


3-26-2011

## 41st Annual WKU Student Research Conference

Student Research Council, Western Kentucky University  
*Student Research Council, Western Kentucky University*

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**41<sup>st</sup> Annual  
WKU STUDENT  
RESEARCH CONFERENCE**



**Saturday, March 26, 2011**

**Gary A. Ransdell Hall  
Western Kentucky University  
Bowling Green, Kentucky**

# CONFERENCE SCHEDULE

- 7:30-8:30 am**      **Student Registration and Information Tables**  
Lobby/Atrium  
Breakfast Buffet Provided
- 8:30-10:00 am**      **Concurrent Paper Sessions I**  
Rooms 1002, 1003, 1089, 1091, 2002, 2003, 2005, 2006, 2008
- 10:00-10:15 am**      **Break and Information Tables**  
Lobby/Atrium
- 10:15-11:45 am**      **Concurrent Paper Sessions II**  
Rooms 1002, 1003, 1089, 1091, 2002, 2003, 2005, 2006, 2008, 2010
- 11:45-12:30 pm**      **Lunch Buffet**  
Lobby/Atrium
- 12:30-1:30 pm**      **Conference Special Guest Dr. Elizabeth Chiseri-Strater**  
Room 1074  
Introductory Remarks by Dr. Rodney King and President Gary Ransdell
- 1:30-1:45 pm**      **Break and Information Tables**  
Lobby/Atrium
- 1:45-4:00 pm**      **Concurrent Paper Sessions III**  
Rooms 1002, 1003, 1089
- 1:45-4:00 pm**      **Concurrent Poster Sessions**  
Rooms 2002, 2003, 2005, 2006, 2008, 2010
- 4:00-4:30 pm**      **Break and Information Tables**  
Lobby/Atrium  
Refreshments Provided
- 4:30-6:00 pm**      **Sigma Xi Speaker Dr. David Frayer and Awards Ceremony**  
Room 1074  
Introductory Remarks by Dr. Gordon Baylis
- 6:00-6:30 pm**      **Closing Reception**  
Lobby/Atrium  
Refreshments Provided

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WESTERN KENTUCKY UNIVERSITY  
IS AN INSTITUTIONAL MEMBER OF THE  
COUNCIL ON UNDERGRADUATE RESEARCH  
*Learning Through Research*

# INTRODUCTION

The WKU Student Research Conference showcases the scholarly activities of graduate and undergraduate students of diverse disciplines from across campus. An annual tradition since 1970, the conference has provided opportunities for thousands of students to present talks, performances, posters, exhibits, and displays on their research and creative endeavors.

WKU has a rich history of scholarly engagement of students. Scholarly activity has been defined as original and creative work that is shared with colleagues and the general public. Research is a form of scholarly activity that involves the discovery of new knowledge. Other forms of scholarship include the development of new technologies, methods, materials or uses; the integration of knowledge that leads to new understanding; and artistry that creates new insights and interpretations.\* As demonstrated by the Student Research Conference, students significantly enrich their academic experiences at WKU by engaging in scholarly activity.

Between 1970 and 2002, the WKU chapter of Sigma Xi, which is an international research society, organized and funded the WKU Student Research Conference. For the next three years, the conference was jointly sponsored and organized by Sigma Xi and the University Honors Program. In 2006, WKU hosted a weekend-long celebration of student scholarship that included the Potter College Undergraduate Conference on Friday and the annual WKU Student Research Conference on Saturday, the latter again sponsored by Sigma Xi and the University Honors Program. The following year, a special committee comprised of representatives of each college, the University Honors Program, and Sigma Xi organized the conference. In 2006-2007 Sigma Xi and the Office of the Provost and Vice President for Academic Affairs provided financial support for the conference.

In 2008 Provost Barbara Burch created the Student Research Council, a university-wide committee charged with promoting student scholarly activity on campus and organizing the annual student conference. Since that year, the Student Research Council has organized the annual Student Research Conference, with financial support provided by the WKU chapter of Sigma Xi and the Office of the Provost. For more information about student research at WKU, visit <http://www.wku.edu/studentresearch>.

The 41<sup>st</sup> Annual Student Research Conference is the biggest in the event's history. There are 135 paper presentations and performances, as well as 80 poster presentations and exhibits. A total of 149 undergraduate students and 66 graduate students are primary authors this year, and an additional 112 students are co-authors. The undergraduate participants include 61 Honors College and 29 Gatton Academy of Mathematics and Science students. A total of 124 faculty served as mentors, and 33 departments from all colleges are represented among the conference participants.

\* Weiser, C. J. (1996, March 7). The Value System of a University: Rethinking Scholarship. Retrieved 30 November 2010 at [www.ahec.edu/clemson/papers/weiser.html](http://www.ahec.edu/clemson/papers/weiser.html)

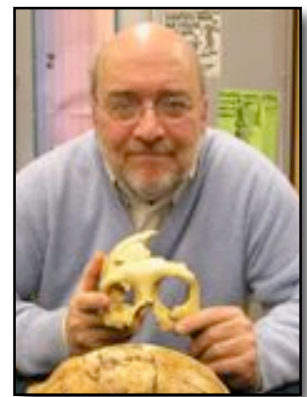
# CONFERENCE SPEAKERS

**Dr. Elizabeth Chiseri-Strater** is an associate professor in the Department of English at The University of North Carolina, Greensboro. She earned degrees in drama, education, and English from New York University and University of New Hampshire. Her interdisciplinary doctoral program at UNH focused on literacy and schooling. A literary educator for over 35 years, Dr. Chiseri-Strater currently teaches courses in creative non-fiction, composition and reading theory, literacy studies, and research methodology. In addition to her duties with the English Department at UNCG, Dr. Chiseri-Strater serves as the Graduate Director of Women's and Gender Studies Program. Dr. Chiseri-Strater continues to research the ways that ethnographic inquiry enhances literacy research. She has published extensively on teaching pedagogy, ethnographic research methods, academic literacies, and related topics.



Dr. Chiseri-Strater's presentation is entitled **Researching the University with an Ethnographic Lens**. Ethnography, the study of cultures and subcultures, provides a research opportunity for students to become engaged with researching the culture of the university, as well as subcultures that surround the university. This talk will suggest how ethnographic methodology can help students become better prepared for researching and understanding the institutions and cultures they will come in contact with throughout their lives, from their churches and volunteer non-profit agencies to their university and job sites. Dr. Chiseri-Strater will address how faculty can encourage student engagement with skills that allow them to observe and critique the ways that space is organized, rhetoric is used, interactions take place, and power is enacted in the many groups with whom students interact. The target audience of this lecture is WKU's entire student body and faculty.

