as a single unit) as opposed to other race faces which are processed featurally (i.e., in parts). Our research aims to establish the CRE by showing images of Caucasian and African American women before and after reconstructive surgery. These women underwent either featural (e.g., nose reshaping) or holistic (e.g., face lift) facial modifications. We predict that the modification type and race will interact to replicate the CRE using these ecologically valid stimuli which depict actual physical modifications as opposed to computer manipulations.

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## **ADHERENCE TO SELF-CARE MEASURES IN CONGESTIVE HEART FAILURE**

Over one million people are hospitalized each year with congestive heart failure (CHF), making this one of the most frequent diagnoses requiring hospitalization in the United States. This research explores if patients aged 50-85 years old in Northeast Arkansas diagnosed with CHF adhere to self-care measures of daily weights, medication compliance, and a regular exercise regimen. A convenience sample was used to survey self-care adherence of CHF patients who presented to Cardiology Associates during the months of February and March 2014. Data analysis is pending. Patients who adhere to CHF treatments may be expected to have fewer symptoms and improve functional capacity which may lead to overall improvement in the quality of life and reduce health care costs.

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## **THE FORMATION OF HCL GAS AT A RANGE OF RELATIVE HUMIDITY**

The formation of hydrochloric acid (HCl) across a range of relative humidity is important to understanding natural atmospheric processes. The main HCl production pathway is air pollution onto metallic chloride, mainly sodium chloride (NaCl). NaCl is important because it is present in sea salt. Shortpath gas cell Fourier transform infrared spectroscopy (FT-IR) is used to analyze the rate of HCl formation from sulfuric acid H<sub>2</sub>SO<sub>4</sub> (16M) onto NaCl crystals. HCl rate of formation was found to vary as a function of RH. After 10 minutes the quantity of HCl formed is constant across all humidity.

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### **EFFECTS OF DIABETES SELF-MANAGEMENT EDUCATION AND TEACHING ON HGA1C LEVELS**

Diabetes is the 7th leading cause of death in the U.S. and cost \$245 billion annually. An estimated 347 million people globally are diabetic. Diabetes Self-Management Education (DSME) significantly reduces HGA1C levels to <7 % in the short-term post-education. Studies show HGA1Cs of <7% reduce complications of diabetes. The purpose of this study is to evaluate outcomes of DSME on HGA1C levels at 3, 6, 9 and 12 months. The method used was retrospective chart review of 749 charts, 54 met inclusion criteria. Results will be analyzed with independent two- tail t-test. Anticipated results are a decrease in HGA1C at 3 months and non-significant reduction in 12 mo. levels. In practice, this implies need for ongoing DSME and support of the diabetic patient in order to maintain glucose control.

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### **EFFECT OF LANDSCAPE AND VARIABLE SOILS ON *LYGUS LINEOLARIS* DISTRIBUTION IN MIDSOUTH COTTON**

Heterogeneous soils impact availability of nutrients and water for cotton (*Gossypium hirsutum*), affecting fruiting dynamics, maturity and yield. Crop variability may also increase spatially and temporally interactions with pest arthropods such as the tarnished plant bug (*Lygus lineolaris*). Zone management is a stratified sampling system, which has potential for increased arthropod sampling efficiency compared to grid sampling. Zones were based on soil electrical conductivity (EC). Lygus numbers were monitored in 24 zone sample sites for 10 weeks and on 72 ½ acre grid sites for four weeks. Spatial patterns in plant bug abundance reflected feeding and oviposition preference for larger cotton plants. Lygus spatial distribution more strongly related to landscape features.

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### **AQUATIC EFFECTS OF A LOCALIZED OIL SPILL ON LAKE CONWAY, AR AND ITS TRIBUTARIES**

Oil spills require great concern and steps to eliminate their effects should be introduced immediately, especially those involving old pipelines. This was the case for a Mayflower, Arkansas neighborhood in which approximately 794,936 L of Wabasca heavy Canadian crude oil spilled from a rupture in a section of the Pegasus pipeline. In this project, water and sediment samples collected in and around Lake Conway, were exposed to freshwater organisms. Chronic WET and sediment toxicity testing was performed on *Pimephales promelas*, *Ceriodaphnia dubia* and *Chironomus dilutus*. Results measured have shown sublethal effects for three of the sites sampled, suggesting continued evaluation. Maintenance and evaluation needs to be done regularly to minimize present and future environmental effects.

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## **PRODUCTION OF STILBENOIDS IN HAIRY ROOT CULTURES OF MUSCADINE GRAPE TREATED WITH METHYL JASMONATE AND CYCLODEXTRIN**

Muscadine grapes have been experimentally proven to be high producers of stilbenoids such as resveratrol, piceatannol, viniferin, and piceid. These compounds are important because of their antioxidant and anti-inflammatory properties and potential beneficial effects in human health. In order to produce these stilbenoids under controlled laboratory conditions, hairy root cultures of muscadine grape cultivars Fry and Noble were established. These cultures were treated with the elicitors methyl jasmonate and cyclodextrin with or without piceatannol. After 24 h treatment, stilbenoids were extracted from the tissue and culture medium and then the extracts were then analyzed by HPLC. We found that the elicitor treatment induced high levels of stilbenoids in these cultures.