**Dr. David W. Frayer** is a professor in the Department of Anthropology at the University of Kansas, Lawrence. He earned anthropology degrees from Miami University, Case Western Reserve University, and the University of Michigan. His research focuses on dental anthropology and the fossil record of human evolution in Europe from about 130,000-10,000 years ago. Current research projects include the Croatian Neandertal site of Krapina, dental morphology and health at the ancient Pakistani village site of Merhgarh, early *Homo* from Eritrea in northeastern Africa, and the so-called "hobbit" species from the island of Flores in Indonesia. Dr. Frayer has published extensively on the relationship between Neandertals and subsequent European populations, with topics ranging from language origins and Neandertal toothpick use



to evidence for human massacres in the German Mesolithic period and new interpretations of the famous European mummy Ötzi.

Dr. Frayer's presentation is entitled **Neandertals and Us**. Since their discovery in 1856, Neandertals typically have been considered a different species or offshoots from the subsequent European *Homo sapiens* line with little or no contribution to the people who followed them. Yet, a variety of skeletal traits link Neandertals with their European successors. Along with new information from Neandertal biology and culture, it is becoming increasingly difficult to eliminate them from a relationship to the Cro-Magnons who followed them in Europe.

The presentations by both speakers are open to the entire campus community. They are swipearable events for WKU students. Currently registered WKU students who have their IDs swiped at these lectures will be eligible for an **iPod Touch door prize**. One door prize will be awarded at each lecture, and students must be present to win.

## AWARDS CEREMONY

WKU faculty and professional staff will judge student presentations, performances, posters, and exhibits at the conference. The judges will select one winner from each of the 35 sessions listed on pages 9-24 in this program.

Conference session winners will be announced and acknowledged after Dr. Frayer's presentation in the late afternoon. All students who presented papers and posters at the conference, as well as family members, friends, faculty mentors, and administrators, are invited to attend.

Receptions with light refreshments will be held before and after the Sigma Xi speaker and awards ceremony.

## INFORMATION TABLES

Representatives from a variety of campus offices and organizations will be hosting informational tables in the Lobby/Atrium during the WKU Student Research Conference. Students are encouraged to visit the information tables throughout the day.

The **Office of Scholar Development** (OSD) supports WKU students throughout the process of finding and applying for nationally competitive scholarships, research opportunities, internships, and a variety of post-graduation opportunities. Whether you are looking for funding for a specific project or just curious about potential national and international scholarship opportunities, be sure to stop by our table.

Contact: Dr. Audra Jennings at [osd@wku.edu](mailto:osd@wku.edu)

**TopSCHOLAR®** is a university-wide, centralized digital repository dedicated to scholarly research, creative activity and other full-text learning resources that merit enduring and archival value, permanent and open access. WKU faculty, staff, and faculty-sponsored students are encouraged to publish in TopSCHOLAR®. The Student Research Conference will have a strong presence in TopSCHOLAR®. Go to [digitalcommons.wku.edu](http://digitalcommons.wku.edu) or just “Google” TopSCHOLAR®!  
Contact: Connie Foster at [connie.foster@wku.edu](mailto:connie.foster@wku.edu)

The **Office of Study Abroad and Global Learning** (SAGL) engages students, faculty and staff in a wide variety of educational and cultural experiences through faculty-led programs, exchanges, consortia, and other study abroad opportunities.  
Contact: Tom Millington at [study.abroad@wku.edu](mailto:study.abroad@wku.edu)

**Study Away** provides off-campus for-credit learning opportunities. Focusing on partnerships in creative learning, Study Away extends the classroom beyond the campus borders to increase a sense of citizenship and enhance American cultural understanding. Study Away offers students the chance to become better informed about the diverse resources and opportunities available throughout the United States and prepares them to have a positive impact on our nation and the world.  
Contact: Jerry Barnaby at [study.away@wku.edu](mailto:study.away@wku.edu) or [www.wku.edu/studyaway](http://www.wku.edu/studyaway)



The intellectual environment of the **Honors College** is designed for students who are interested in a highly selective private school experience surrounded by the resources of a robust state university. The Honors in the Major program may be of particular interest to current WKU students who are seeking an honors experience. Stop by our table for more information.  
Contact: Lindsey Westerfield at [lindsey.westerfield@wku.edu](mailto:lindsey.westerfield@wku.edu)

The **Office of Graduate Studies and Research** provides information regarding graduate programs available at WKU. Once admitted to a graduate degree program, students may apply for research grants to help support their research. If interested in graduate program opportunities at WKU, including admission requirements, please be sure to stop by our table.  
Contact: Dr. Lisa Murrell at [graduate.studies@wku.edu](mailto:graduate.studies@wku.edu)

The WKU **ALIVE Center for Community Partnerships** and the **Institute for Citizenship & Social Responsibility** are seeking graduate assistants for the Hill House program. Hill House is a graduate-level community development and research program at WKU that provides the opportunity for students to live at and work from a house bordering campus on projects that address local issues. If you are considering a graduate program at WKU in the fall and have an interest in learning how you can utilize your academic coursework to create impact in the community of Bowling Green, be sure to stop by our table for more information on this unique opportunity!  
Contact: Nadia DeLeon at 270-782-0966 or [nadia.deleon@wku.edu](mailto:nadia.deleon@wku.edu)



# ACKNOWLEDGEMENTS

Funding for the 41<sup>st</sup> Annual WKU Student Research Conference was provided by the Office of the Provost and Vice President for Academic Affairs, WKU Chapter of Sigma Xi, Honors College, and Carol Martin Gatton Academy of Mathematics and Science in Kentucky. The conference is organized by the WKU Student Research Council.

On behalf of the entire campus community, the members of the WKU Student Research Council extend appreciation and congratulations to the hundreds of students who participated in the conference. We applaud your talent, creativity, dedication, and commitment to making the most of your educational experience at WKU. Your passion for learning and academic excellence, as well as your motivation to meet and overcome challenges, not only distinguishes you from your peers, it serves as an inspiration to others. We are proud of your accomplishments, and you should be, too.

Undergraduate students who are in the Honors College are indicated with an asterisk (\*) symbol in the conference schedule. Undergraduate students who are in the Carol Martin Gatton Academy of Mathematics and Science in Kentucky are indicated with a caret (^) symbol in the conference schedule.

Faculty members who served as mentors to students are indicated parenthetically throughout the conference schedule and abstracts. We commend the faculty mentors for their support of student scholarly activities and for their assistance in preparing students for the conference.

WKU faculty/staff serving as conference judges are Khaldoun Almously, Shahnaz Aly, Ferhan Atici, Terri Baker, Tom Bell, Lauren Bland, Lorraine Bormann, Barbara Brindle, Jill Bryant, Walter Collett, Clinton Copp, Rajalingam Dakshinamurthy, Judy Davison, Tucker Davis, Patricia Desrosiers, Matt Dettman, Carl Dick, Kinchel Doerner, Mark Doggett, Lisa Duffin, Gordon Emslie, Xingang Fan, Jim Fulkerson, Marilyn Gardner, Erin Greunke, Peggy Gripshover, Lance Hahn, Jennifer Hanley, Beth Hawke, Margaret Hook, Cynthia Houston, Ted Hovet, Sandra Hughes, Kumi Ishii, Emmanuel Iyiegbuniwe, Trish Jagers, Angie Jerome, Guy Jordan, Ric Keaster, Molly Kerby, Jae Kim, Kate King, Gail Kirby, Alison Langdon, Deborah Logan, Eve Main, Rosemary Meszaros, Mac McKerral, Andy Mienaltowski, Jane Olmsted, Sarah Ostrowski, Tina Peterson, Keith Philips, Carrie Pritchard, Paula Quinn, Claire Rinehart, Michael Seidler, Elizabeth Sholar, Michael Smith, Roxanne Spencer, Ajay Srivastava, Amy Slowik, Mannie Webb, Aaron Wichman, Mary Wolinski, Cynthia Worcester, Jie Zhang, and Qin Zhao. We greatly appreciate the support of the faculty/staff judges.

Honors Toppers volunteers who assisted with the conference are Chris Kinney, Jordan Olberding, Mackenzie Perkins, Amanda Pursell, Suzanne Spalding, and Chad Willis.

Members of the Student Research Council are Darlene Applegate, Ellen Barringer, Steven Haggbloom, Audra Jennings, Rodney King (Chair), Christine Nagy, Farley Norman, Carnetta Skipworth, Michael Smith, Lawrence Snyder, and Derick Strode.

# PAPER SESSIONS I

## Graduate Paper Session 1: Natural Sciences

Room: GRH 1002

Judges: Mr. Tucker Davis (moderator) and Dr. Margaret (Peggy) Gripshover

- 8:30 **Rhonda Walker** A Biological Study of the North American Species *Apios priceana* (Dr. Todd Willian)
- 8:45 **Josh Gilliland and Josh Durkee** A Climatology of High-Winds Events from Post-Tropical Cyclones during 1951-2009 (Dr. Josh Durkee)
- 9:00 **Lakshmisri Vangala, Vivek Badwaik, and Chad Willis\*** Antibacterial Activity of Sugar Encapsulated Nanoparticles (Dr. Rajalingam Dakshinamurthy)
- 9:15 **Nezihe Turhan** Dynamic Programming on Non-Periodic Domains (Dr. Ferhan Atici)
- 9:30 **Margaret Hook and Bruce Schulte** Effect of Simulated Predation Risk on African Elephant Behavior (Dr. Bruce Schulte)
- 9:45 **Amera Almusharrf and Ferhan Atici** An Application of Fractional Calculus for Parameter Estimations of One Compartmental Model (Dr. Ferhan Atici)

## Graduate Paper Session 2: Social Sciences

Room: GRH 1003

Judges: Prof. Patricia Desrosiers (moderator), Prof. Rosemary Meszaros, and Dr. Gail Kirby

- 8:30 **Ifechukwude Okwechime and Ritchie Taylor** Environmental Assessment and Monitoring Regime for Atrazine in Drinking Water for Kentucky (Dr. Emmanuel Iyiegboniwe)
- 8:45 **Matthew Constant** One-to-One Laptop Project: Perceptions of Teachers, Parents, and Students (Dr. Marge Maxwell)
- 9:00 **Mo Zhang** Strategies for Building Trust through Self-Disclosure in the Neighborhood of the Hill House (Dr. Cecile Garmon)
- 9:15 **Morgan Lee** Identification with a Collegiate Football Team and Perceived Levels of Stress at the Game and at Home (Dr. Frederick Grieve)
- 9:30 **Oporuiche Ibekwe and William Mkanta** The Correlates of First-Time Alcohol Abuse Treatment in Formal Service Settings among Individuals in the State of Kentucky (Dr. William Mkanta)
- 9:45 **Prachi Chavan, William Mkanta, Tina Abrefa-Gyan, Shalini Singh, and Huma Ansari** Racial Differences in Diagnosis Among HIV/AIDS Female Veterans Receiving Care in VA Facilities (Dr. Grace Lartey)

### **Graduate Paper Session 3: Natural Sciences**

**Room: GRH 1089**

**Judges: Dr. Rajalingam Dakshinamurthy (moderator) and Mr. Thomas Bell**

- 8:30 **Lin Zhu** Electrically Controlled Formation and Release of Admicelles for Solid Phase Extraction (Drs. Eric Conte and Stuart Burris)
- 8:45 **Sean Vanderhoff, Jason Polk, Chris Groves, Ben Miller, and Carl Bolster** Assessing Groundwater Vulnerability and Epikarstic Transport of Organic Soil Amendments during a Major Storm Event in South-Central Kentucky (Dr. Jason Polk)
- 9:00 **Carly Sinderbrand and Bruce Schulte** Examining the Dominance-Stress Hypothesis in the Domestic Horse (*Equus caballus*) (Dr. Bruce Schulte)
- 9:15 **Avinash Bitra** Exploring the A\* Path Algorithm (Dr. David Erbach)
- 9:30 **Kelin Wang, William Orndorff, Yan Cao, and Wei-Ping Pan** Greenhouse Studies of FGD Amended Soil (Dr. Yan Cao)
- 9:45 **Dhatri Ravipati** Inhibition of Subtilisin by Analogs of the Anticancer Drug Cisplatin (Dr. Kevin Williams)