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## **SCANDAL IN SPORT: DOES IT PAY OFF?**

The world of athletics is full of scandal, from academic dishonesty at the collegiate level to drug abuse and sexual misconduct. Despite such negative publicity, some sports figures seem to prosper with little to no negative consequences. When such negative press comes about, the media pounces on it, having a field day with such salacious news. The purpose of this study is to analyze the how such scandals affect sports figures. Some sports figures lose sponsors as a result of their behavior, while others may gain new sponsors. This study will review and analyze the Bobby Petrino scandal at the University of Arkansas, and the Michael Phelps Marijuana scandal. In analyzing each scandal, a focus will be placed on how each was handled as well as the outcome for each individual.

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## **ARE PREGNANT WOMEN WITH GONORRHEA RECEIVING ADEQUATE TREATMENT?**

Gonorrhea, the second most commonly reported sexually transmitted infection can cause maternal pain, sterility and infant blindness. The purpose of this research is to evaluate whether pregnant women, who test positive for gonorrhea during the initial prenatal visit, are treated with intramuscular ceftriaxone or the newly preferred treatment, intramuscular ceftriaxone with azithromycin. Treatment with ceftriaxone only is no longer effective. A retrospective chart audit of a convenience sample of 30 patients will be conducted. Data analysis is pending. It is imperative that health care providers follow current gonorrhea treatment guidelines in order to protect the mother and baby from avoidable, costly complications.

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### **PROMOTIONS AND GAME ATTENDANCE: DOES IT MAKE CENTS?**

The roles of marketing and promotions have become increasingly important to those in sport administration. It is important to increase the effectiveness of these functions to increase attendance at events, generate revenue, and develop an athletic program. Our purpose for this study is to find the impact of promotions on game attendance. Based on previous research, studies have shown that although promotions work, but only increase attendance moderately for a single event. We aim to gain data from the athletic department at Arkansas State as well as survey a sample of the student body on their opinions. We hope to gain a better understanding on how promotions affect game attendance in sport and which type of promotions work best.

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### **CHARACTERIZATION OF WATER QUALITY IN A TAILWATER RECOVERY SYSTEM ASSOCIATED WITH AGRICULTURAL PRODUCTION**

The increasing demand for food production necessitates agricultural practices that are efficient in both water and fertilizer usage to keep crop yields high. While conditions of drought and climate change can impact restrictive uses of water, groundwater depletion can often exceed rates of regional water recharge and bring greater attention to nutrient budgets associated with conservative water reuse. This study investigates the effects of on-farm irrigation system recycling on water quality throughout a row crop growing season. Thirteen sample sites were arranged into five groups having water transferal connectivity within the system. Monitored nutrient concentrations were higher during the growing season and attributable to fertilizer applications during the period.

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### **MONITORING FURROW IRRIGATION ADVANCE TIMES IN MID-SOUTH COTTON USING POLYACRYLAMIDE**

Groundwater levels are decreasing due to an increased demand for irrigation in Midsouth agricultural crops. Irrigation advance times in furrows treated with Polyacrylamide, or PAM, were compared to non-PAM treated furrows in a cotton plot scale study in northeastern Arkansas. Wetting front advance detection (WFAD) units were constructed to track advance times. WFAD units included water detecting probes and a GPS to geo-reference each data collection point. These units were deployed in the middle and lower portions of the furrows prior to the irrigation events. Results indicated that water advanced through PAM treated furrows at a faster velocity compared to the non-PAM treated furrows. This study illustrated the importance of WFAD units to track advance times in furrow irrigated crops.

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## **THE EDUCATIONAL PSYCHOLOGY COURSE IN UNDERGRADUATE MUSIC EDUCATION DEGREE PROGRAMS**

The purpose of this study is to examine educational psychology course offerings within undergraduate music teacher training programs at randomly sampled NASM-accredited institutions (n=256). The researcher is exploring the extent to which commonly taught concepts in educational psychology are emphasized in the context of music teaching and learning through a web-based survey of music methods instructors (n=121) at participating institutions. The study is guided by three research questions: (a) what are the demographics for the sampled institutions and the music methods instructors; (b) how is the educational psychology course positioned in the music education degree program; and (c) to what extent do music methods instructors emphasize educational psychology topics in their course(s)?

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## **SAME-SEX INTIMATE PARTNER VIOLENCE**

This presentation addresses the prevalence of intimate partner violence (IPV) in same-sex partner relationships. Although same-sex IPV is often overlooked, it tends to occur at close to the same rate as violence in heterosexual relationships. Complicating factors include gender bias, specific aspects of same-sex partner violence such as financial dependency, and whether the person is out in all facets of their lives, personal and professional. Additional concerns include a lack of proper training in law enforcement officials to respond to same-sex violence, court rulings that recognize same sex IPV and a scarcity of resources including shelter or other support systems for someone abused by a same-sex partner.

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## **FACTORS CONTRIBUTING TO YOUTH DATING VIOLENCE**

Dating violence is a problem that affects youth (ages 16-24) across the nation. A lack of life experience in understanding relationships, as well as a lack of knowledge about dating violence, are contributing factors to dating violence. Age, gender bias, financial dependency, and sexual orientation also are correlated factors. Violent relationship behaviors often begin in adolescence. In the U.S., an estimated 1.5 million high school students a year report they were physically abused by a dating partner. Nearly 40% of adolescents report they have been physically or sexually abused by a dating partner, and 44% of college graduates report they have already experienced an abusive relationship.