### **Graduate Paper Session 4: Natural Sciences**

**Room: GRH 1091**

**Judges: Dr. Emmanuel Iyiegbuniwe (moderator) and Ms. Beth Hawke**

- 8:30 **Kamal Humagain** Biogeographical Trends along Elevational Gradient in Nepal (Dr. John All)
- 8:45 **Christopher Ginter and Matthew Nee** Temperature Dependent Study of Nitrate Photolysis and the Effect of Hydrogen Peroxide (Dr. Matthew Nee)
- 9:00 **Yan Fen Li, Yan Cao, Christopher Carmichael, Hou-Yin Zhao, Wei-Ping Pan, and Bangbo Yan** Synthesis, Structures and Photocatalytic Properties of Novel Hybrid Solids from Keggin Ions and Metal Coordination Complexes (Dr. Bangbo Yan)
- 9:15 **Yajie Wang, Huifang Sun, and Michael Smith** Time-Course of Growth Hormone Effects in Zebrafish (*Danio rerio*) Auditory Hair Cell Regeneration (Dr. Michael Smith)
- 9:30 **Eric Vanover, Rui Zhang, and Yan Huang** Photocatalytic Aerobic Oxidation Via a Bis-porphyrin-Ruthenium(IV)  $\hat{1}/4$ -Oxo Dimer through a Putative Porphyrin-Ruthenium (V)-Oxo Intermediate (Dr. Rui Zhang)
- 9:45 **Gary Cundiff, Becky Gilfillen, Todd Willian, Annesly Netthisinghe, Roger Dennis, K.L. Cook, and M. LaCorbiniere-Baptiste** Using Arbuscular Mycorrhizae to Influence Yield, Soil Quality and Nutrient Uptake in Conventional vs. Organic Vegetable Production (Dr. Becky Gilfillen)

### **Undergraduate Paper Session 1: Humanities**

**Room: GRH 2002**

**Judges: Dr. Guy Jordan (moderator), Dr. Jennifer Hanley, and Dr. Jim Fulkerson**

- 8:30 **Stephen Tabor\*** Perceptions of Theatricality Embedded in Staging *The Spitfire Grill* (Prof. Tracey Moore)
- 8:45 **Ethan Millspaugh\*** A Masterpiece of Propaganda (Dr. Karen Schneider)
- 9:00 **Ryan Hunton** Poetry between the Lines: The Significance of Stage Directions in Eugene O'Neill's Plays (Dr. Walker Rutledge)
- 9:15 **Chelsea Kasten\*** The Air We Breathe: The Clean Air Act (Dr. Patricia Minter)
- 9:30 **Madalyn Schreiner** Exposing the Cracks in the Masks (Dr. Ted Hovet)
- 9:45 **Kristen Houser\*** Humans on Earth: How Communities in Five Bioregions are Adapting to a Changing Cultural and Ecological Landscape (Prof. Josh Meltzer)

### **Undergraduate Paper Session 2: Social Sciences**

**Room: GRH 2003**

**Judges: Prof. Jie Zhang (moderator), Dr. Jill Bryant, and Dr. Angie Jerome**

- 8:30 **Kirsten Belt\*** International Business Ethics: Models and Cases in Global Commerce (Dr. Ian Lee)
- 8:45 **Lesley Greenwell** Using the Web Wisely: Assisting the Nonprofit Sector with Technology Use (Dr. Jennifer Mize Smith)
- 9:00 **Kwabena Boateng\*** Xenophobia and Football (Dr. Jane Olmsted)
- 9:15 **Matthew Vaughan\*** Fair Trade Education and Awareness at WKU (Dr. Sam McFarland)
- 9:30 **Brandon Bowman\*** An Overview of Interdisciplinary Education and Its Utility in Public Relations Education (Prof. Ken Payne)
- 9:45 **Chelsea Frederick** Bowling Green Organic Market (Prof. Laura Leach)

### **Undergraduate Paper Session 3: Natural Sciences**

**Room: GRH 2005**

**Judges: Dr. Claire Rinehart (moderator) and Dr. Lance Hahn**

- 8:30 **Maggie Wilder, David Kem, and Albert Meier** Prescribed Fire Effects on Summer and Fall Herbs in Eastern Mesic Forests (Dr. Albert Meier)
- 8:45 **Kurt Woods\* and Christopher Byrne** Acoustic Properties of Carbonized Wood (Dr. Christopher Byrne)
- 9:00 **Morgan Maxwell\*** The History of Zoological Gardens and the Current International, Federal, and State Laws that Govern Them (Dr. Michael Stokes)
- 9:15 **Khushbu Patel\*, Andrew Allen, and Johnathan Whetstine** The Role of Lysine Specific Demethylase (JMJD2) (Dr. Rodney King)

- 9:30 **Lee Campbell, Kyle Berry, Dustin Jordan, Josh Durkee, Greg Goodrich, Rezaul Mahmood, and Stuart Foster** Synoptic Analysis of Mid-South Flood Event of May 2010 (Dr. Josh Durkee)
- 9:45 **Jacob Baxley** Detection and Identification of Unknown Materials Using Neutron-Gamma Spectroscopy (Dr. Ivan Novikov)

#### **Undergraduate Paper Session 4: Natural Sciences**

**Room: GRH 2006**

**Judges: Dr. Gordon Emslie (moderator), Mr. Mannie Webb, and Dr. Marilyn Gardner**

- 8:30 **Casey Sobon** ATV Robot (Dr. Stacy Wilson)
- 8:45 **David Evans** Analysis of Vegetation Health and Density within the Makalu Barun National Park, Nepal Using Supervised Classification of Remotely Sensed Data (Dr. John All)
- 9:00 **William Bickett<sup>^</sup> and Phillip Womble** Gamma-ray Spectra in Neutron-Based Explosives Detection Systems (Dr. Phillip Womble)
- 9:15 **Hannah Sellers** Adaptive Re-Use: Anthropologie Wedding (Prof. Laura Leach)
- 9:30 **Travis Morrison, Alex Berry, Kyle Moss, Phillip Womble, Melinda Whitfield, Tom Owens, and James Gantt** A Portable Community Infrastructure Resiliency System (Dr. Phillip Womble)
- 9:45 **Courtney Morrow** Testing Surface Integrity of Astronomical Telescope Mirrors through Specular Reflectance (Dr. Louis Strolger)

#### **Undergraduate Paper Session 5: Natural Sciences**

**Room: GRH 2008**

**Judges: Dr. Michael Smith (moderator) and Prof. Andrew Mienaltowski**

- 8:30 **Sarah Schrader<sup>^</sup>** Genomic Analysis of TT9, a Novel Mycobacteriophage (Dr. Rodney King)
- 8:45 **Drew Bewley, Douglas Harper, Bruce Hill, Landon Solomon, Mariano Ruiz, and Louis Santodonato** Sample Environment at the Spallation Neutron Source: An Automated Sample Environment Air Purge System (Dr. Douglas Harper)
- 9:00 **Dewayne Sowell, Drew Bewley, and Jay Hart** Use of Technology for the Preservation of Resources in African Villages (Dr. Mark Cambron)
- 9:15 **Clarice Esch<sup>^</sup>** Is *Collema sp.*, a Gelatinous Lichen, a Sustainable Source of Nitrogen for Greenhouse and Nursery Crop Production? (Dr. Martin Stone)
- 9:30 **Suzanna Sadler\*, Schuyler Wolff\*, and Andrew Gott** Tests of Environmental Effects on Type Ia Supernova Production (Dr. Louis Strolger)
- 9:45 **Kyle Berry, Dustin Jordan, Lee Campbell, Gregory Goodrich, Josh Durkee, Stuart Foster, and Rezaul Mahmood** Impact Analysis of the May 2010 Mid-South Flood (Dr. Josh Durkee)

# PAPER SESSIONS II

## **Graduate Paper Session 5: Natural Sciences**

**Room: GRH 1002**

**Judges: Dr. Barbara Brindle (moderator), Dr. Ric Keaster, and Dr. Judy Davison**

- 10:15 **Aditya Stanam and Gasana Janvier** Epigenetics and Asthma in Children: A Review (Dr. Christine Nagy)
- 10:30 **Angela Gunter** Motivation for High School Students to Read: Differences among Student Perceptions and Differences between Student and Teacher Perceptions (Dr. Marge Maxwell)
- 10:45 **Cecilia Mengo and Amy Cappicce** Social Work Department Study Abroad Programme in Kenya on Rural Mental Health Issues (Dr. Amy Cappicce)
- 11:00 **Daniel Jackel and Douglas Smith** The Effects of Computer Ownership, Internet Accessibility and Broadband Access on Educational Assessments (Dr. Douglas Smith)
- 11:15 **Deborah Reed** Control of Rabies in the Pet Population is Critical to Human Health and Safety in the Community (Dr. Emmanuel Iyiegbuniwe)
- 11:30 **Adam Hoette and John All** Building the Sustainable Home (Dr. John All)

## **Graduate Paper Session 6: Social Sciences**

**Room: GRH 1003**

**Judges: Dr. Lauren Bland (moderator), Dr. Aaron Wichman, and Dr. Marilyn Gardner**

- 10:15 **Scott Perkins, Katie Brown, Lindsey Greco, and Steven Wininger** Personal Strategies for Increasing Exercise Intensity and Enjoyment (Dr. Steven Wininger)
- 10:30 **Shana Wilson** The Relationship between Superstitious Behaviors of Sports Fans, Team Identification, Team Location, and Game Outcome (Dr. Frederick Grieve)
- 10:45 **Venkata Damera and Shalini Singh** The Financial Performance of the Hospital Systems in the Nashville Health Care Council (Dr. Gregory Ellis-Griffith)
- 11:00 **Wei Huang** The Use of Online Social Networks for Cultural Anxiety among International Students in the U.S. (Dr. Kumi Ishii)
- 11:15 **Zimple Kurlawala and Christine Nagy** Examining Perceptions of College Students about Organ Donation (Dr. Christine Nagy)
- 11:30 **Shalini Singh and Shailesh Advani** Emerging Patterns of Emergency Department Use among Residents of Midwestern States (Dr. William Mkanta)

### **Graduate Paper Session 7: Natural Sciences**

**Room: GRH 1089**

**Judges: Dr. Kinchel Doerner (moderator) and Dr. Sarah Ostrowski**

- 10:15 **Huajian (Thomas) Zhang** A Fire Hazard/Risk Analysis from a Geospatial Approach (Dr. Jun Yan)
- 10:30 **Chaitanya Rapolu, Dhatri Ravipati, and Kevin Williams** Inhibition of the Enzyme Papain by Analogs of the Anticancer Drug Cisplatin (Dr. Kevin Williams)
- 10:45 **Wan-Ting Tsao** Graphics: An Innovative Approach Used to Improve the Professional Knowledge of Management and Technical Management Foundation Course Based on Industrial Needs (Dr. Mark Doggett)
- 11:00 **Vivek Badwaik, Lakshmisri Vangala, and Rajalingam Dakshinamurthy** Molecular Level Interaction of the Human Acidic Fibroblast Growth Factor with the Angiogenic Drug Capped Gold Nanoparticles (Dr. Raja Dakshinamurthy)
- 11:15 **Yinu Wang and Lawrence Alice** Relationships among *Rubus* (Rosaceae) Species Used in Traditional Chinese Medicine (Dr. Lawrence Alice)
- 11:30 **Yaowen Cui, Yan Cao, and Wei-Pin Pan** The Preparation of Copper-Based Oxygen Carrier Using Coprecipitation Method (Dr. Yan Cao)

### **Undergraduate Paper Session 6: Social Sciences**

**Room: GRH 1091**

**Judges: Dr. Walter Collett (moderator) and Ms. Margaret Hook**

- 10:15 **Elizabeth Fugate\*, Natalie Schieber^, and Krysta Waldrop^** The Effects of Hydrogen Peroxide and Counterion on the Photolysis of Aqueous Nitrate Ion (Dr. Matthew Nee)
- 10:30 **Thomas Choate** Using Thermal Imaging to Evaluate University Campus Structures in Preparation for Weatherization Repair (Prof. Robert Choate)
- 10:45 **Cheryl Onwu\*, Cheryl Davis, and Aric Johnson\*** Preliminary Survey of Tick Vectors of Human Ehrlichiosis, Rocky Mountain Spotted Fever, and Lyme Disease in Warren County, Kentucky (Dr. Cheryl Davis)
- 11:00 **Christopher Hart and William Hess** Rock Units and Possible Fault Occurrences at McChesney Field Campus (Dr. Andrew Wulff)
- 11:15 **Kyle Golden** An Art Center for Those Who Don't Have a Place to Call Home (Prof. Laura Leach)
- 11:30 **Daniel Hinson\*** Synthesis of Some Group VII Pyridazine Complexes (Dr. Chad Snyder)

### **Undergraduate Paper Session 7: Social Sciences**

**Room: GRH 2002**

**Judges: Dr. Sandra Hughes (moderator), Dr. Lisa Duffin, and Dr. Kumi Ishii**

- 10:15 **Colleen Wynn\*** Hopelessly Disadvantaged Like You: A Comparative Study of Disadvantaged Youth in Mobile and Medellin (Dr. Holli Drummond)