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## **LOW SUSCEPTIBILITY OF INVASIVE INDO-PACIFIC RED LIONFISH (*PTEROIS VOLITANS*) TO A COMMON CARIBBEAN ECTOPARASITE**

Indo-Pacific red lionfish, *Pterois volitans*, are a successful invader in the tropical Atlantic Ocean. We hypothesize that one reason the lionfish has such success is that it is not susceptible to parasites in the introduced range. The parasite *Neobenedenia melleni* infests a wide range of hosts in the Caribbean. However, it has not been found on lionfish. Therefore, the goal of this project was to determine whether *P. volitans* is susceptible to infection by *N. melleni*. Lionfish (n=25) were placed in a facility containing *N. melleni* larvae. Despite exposure to the parasite, a single parasite was found. Therefore we suggest that *P. volitans* is resistant to infection by *N. melleni*.

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## **REFLECTANCE AND ABSORBANCE OF COATED AMMONIUM SEED AEROSOLS USING UV-VIS SPECTROSCOPY**

Aerosols, solid or liquid particles suspended in the atmosphere, play a vital role in our changing climate. Our understanding of the behavior of individual and/or coating of aerosols to reflect and/or absorb light is still limited. Ultraviolet (UV) radiation was used as a proxy for light, to study the reflectivity and absorptivity of selected aerosols of atmospheric aerosols. Ultraviolet Spectroscopy was used to study the reflectivity and absorptivity of ammonium chloride and ammonium sulfate aerosols with sodium chloride coating in the 380-950 nm range. Sodium chloride coating was found to increase absorbance in at 600 nm, indicating aged aerosols have higher absorptivity.

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## **LOWERING THE NEEDED DOSE: MANIPULATION OF LIGHT ENERGY TO INHIBIT BACTERIA**

We previously demonstrated that 405-nm light could inhibit growth of *Mycobacterium smegmatis*, however, the dose required was high (120 J/cm<sup>2</sup>). The objective of the current study was to determine whether a lower effective dose of light energy could be found. By combining 405-nm light with near-IR energy (850-nm) and manipulating the rate of energy delivery, we demonstrated a significant inhibition of *Mycobacterium smegmatis* in vitro at a much lower dose (45 J/cm<sup>2</sup>).

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## **DOUCHING AS A RISK FACTOR FOR BACTERIAL VAGINOSIS**

Bacterial vaginosis is a condition where the normal vaginal bacteria become altered. The etiology is unknown. Douching is a potential risk factor for BV that is practiced by women although it is not recommended. The purpose of this study is to determine if females between the ages of 19-65 years old recognize douching as a risk factor for BV. A convenience sample of 30 females were given a questionnaire consisting of questions regarding the known risk of BV associated with douching, if they practiced douching and if they have had a history of BV. Data analysis indicates that the majority of women do not view douching as a risk factor for BV. Healthcare professionals must educate patients on this topic during wellness visits to stop this practice.

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## **SOURCE OF CHOLINERGIC PROJECTIONS TO INFERIOR COLLICULUS IN RAT**

The pedunculo-pontine tegmental nucleus (PPT) and the laterodorsal tegmental nucleus (LDT) are the source of cholinergic (ACh) input to the inferior colliculus (IC) in guinea pigs. There could be a difference in the source of ACh to the IC in other species. We used retrograde tracing with red beads (LumaFluor, Inc.) and immunohistochemistry to find ACh cells (ChAT, Chemicon # AB144P) that project to the IC in rat. Double-labeled cells (that contained both tracer and ChAT immunoreactivity) were present in PPT and LDT. No double-labeled cells were found elsewhere. We conclude that PPT and LDT are the sources of ACh in the IC in rat. This pathway is similar to that described in the guinea pig. PPT and LDT are parts of the reticular activating system and play a major role in arousal.

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## **DIABETIC SELF-MANAGEMENT EDUCATION: ARE PATIENTS BEING REFERRED?**

Diabetes is a chronic disease that affects approximately 347 million people worldwide with about 3.4 million dying from the results of diabetes. Good glycemic control helps prevent complications from diabetes, and research has shown that diabetic self-management education (DSME) helps improve glycemic control. According to the Arkansas Department of Health (ADH), less than 40 percent of diabetics are referred for diabetic education. This research study was done to determine if all Type 2 Diabetics have been referred for DMSE at time of diagnosis. For this study a retro review of 129 diabetic charts were reviewed over a three year time period. Results revealed that only 12 of the 129 charts were new diabetics and none were referred for education.

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### **USING MOBILE-APP TECHNOLOGY TO IMPROVE EDUCATION FOR STUDENTS WITH ASD**

Students with autism spectrum disorder (ASD) suffer from hyperacusis, a condition wherein sounds in the typical environment are perceived as noxious. Hyperacusis predisposes students to avoidance behavior, adversely impacting educational outcomes. Unfortunately, little is known about the acoustic load experienced in the school environment. A better understanding of the relationship between the sound environment and educational outcomes is needed. We aim to use mobile sensing technology to record sound loads and GPS coordinates, helping to establish hyperacusis hot spots. This information will help educators and healthcare professionals to minimize the effects of hyperacusis and better accommodate students with ASD.