- 10:30 **Amanda Beers\* and Farley Norman** The Transition from 3-D to 2-D Visual Stimuli in Gifted Education and Its Effect on Paired-Associate Learning (Dr. Farley Norman)
- 10:45 **Rebecca Schaefer\*** Exploring the Relationship between Facebook, Face-to-Face Communication and Intercultural Communication (Dr. Larry Caillouet)
- 11:00 **Emily Duke, Hayley Travis, and Darlene Applegate** Archaeological Survey of Forestville Saltpeter Cave, Hart County, Kentucky (Dr. Darlene Applegate)
- 11:15 **Christopher Ramsey** The Green Revolution: Iranian Dissidents (Dr. Scott Girdner)
- 11:30 **Emily Greenwood\*** Fannie and Freddie: America's "Affordable" Housing Crisis (Dr. Robert Pulsinelli)

### **Undergraduate Paper Session 8: Natural Sciences**

**Room: GRH 2003**

**Judges: Dr. Xingang Fan (moderator) and Ms. Cynthia Worcester**

- 10:15 **Eric Theiss** Lambda Chi Alpha Fraternity House (Prof. Laura Leach)
- 10:30 **Kelsey Kidd and Andrew Wulff** Timing of Emplacement of Dikes in the Cowhole Mountains, California (Dr. Andrew Wulff)
- 10:45 **John Jennings, Donald Slocum, Thomas Reinscheld, and Paul Whitley** Ortho-Metalation of Para-Bromo and Para-Iodoanisole Utilizing Ortho-Lithiodimethylbenzylamine (Dr. Donald Slocum)
- 11:00 **Jenna Wilson, Steve Buchanan, and Ron Rizzo** Disposable Remotely Operated Submersible (Dr. Stacy Wilson)
- 11:15 **Elaine Flynn\* and Andrew Wulff** Use of Zoned Minerals to Determine Petrogenetic Processes (Dr. Andrew Wulff)

### **Undergraduate Paper Session 9: Natural Sciences**

**Room: GRH 2005**

**Judges: Prof. Shahnaz Aly (moderator) and Ms. Lorraine Bormann**

- 10:15 **Chris Steele, Ben Topp, and Matt Bracken** Bio-Generated Greenhouse Heating System (Dr. Kevin Schmaltz)
- 10:30 **Ryan Gourley, John All, Sean Hutchison, and Kamal Humagain** Spatiotemporal Aspects of Fire in Nepal (Dr. John All)
- 10:45 **Keaton Smith^ and Daniel Dilger^** Form Evaluation Using Lexmark MFD Platform (Dr. Uta Ziegler)
- 11:00 **Kayla Herchenrader** Barren River Sports Center (Prof. Laura Leach)
- 11:15 **Jonathan Newton** Examining the Interstellar Medium for the First Stages of Stellar Formation (Dr. Steven Gibson)
- 11:30 **Matt Downen\*** The Formation History of Multi-Layered Chondrules in Acfer-139 (CR2) (Dr. Andrew Wulff)



### **Undergraduate Paper Session 10: Natural Sciences**

**Room: GRH 2006**

**Judges: Dr. Ferhan Atici (moderator) and Dr. Qin Zhao**

- 10:15 **Michael Simpson, Kyle Moss, Phillip Womble, Thomas Owens, and Melinda Whitfield** Waterborne Threat Interdiction with Underwater Impulse Generation for Coastline Defense (Dr. Phillip Womble)
- 10:30 **Marvin Conn, Christopher Driver, and Buddy Price** New Investigations of an Ancient River System: Refining Geologic and Models of Pennsylvanian Paleovalley Fills in Western Kentucky with Implications for the Development of Groundwater and Petroleum Resources (Dr. Michael May)
- 10:45 **Ben Howard<sup>^</sup> and Joyce Tucker<sup>^</sup>** A Mathematical Model to Analyze the Treatment of a Wound against Bacterial Infection (Dr. Richard Schugart)
- 11:00 **Anthony Merriam** Control Area Networks with the Freescale S12 Micro-processor (Dr. Michael McIntyre)
- 11:15 **Mark Bailey** The Coney Island Mall (Prof. Laura Leach)
- 11:30 **Daniel Price, Ian Blaylock\*, Celena Allen, Brenna Tinsley\*, Jennifer Thurmond, Jon Zambrano, Martha Caudill, T.J. Mann, and Kristin Smith** Economic and Social Implications of Peak Energy (Dr. Cari Bourette)

### **Undergraduate Paper Session 11: Natural Sciences**

**Room: GRH 2008**

**Judges: Ms. Erin Greunke (moderator) and Dr. Molly Kerby**

- 10:15 **Andrew Skinner** Family Recreation Facility (Prof. Laura Leach)
- 10:30 **Kevin Hinson\*, Marshall Henson, and Seth Renfro** Unbonded Capping System (Dr. Shane Palmquist)
- 10:45 **Curt Whittington** The Southern Kentucky Sluggers Sportsplex (Prof. Laura Leach)
- 11:00 **Courtney Elder, Rachel Bowles, Fred Siewers, and Aaron Celestian** A Textural and Geochemical Study of Lacustrine Ostracodes from San Salvador Island, Bahamas: Evidence of Changing Lake-Water Salinity over Time (Dr. Fred Siewers)
- 11:15 **Ryan McPeak, Jason Selby, and Theo Heeke** General Motors Fascia Drilling Project (Dr. Kevin Schmaltz)
- 11:30 **Amar Patel\*, Jenna Binion, Aaron McKee\*, Hemali Rathnayake, and Vladimir Dobrokhotov** Poly(3-hexyl thiophene) and Perylenediimide Functionalized Siloxane and Bridged-Siloxane Nanoparticles (Dr. Vladimir Dobrokhotov)

## Undergraduate Paper Session 12: Natural Sciences

Room: GRH 2010

Judges: Dr. Khaldoun Almously (moderator) and Mr. Clinton Copp

- 10:15 **Jacob Wimsatt** WKU Architectural Facility (Prof. Laura Leach)
- 10:30 **Amanda Huff\***, **Whitney Tyree**, and **Christine Gries** A.R.T.E.M.I.S Double Prime (Dr. Kevin Schmaltz)
- 10:45 **Andrew Gott** Determining Star Formation Rates of Supernovae Host Galaxies (Dr. Louis Strolger)
- 11:00 **Kyle Spurgeon** Louisville Metro Fire Station Dixie Highway (Prof. Laura Leach)
- 11:15 **Victoria Gilkison^**, **Makka Wheeler^**, and **Clarice Esch^** Examination of *Heliconia* Habitat Preference in Cloudbridge Nature Preserve (Dr. Keith Philips)
- 11:30 **Surina**, **Alyssa** Private Education Market in China: Turbo-Charging Economic Growth (Dr. Michelle Trawick)