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### **HARD KNOCKS: AN ANALYSIS OF HITS INCURRED BY ADOLESCENT FOOTBALL PLAYERS DURING ONE SEASON OF PLAY**

Football-related concussions have received increased attention amidst fears of long-term neurological sequelae. While the factors that contribute to risk for injury have yet to be elucidated, evidence suggests that cumulative trauma, equipment and technique contribute. Unfortunately, most studies on the topic have focused on professional or collegiate athletes. The current study characterizes the nature of hits incurred by adolescent football players during one season of game play. Our observations show that player position, experience, and technique are major factors determining risk for injury. The results of this study can be utilized by players and coaches to identify high risk positions for developing concussion-like symptoms during football participation and improve monitoring.

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### **HIGH THROUGHPUT PHENOTYPING OF HIGH VITAMIN C TOBACCO LINES**

Vitamin C (L-ascorbic acid, AsA) plays a key role in protecting animal and plant cells from oxidative stress. Elevating AsA content in plants increases their nutritive value, lengthens their shelf life, and positively affects their tolerance to stresses. The Lorence Group has demonstrated that Arabidopsis plants over-expressing a myo-inositol oxygenase enzyme (a.k.a. MIOX4) have elevated AsA, and display enhanced growth rate, biomass accumulation, and tolerance to multiple stresses including salt, cold, heat, and pollutants. However, little is known about the effect of over-expressing this enzyme in other species. In this work we will present our progress on the characterization of tobacco lines that express the AtMIOX4 transgene using a high throughput phenotyping platform.

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## **MORPHOLOGICAL AND COMPOSITIONAL ANALYSIS OF ELECTRODEPOSITED INDIUM (III) SULFIDE (IN<sub>2</sub>S<sub>3</sub>) FILMS**

In the last few years, notable progress has been made in understanding the growth mechanisms for thin films for PV applications. Electrodeposition continues to be a complex deposition technique that can lead to low-quality material regions (cracks) in the deposited material. Such cracks form porous zones on the substrate and diminish the heterojunction interface quality of a PV cell. Electrodeposition of In<sub>2</sub>S<sub>3</sub> films was systematically and quantitatively investigated by varying the deposition parameters including composition of the solution, current density, time and temperature. Their effects upon the film growth mechanism, composition, and morphology were studied using scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDS), and fracture and buckling software.

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## **THE FIBONACCI SEQUENCE: HISTORICAL SIGNIFICANCE, RELEVANCE IN NUMBER THEORY AND SIMILAR RECURRENT SEQUENCES**

Sunflowers, pinecones, and the Mona Lisa — what do they all have in common? The Fibonacci Sequence! The sequence is a recurrent sequence that is generated by adding the two previous terms to create the next. It begins with 1, 1, 2, 3, 5, 8, ... and continues indefinitely it is also directly connected to the Golden Ratio. It can be generalized and characterized by altering the two “seed,” or starting numbers. A deeper investigation involves similarities and differences between the Fibonacci sequence and its generalized forms when generated backwards. Additionally, the investigation will examine similar recurrent sequences such as Lucas and Kimberling Sequences.

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## **LONG TERM HEALTH EFFECTS OF ANABOLIC STEROID USE IN ATHLETES**

Many people use anabolic steroids despite the negative health effects they can have. The use can cause effects such as elevated blood pressure and can even result in sudden cardiac death (Hassan, Salem, & Sayed, 2009). Tests done with mice show a drastic decrease in lifespan when administered steroids for six months (Parssinen & Seppala, 2002). With this kind of evidence, who would continue to use this substance? The purpose of this study is to identify major health concerns of steroid use. I will be reviewing research journals and past experimental results on the subject in order to gather my information. Once the research is complete, athletes should be able to educate themselves on these adverse side effects so that they can make an educated decision when it comes to using steroids.

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### **THE EFFECTS OF DIABETES IN ADOLESCENTS: A CASE STUDY**

This study examines the impact of diabetic neuropathies on two adolescent patients with diabetes. The proprioception, peripheral sensation and autonomic nervous system function were assessed. Differences were seen in the nervous system function of the two participants. Both demonstrated an appropriate autonomic response to deep breathing. Patient 1 had a higher resting heart rate and a larger response than patient 2. Patient 1 attained a higher maximal heart rate during the Valsalva maneuver. Patient 2 had a higher Valsalva ratio than Patient 1. Patient 1 had more loss of sensation than Patient 2. No difference was seen in the tests of proprioception. Diabetes has an impact on the autonomic and sensory nervous system of adults and adolescents with diabetes.

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### **PREVENTION AND REDUCTION OF INTIMATE PARTNER VIOLENCE**

Increased awareness is crucial to preventing and reducing incidence of intimate partner violence. Education about healthy relationships has to start at an early age if we as a society want to prevent violence from harming both men and women. We need to hold abusive people accountable, improve knowledge about where and how to get help, and provide services that allow victims to learn to live without violence.

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### **IMPACT OF ORGANIZED SPORT PARTICIPATION ON ACADEMICS OF HIGH SCHOOL STUDENTS**

It is nearly common knowledge that regular physical activity has a positive impact on academic success. "In regards to physical activity, no other discipline can have more effect upon the human body" (Lumpkin 2012). The primary purpose of this study is to determine if high school sport participation leads to higher academic success in terms of grade point average than their non-athlete peers. The secondary purpose is to see what factors, if any, related to high school sport participation play a part in the increased academic success. Data will be collected by way of surveying current high school athletes and non-athletes. The hypothesis is that the athlete group will have higher academic scores due to a more structured schedule, increased role model presence and higher college aspirations.