# PAPER SESSIONS III

## Graduate Paper Session 8: Humanities

Room: GRH 1002

Judges: Dr. Mary Wolinski (moderator) and Dr. Ted Hovet

- 1:45 **Amber Slaven** You Think It, I Ink It: The Tattoos of Tim Phelps (Dr. Timothy Evans)
- 2:00 **Kevin Dorth** An Evaluation of the Significance of the Battle of Tours/Poiters in AD 732 (Dr. Rick Keyser)
- 2:15 **Kyle Sanders** Bosom Buddies: How Edgar Allan Poe and Roger Corman Became a Match Made in Heavenly Hell (Dr. Sandra Hughes)
- 2:30 **James Miller** Men in the Kitchen (Dr. Michael Ann Williams)
- 2:45 Break
- 3:00 **Kristin Eller** Perverse Grotesqueries: Inverting the Black/White Binary in Poe and Oates (Dr. Sandra Hughes)
- 3:15 **Derek Coulson** The Disciples of Christ and Their Interpretive Transition (Prof. Tamara Van Dyken)
- 3:30 **Martin Broadwell** Ultra-Talk Poetry: A Definition in Performance (Dr. Tom Hunley)
- 3:45 **Molly Bolick** Examining the Lives of Working Women College Students (Dr. Ann Ferrell)

### Undergraduate Paper Session 13: Humanities

Room: GRH 1003

Judges: Dr. Deborah Logan (moderator) and Dr. Paula Quinn

- 1:45 **Ellen Hatler\*** Can't Even Shout, Can't Even Cry: Communication and Community in *Buffy the Vampire Slayer's* "Hush" (Dr. Ted Hovet)
- 2:00 **Tracy Scherzer\*, McKenna Byerley, Anna Agisilaou, Emily Heeb, and Sarah Franklin** Helping Those Who Are Dedicated to Helping Others: A Campaign for the IRHDR (Prof. Kenneth Payne)
- 2:15 **Kasey Vaught** The Moral Lapses of Men: Justice Defined by *Watchmen* (Dr. Sandra Hughes)
- 2:30 **Katrina Bidwell\*** Charting the Unknown: An Unlikely Playwright (Dr. Scott Stroot)
- 2:45 **Nicholas Asher** Axemanship (Dr. Dale Rigby)
- 3:00 **Colleen Stewart\*** Reporting on Women in Sustainable Agriculture (Prof. Mac McKerral)
- 3:15 **Traci Simms** How *Slaughterhouse-Five* is an Anti-War Novel, or Why a Pillar of Salt Wrote a Novel about the Fire-Bombing of Dresden (Dr. Ted Hovet)

### Undergraduate Paper Session 14: Humanities

Room: GRH 1089

Judges: Prof. Terri Baker (moderator) and Dr. Michael Seidler

- 1:45 **Brittany Cheak\*** Women of the Ramayana (Dr. Deborah Logan)
- 2:00 **Laurel Wilson\*** Changes in Newspaper Portrayal of Women, 1900-1960 (Dr. Paula Quinn)
- 2:15 **Stefan Meadows** Sounds of a Deteriorating Mind: The Use of Sound in *Narton Fink* (Dr. Ted Hovet)
- 2:30 **Leigh Gaskin, James Miller, and Nikki Byrd** Gales Point Cemetery Restoration (Dr. Molly Kerby)
- 2:45 **Thomas Cherry** W.H. Auden's *September 1, 1939*: A Progression Toward the Collective Spirit (Dr. Elizabeth Weston)
- 3:00 **Adrianna Silver** Ambiguity in the Truth of Art: Heidegger's *The Origin of the Work of Art* (Dr. Adrian Switzer)
- 3:15 **Meagan Harris\*** Solitary Souls: Transcendence through Death in Chopin and Whitman (Dr. Ted Hovet)



# POSTER SESSIONS

## Graduate Poster Session 1: Natural Sciences

Room: GRH 2003

Judges: Dr. Carl Dick (moderator) and Dr. Ajay Srivastava

- G01 **Christopher Ferguson** Effects of Cultivars and Selected Environments on Tomato Production at Bowling Green, Kentucky (Dr. Elmer Gray)
- G02 **Shrikant Pawar** Statistical Analysis of Microarray Gene Expression Data from a Mouse Model of Toxoplasmosis (Dr. Claire Rinehart)
- G03 **Raj Kishore Vakiti, Christopher Carmichael, Camille Turner<sup>^</sup>, Yan Cao, Hou-Yin Zhao, Wei-Ping Pan, and Bangbo Yan** Metal-Organic Frameworks with High Carbon Dioxide Adsorption Capacity (Dr. Bangbo Yan)
- G04 **Mitchell Gaines, Ronnie Leeper, and Rezaul Mahmood** An Analysis of WRF Physics Parameters for the January 29-30, 2008 Ohio Valley Squall Line Event (Dr. Rezaul Mahmood)
- G05 **Sean Hutchison** Influence of Decadal Climate Variability on Vegetation in Mammoth Cave National Park (Dr. John All)

## Graduate Poster Session 2: Social Sciences

Room: GRH 2005

Judges: Prof. Amy Slowik (moderator), Mr. Jae Kim, and Dr. Carrie Pritchard

- G06 **Shradha Vasa, Elizabeth Fedor, Brandon Brugger, YuPing Huang, and James Navalta** The Effect of Three-Day Interval Runs to Exhaustion on Lymphocyte Subset Count, Lymphocyte Apoptosis and Lymphocyte Migration in College-Aged Males (Dr. James Navalta)
- G07 **Lindsey Greco** Gender Differences in the Perceived Costs and Benefits of Work-place Mistreatment (Dr. Tony Paquin)
- G08 **Abby Meador** Minor Incidents with Major Impacts: The Effect of Bottom-Up Incivility on Supervisors (Dr. Tony Paquin)
- G09 **Meghana Gaharwar** Smoking among College Students: A Comparative Study between Smokers and Non-Smokers (Dr. Marilyn Gardner)
- G10 **Alka Bhattarai, Grace Lartey, Shalini Singh, Tina Abrefa-Gyan, and Huma Ansari** Duration of AIDS and Its Influence on Service Use for Serious Mental Illness, Anxiety and Sexual Disorders (Dr. William Mkanta)
- G11 **Christopher Green** Dating Preferences among African-American Female College Students: Attitudes about Appearance, Trust, and Interracial Relationships (Dr. Joan Krenzin)