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## **PUBLIC PERCEPTION OF LEGAL VS. ILLEGAL PERFORMANCE ENHANCER**

In sports today there is an ongoing controversy about the use of performance enhancing drugs. Most sports have strict guidelines, restrictions, and testing regarding these drugs. On the other hand, now there are new technologies and scientifically improved training and rehabilitation techniques that can provide similar “performance enhancements.” Should these technologies and methods be penalized and restricted just like the drugs with similar effects? It is the goal to gain the opinion of the public when it comes to this controversial subject by way of a survey. We will also determine what they perceive as the difference between a legal, and illegal performance enhancer.

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## **ETHICAL ISSUES IN SPORTS MEDICINE AND ATHLETE SAFETY**

For some time now athletic trainers have been faced with problems while working with athletes of many sports teams. The team’s athletic trainers, therapists, and physicians are obligated to have an athlete back into competition as safely and quickly as they can. There are many conflicts that may come around due to other obligations of the athletic trainers to the athlete and other members inside the program. This paper is designed to help understand the ethics of sports medicine, examining the ethical issues, and recommending ideas and methods for ethical issues and decision making.

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## **ARKANSAS NATIVE PLANTS AS A SOURCE OF LEADS FOR THE TREATMENT OF HIGH RISK PEDIATRIC HEMATOLOGICAL CANCERS**

The overall goal of this collaborative work is to investigate the native Arkansas flora as a source of new leads for the study and treatment of pediatric leukemia. We are collecting plants from the Mississippi Alluvial Plain, Crowley’s Ridge and the Ozark Plateaus, areas that have not been broadly investigated for natural products, and that might have great potential for providing species that produce biologically active compounds that can treat drug resistant pediatric cancers. Plant samples are being collected and identified using morphology-based identification as well as molecular-based approaches (DNA barcodes) by Arkansas State researchers. Dried samples of the identified species are being provided to the Rivas Group at St. Jude’s Children’s Research Hospital for screening of leads with anticancer activity.

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## **IMPROVING FOOTBALL HELMET IMPACT ABSORPTION TO REDUCE POSSIBILITY FOR CONCUSSION**

In most contact sports concussions are a major risk that can only be indirectly indicated based on the level of impact force; concussions cannot be prevented. Head injuries are hard to treat and take varying times to repair, some not completely repairable. This could cause the end to an athletic career, as well as long term neurological problems. This project is aimed at the need to prevent/reduce the possibility of concussions in sports requiring head protection. The main focus will be to find impact absorbing materials sandwiched to the exterior shell of a helmet. Helmets will then be mounted on an impact testing apparatus to simulate direct/shear impact forces. Results will be compared and correlated, and conclusions drawn.

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## **DOMESTIC VIOLENCE IN COMBAT VETS WITH POST TRAUMATIC STRESS DISORDER**

This presentation will examine the evidence of mandatory classes and screenings for combat veterans in preventing intimate partner violence. Research shows that combat veterans are 6.4 times more likely to suffer from Post-traumatic Stress Disorder (PTSD) than the general public. Criterion for a diagnosis of PTSD includes re-experiencing traumatic events, avoidance and hyperarousal. PTSD can also be complicated by co-occurring mental health issues such as depression, substance abuse, and anxiety disorders. Soldiers returning from combat deployment now have mandatory classes and screenings six months post-combat in hopes of reducing incidents of violence once home.

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## **COLLEGIATE SPORTS AND SPORTSMANSHIP**

Sportsmanship involves fair play, respect for oneself, others and sport. How can it be determined whether or not sportsmanship will be disregarded when it comes to winning during sport competitions? "Individuals employed by a [NCAA] member institution to administer, conduct or coach intercollegiate athletics and all participating student athletes shall act with honesty and sportsmanship at all times (Delaney, 2010)." The purpose of this study is to determine whether sportsmanship is still incorporated in sport, based on the opinions of collegiate athletes. Data will be collected via a survey given to collegiate athletes. This study will help to understand if there is a lack of sportsmanship at the collegiate level.

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**Sarah, Moore** – Family Nurse Practitioner, Graduate

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## **DO SMOKERS IN NORTHEAST ARKANSAS VALUE SMOKING CESSATION REMINDERS BY THE HEALTH CARE PROVIDER?**

This presentation will examine the evidence of mandatory classes and screenings for combat veterans in preventing intimate Tobacco smoking is associated with heart disease, lung disease and cancer. It also has a secondary health impact on nonsmokers exposed to second hand smoke. This study will determine if smokers in Northeast Arkansas value smoking cessation reminders (SCR) by their provider. A convenience sample of 30 smokers who presented to a clinic in Northeast Arkansas, January to February 2014 were surveyed. The value smokers place on SCR will be investigated using a Likert Scale to determine if the value rating is different based on demographics, age smoking began, or amount smoked per day. Data analysis is in progress. Current data supports SCR by providers, however little is known about whether smokers value these reminders or if this value differs based on the surveyed criteria.

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## **CORRELATION BETWEEN CONSUMPTION OF SALTY FOODS AND HYPERTENSION**

Hypertension is a worldwide epidemic and is the leading cause of death and second leading cause of disability. In 2000 approximately 1 billion people had hypertension defined as blood pressure greater than 140/90. The purpose of this project was to see if a correlation existed between how many servings of high sodium foods were consumed and how elevated the blood pressure reading was. The methods used to collect data included a questionnaire that identified several risk factors including a 48 hour diet recall and blood pressure reading for that visit. The results will be analyzed using a Pearson correlation coefficient. The results are expected to have significant implication for the nurse practitioner in early education of diet for patients with hypertension.

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## **PARENTAL REPORTED BARRIERS OF SPORTS PARTICIPATION IN THE EFFORT TO CONTROL TWEEN OBESITY**

Obesity is an issue of epidemic proportions in our country. In 2013, Arkansas ranked 3rd for adults and 6th for 10-17 year olds as the most obese state in the nation. Currently, only fifty percent of U.S. youth regularly participate in vigorous physical activity. The purpose of this study is to examine what barriers exist for parents preventing their 9-10 year old "tweens" from participating in after-school sports/activities. The methods used for data collection was a questionnaire to identify participation and specific barriers associated with non-participation. The results were analyzed using SPSS 17.0. The implication that these results have in practice is to encourage exercise at younger ages to prevent future health disparities.

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**Pringle, Brandon** – Sport Administration, Graduate  
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### **IS THE USE OF WEIGHT CUTTING IN WEIGHT-CLASS SPORTS ETHICAL?**

The pressure to excel in sport has caused the use of PED to soar as competition grows. The use of weight loss drugs help those participants reach that goal. For example, diet pills, laxatives, diuretics and self-induced vomiting has increased in WCS to achieve rapid weight loss. Is that ethical? The purpose of this research is to determine the ethical makeup of the athletes toward the use of weight-cutting methods. The participants will be asked to answer questions regarding the use of weight-cutting methods. They will also be asked to anonymously answer questions regarding possible use of such methods. The results will help researchers, as well as athletic governing bodies determine the attitude toward weight cutting methods. Questions will be recorded in a format for easy presentation.

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**Straitt, Nadine** – Environmental Sciences, Graduate  
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### **IMPACTS OF CONSERVATION PRACTICES ON RUNOFF FROM PRODUCTION SIZED FIELDS USING EDGE-OF-FIELD MONITORING**

The objectives of this research was to monitor the quality and quantity of the runoff from production sized cotton fields resulting from conservation practices implemented in two priority watersheds in Northeastern Arkansas. Water monitoring equipment was deployed in order to measure runoff, collect flow weighted samples for laboratory analysis of sediment, nitrogen and phosphorus, and allow for remote access via cellular connections. Fields were paired with one control using conventional farming techniques and the other having one or more conservation practices installed. Conservation practices included grass strips, cover crops, zone and nutrient management, and irrigation planning.

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**Summers, Chenoa** – Environmental Sciences, Graduate  
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### **SYNTHESIS AND CHARACTERIZATION OF TITANIUM DIOXIDE FILMS**

Titanium dioxide (TiO<sub>2</sub>) exhibits several beneficial properties: inexpensive, abundant, biocompatible, resistant to corrosion, and enhanced photochemical properties. Using a simple setup, electrochemical etching using an electrolyte solution can increase oxide layer thickness on bare titanium foil. Based on the electrolyte solution and etchant used, film thickness, crystallographic structure, and photochemical properties will vary. We examine the crystallographic structures produced using spectrophotoscopic reflectometry, x-ray diffraction and scanning electron microscopy.

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## **CAUSES OF CHILDHOOD OBESITY**

The CDC states that the percentage of obese children aged 6-11 years in the USA increased from 7% in 1980 to nearly 18% in 2010. The AHA found that childhood obesity leads to physical effects like a higher risk of diabetes, but also psychological issues like depression and therefore to study obesity is very important. The purpose of this study is to identify factors that contribute to childhood obesity, and methods to decrease this epidemic. The CDC divides causes into 10 categories. I will compare these 10 categories with environmental factors that may affect childhood obesity. Children cannot choose the environment in which they live or the food they eat. They have a limited ability to understand the long-term consequences of their behavior. They require special attention when fighting obesity.

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**Tate, Allison** – Physical Therapy, Graduate | **Besharse, John** – Physical Therapy, Graduate

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## **FACULTY PERCEPTIONS OF PHYSICAL THERAPY**

A survey was completed by 45 in the College of Nursing and Health Professions (CNHP) with a 48% return rate. Questions involved knowledge of the physical therapy (PT) profession. The purpose was to determine the perceptions of CNHP faculty related to PT practice in Arkansas. 60% describe PTs as allied health professionals. 100% responded that hospital stays are reduced by PT. 61% responded that PTs have direct access in Arkansas. Common conditions treated by PT were musculoskeletal disorders and sports injuries. When given a list of terms exercise, manipulation and sports were most frequently chosen as related to PT. Based on survey results, faculty members are knowledgeable about the general concepts of PT; however, misconceptions remain with specifics of practice in Arkansas.

*Faculty Mentor: Stacey Sloas, Physical Therapy, ssloas@AState.edu*

**Tovar, Jose** – Molecular Biosciences, Graduate

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## **ENZYME TECHNOLOGY HELPS REDUCE ENERGY USED DURING SUGAR BEET BIOMASS PROCESSING**

Sugar beets are targeted as a new biomass crop to support agricultural development in the Arkansas Delta. Sugar beet juice provides fermentable sugars for making biorenewable chemicals, and the pulp residue provides a high quality animal feed. Drying beet pulp to stabilize it for storage and shipping is a highly energy intensive process (up to 25% of total energy consumption). Our objective is to determine if enzymes can be used as efficient biochemical tools to lower energy costs for drying pulp. We hypothesize enzymes can modify cell wall structure in beet pulp to reduce its water-holding capacity, which will improve mechanical de-watering of pectin-rich pulp. This poster presents our advances to develop and apply defined enzymes for reducing beet pulp water-holding capacity.

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**Towne, Geral** – Family Nurse Practitioner, Graduate

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### **MALE HPV VACCINATION AND BARRIERS TO ACCESS**

Human papillomavirus (HPV) is a very common sexually transmitted infection (STI). There are two HPV vaccines available, but Gardasil is the only vaccine that protects males and females, aged 9-26, from HPV Types 6, 11, 16 and 18. The purpose of this study was to determine if males aged 18-26 were being immunized with Gardasil vaccine, and what barriers existed in obtaining the vaccine. This was examined through a questionnaire of 20 males aged 18-26 at the Arkansas State University Health Center through convenience sampling. Due to ongoing data analysis, results are pending. Identifying the barriers that exist in obtaining this vaccine is necessary, in order to develop a plan of action to overcome those barriers.

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**Walker, Devyn** – Psychology, Undergraduate

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### **SUICIDE & DEPRESSION PREVENTION IN COLLEGE STUDENTS**

This survey research was done to measure the rate and incidence of depression and suicidal ideation in college students. The research was also used to find what factors contribute to college students becoming depressed and suicidal. The results of this research will add to the body of research on depression/suicide and possibly help depressed/suicidal college students at Arkansas State University.

*Faculty Mentor: Sharon Davis, Psychology and Counseling, sharondavis@AState.edu*

**Walker, Blake** – Rehabilitation Counseling, Graduate

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### **LOW VISION AND ASSISTIVE TECHNOLOGY**

The focus of this poster is to demonstrate how individuals with certain low vision disorders visually perceive their environment and examine the advantages and disadvantages of assistive technologies used to treat those disorders. Images of what normal-sighted people see are compared to images of what people with low vision disorders see, with and without the use of assistive technology devices.

*Faculty Mentor: Peter Butler, Psychology and Counseling, pbutler@AState.edu*

**Ward, Ashley** – Family Nurse Practitioner, Graduate

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### **PERCEPTION OF INTRAUTERINE DEVICE AND WEIGHT GAIN IN NORTHEAST ARKANSAS PATIENTS**

Unintended pregnancies remain a healthcare concern in spite of the number of birth control methods available. Some methods of birth control are avoided due to significant weight gain. The purpose of this study is to determine if females between the ages of 19 - 40 years old in the Northeast Arkansas perceive whether intrauterine devices cause weight gain. Surveys were used to assess the perception from a convenience sample of female students who presented to the Arkansas State University's Wilson Health Center during the month of January 2014. Data analysis is pending. Understanding barriers to contraception that are perceived by child-bearing females can aid in the development of better education to influence change and decrease the number of unintended pregnancies.

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**Welman, Ania** – Biological Sciences, Undergraduate

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## **PROJECTED EFFECT OF A TORNADO ON THE WILDLIFE OF ARKANSAS STATE UNIVERSITY**

Previous meteorological records suggest a high probability for a tornado touch down on the Arkansas State campus. This will directly or indirectly create a great need for emergency response including mass casualty triage, emergency operations and on-site decontamination. Numerous professionals will be required to provide quick response and recovery. While human health and welfare are of prime importance, the effect on other organisms, including wildlife and research or teaching animals must also be addressed. This display lists the common organisms, including animals (and the plants necessary for habitat) that might be affected by a tornado touching down on the campus of Arkansas State University. This was a simulated disaster drill involving all First Year Experience students in Fall 2013.

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## **DESIRED CHARACTERISTICS IN A LONG-TERM MATE: AN EXAMINATION OF LGBTQ MATING PREFERENCES**

Humans have made attempts to understand the mechanisms underlying mate preferences for generations. Research in the fields of evolutionary as well as positive psychology offers some explanation of heterosexual preferences in a long-term romantic partner, yet both perspectives largely exclude the LGBT population. This study broadens the scope of current mate preference literature to include more detailed insight into non-heterosexual preferences. The data show that both heterosexuals and non-heterosexuals overwhelmingly rate character strengths and virtues as more important than traits posited by evolutionary theory when selecting a long-term romantic partner.

*Faculty Mentor: Amy Pearce, Psychology and Counseling, apearce@AState.edu*

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## **RECOGNITION BY YOUNG WOMEN OF PELVIC INFLAMMATORY DISEASE AS COMPLICATION OF UNTREATED CHLAMYDIA**

Chlamydia is a bacterial sexually transmitted infection that if left untreated can progress to pelvic inflammatory disease (PID). This infection occurs most frequently in young adults. The purpose of this study is to identify whether women acknowledge the relationship between chlamydia and pelvic inflammatory disease. A cross-sectional survey was administered to 30 women ages 18 to 24. The survey assessed if there was a diagnosis of chlamydia and if the patient knew signs and symptoms of chlamydia along with disease complications. Results are pending. The study results will guide health care providers in treating patients with chlamydia as well as educating their patients regarding this disease.

*Faculty Mentor: Lisa Schafer, Nursing, lschafer@AState.edu*



**Williams, Andrea** – Exercise Science, Undergraduate

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### **PREDICTING FITNESS IN ADULTS**

Physical activity is beneficial to good health. Early detection and prevention of chronic disease is important for people who are at high risk for illness. The purpose of this study is to examine whether fitness tests or level of activity of young children predicts future physical activity level and exercise habits as adults. A systematic review was conducted to identify studies that measured physical fitness or activity at different stages in life. The results of the reviews identified two studies with 700 or more males that showed a correlation between childhood physical fitness tests and activity level in adulthood. In conclusion, physical fitness tests and level of activity in childhood may predict levels of physical activity as adults, suggesting the person's risk for illness.

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**Darrington, Robert** – Civil Engineering, Undergraduate

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### **EVALUATION OF INTERFACIAL BOND STRENGTH OF CARBON NANOTUBES AND POLYMERS**

Carbon nanotubes (CNTs) are an alternative to many problems such as replacing steel to reduce weight in automotive design and shielding temperature sensitive parts with its high thermal resistance. These properties can help asphalt polymers prevent rutting due to temperature extremities, but the bond strengths at extreme weather conditions remain unknown. To this end, a framework for testing bond strengths of CNTs and polymers has been developed through the surface free energy (SFE) approach by following the sessile drop method. In this method, contact angles of three solvents of known SFE components with test specimens are being measured by using an optical contact angle (OCA) analyzer, which is found to be a simple and effective tool.

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**Wiseman, Jennifer** – Social Work, Graduate

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### **CONNECTION AND RESOURCES BETWEEN INTIMATE PARTNER VIOLENCE AND SEXUALLY TRANSMITTED DISEASES**

Intimate partner violence (IPV) and sexually transmitted diseases (STDs) can affect individuals regardless of geographic location, gender, sexual orientation, race, culture, education level, and social class. This presentation examines the intersections between IPV and STDs in the United States. It will review social service support resources available from national, state, and local organizations, examine limitations, and make recommendations to improve gaps in services.

*Faculty Mentor: Kathleen Carrick, Social Work, krcarrick@AState.edu*







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**Wood, Jessica** – Nursing, Graduate

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## **ATTRIBUTES OF RURAL NURSE PRACTITIONER OFFICE VISITS AND OVERALL PATIENT SATISFACTION**

With the evolution of health care consumerism, the emphasis upon patient satisfaction is unmistakable. Patient satisfaction has been linked with increased health care compliance and improved health outcomes. This research study will determine which actions by the nurse practitioner are valued most by the patient. A non-probability, purposive sampling of 30 patients from a rural health clinic in Northeast Arkansas will complete a questionnaire. The questionnaire will consist of questions regarding patient satisfaction based on specific nurse practitioner actions. Data analysis is pending. The ability to evaluate and measure patient satisfaction is essential in validating the existence of the nurse practitioner in the primary care setting.

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**Yactayo-Chang, Jessica P.** – Molecular Biosciences, Graduate

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## **TESTING THE EFFECT OF ASCORBATE ON HUMAN INTERLEUKIN 12 ACCUMULATION IN TOBACCO**

Human interleukin-12 (hIL-12) is a cytokine with promise as a vaccine adjuvant. Plants are an attractive platform for the production of complex proteins, as they can produce large amounts of functional proteins free of animal pathogens in a short period of time. Previous results from a collaboration between the Dolan and Lorence groups showed that Arabidopsis lines with elevated expression of ascorbate (AsA) and hIL-12 accumulated 70% more hIL-12, when compared to the parent line. To better understand the role of AsA in enhancing plant-based protein production, we are now working with tobacco, the preferred platform for protein production. To this end, we developed tobacco crosses of AsA over-expressers x hIL12. We will present our progress on the characterization of these crosses.

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## **ROLE OF THE ACTIN-REGULATORY PROTEIN CAP1 IN THE INVASIVENESS OF BREAST CANCER**

Cyclase-associated protein 1 (CAP1) is a key actin-regulatory protein, and mounting evidence suggests involvement in the invasiveness of a variety of cancers. To unravel its role in breast cancer, we efficiently knocked down CAP1 in cancer cells, and found that CAP1 depletion led to substantially increased cell motility and invasion. The knockdown cells were larger with a rounded shape and very well developed lamellipodia and actin arcs; these phenotypes are known to stimulate cell motility. We also found elevated FAK (Focal Adhesion Kinase) activity and increased numbers of focal adhesions. In summary, our results show a key role for CAP1 in regulating the actin cytoskeleton of breast cancer cells, and reveal a likely role for CAP1 as a suppressor of the invasiveness of breast cancer.

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The advisory committee extends special appreciation to Arkansas State University's Chapter of The Honor Society of Phi Kappa Phi for their financial support of **Create @ State**. Phi Kappa Phi is the nation's oldest, largest and most-selective honor society for all academic disciplines. This year, Phi Kappa Phi donated \$500 for the purchase of poster presentation easels. For more information about Phi Kappa Phi, please visit <http://www.phikappaphi.org>.

#### **SPECIAL AWARDS OFFERED THIS YEAR AT *Create @ State***

Phi Kappa Phi is awarding the "Phi Kappa Phi Love of Learning Award" to at least one undergraduate and one graduate poster presentation for scholarly works that exemplify the motto of Phi Kappa Phi.

The College of Sciences & Mathematics is awarding cash prizes for best poster and best oral presentation in the areas of biology, physical science, computer science and mathematics/statistics.

The College of Agriculture & Technology is awarding is a \$100 gift certificate from the Arkansas State IT Store for a poster or oral presentation that offers the best use of technology to solve problems in natural resource management.

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