### **Graduate Poster Session 3: Social Sciences**

**Room: GRH 2005**

**Judges: Prof. Amy Slowik (moderator), Mr. Jae Kim, and Dr. Carrie Pritchard**

- G12 **Sarah Mattingly and Dana Bradley** Kentucky's Policies for Unbridled Aging (Dr. Dana Bradley)
- G13 **Rebecca Wittman, Shelby Stephens<sup>^</sup>, David Stephenson, and Kelly McCoy** Perpetual Motion: Action Over Distraction (Prof. Andrew Mienaltowski)
- G14 **Katie Brown** Development of Negative Attentional Bias during Exercise Measure and the Rumination and Escape Thoughts Measure (Dr. Steven Wininger)
- G15 **Pragati Gole, Darlene Shearer, Diane Sprowl, and Varun Malayala** Fruit and Vegetable Consumption among Immigrant and Non-immigrant Women Served by WIC in South-Central Kentucky: A Needs Assessment (Dr. Christine Nagy)
- G16 **Shailesh Advani and Arul Janarthanam** Assessing Public Health Emergency Preparedness Core Competencies and Training Needs of Local Health Department Staff (Dr. Christine Nagy)

### **Undergraduate Poster Session 1: Humanities**

**Room: GRH 2002**

**Judges: Ms. Trish Jaggars (moderator), Dr. Alison Langdon, and Dr. Cynthia Houston**

- U01 **Bennett Hibbler, Jr.** The Harlem Renaissance (Prof. Matt Tullis)
- U02 **Julie Schuck** Myths of Mortality (Prof. Laurin Notheisen)
- U03 **Austin McBride** Vietnam Era Psychedelic Poster Design (Prof. Matt Tullis)
- U04 **Veronica Newman** Evolution of Video Games (Prof. Matt Tullis)
- U05 **David DeCapio** Modern Sequential Art in the 21<sup>st</sup> Century and Beyond (Prof. Matt Tullis)
- U06 **Wren Burnett** Contemporary Design Collaborations (Prof. Matt Tullis)

### **Undergraduate Poster Session 2: Humanities**

**Room: GRH 2002**

**Judges: Ms. Trish Jaggars (moderator), Dr. Alison Langdon, and Dr. Cynthia Houston**

- U07 **William Davis** Effects of Underground Artists in Contemporary Design (Prof. Matt Tullis)
- U08 **Megan Webb** Textile Design (Prof. Matt Tullis)
- U09 **Adam Diestelkamp** Computer Software Development and Art (Prof. Matt Tullis)
- U10 **Jessica Wurth** Street Artists and Anonymity, or the Lack Thereof (Prof. Matt Tullis)
- U11 **Lauren Conkin** Optical Illusion Artists of the 20<sup>th</sup> Century (Prof. Matt Tullis)
- U12 **Rachael Baumgardner** Art Deco Jewelry (Prof. Matthew Tullis)

### **Undergraduate Poster Session 3: Humanities**

**Room: GRH 2002**

**Judges: Dr. Jane Olmsted (moderator), Prof. Mac McKerral, and Ms. Elizabeth Sholar**

- U13 **Jessica Harp** World War II Propaganda Poster Design (Prof. Matt Tullis)
- U14 **Justin Wuetcher** Typographic Transformation (Prof. Matt Tullis)
- U15 **Amanda Ball** Aubrey Beardsley: 25 Years of Controversy (Prof. Matthew Tullis)
- U16 **Victor Howard** Disney's Legendary Animators (Prof. Matt Tullis)
- U17 **Leslie Hill** Exploring Midcentury Modern Furniture (Prof. Matt Tullis)
- U18 **Chasen Igleheart** Salo (Prof. Yvonne Petkus)

### **Undergraduate Poster Session 4: Natural Sciences**

**Room: GRH 2003**

**Judges: Dr. Carl Dick (moderator) and Dr. Ajay Srivastava**

- U19 **Benadin Varajic\***, **Jon Moore**, **Joshua Sanford\***, and **Cathleen Webb** Effective and Affordable Arsenic Purification Methodology (Dr. Cathleen Webb)
- U20 **Justin Pile\*** and **Nilesh Sharma** Studying the Pathogenesis of Ulcerative Colitis Under the Influence of Plumbagin (Dr. Nilesh Sharma)
- U21 **Helen Thompson**, **Chris Anbresse**, **Eric Vanover**, **Rui Zhang**, and **Yan Huang** A Novel Photosynthesis of Trans-dioxoruthenium(VI) Porphyrins (Dr. Rui Zhang)
- U22 **Sean Shannon\*** and **Ajay Srivastava** Identification of Candidate Basement Membrane Degradors Using *Drosophila* Genetics (Dr. Ajay Srivastava)
- U23 **Nilesh Sahi\***, **Sumit Batra**, **Kristen Mikulcik**, **Heather Shockley**, **Camille Turner<sup>^</sup>**, **Zachary Laux<sup>^</sup>**, and **Vivek Badwaik** Novel Purification Protocol for Heparin Binding Proteins: Relevance in Biopharmaceuticals (Dr. Rajalingam Dakshinamurthy)
- U24 **Kyle Mattingly\*** Analysis of the 3 January 2000 Tornado in Owensboro, Kentucky (Dr. Josh Durkee)

### **Undergraduate Poster Session 5: Natural Sciences**

**Room: GRH 2006**

**Judges: Dr. Keith Philips (moderator) and Prof. Eve Main**

- U25 **Samantha Hawtrey<sup>^</sup>**, **Rodney King**, and **Claire Rinehart** The Isolation and Characterization of Luke117, a Novel Mycobacteriophage Isolated from Union, Kentucky (Dr. Rodney King)
- U26 **Wesley Peden\*** Forks, Skewers, and Pins: Using Chess to Analyze "Sticky" Situations (Dr. Wieb Vandermeer)
- U27 **Charles Coomer\***, **Claire Rinehart**, and **Rodney King** A Novel Bacterial Virus Isolated from Middletown, Kentucky (Dr. Rodney King)

- U28 **Owen Gaulle\***, **Louis Strolger**, and **Barbara Still**<sup>^</sup> Evaluating the Lyrid Stream from a High Altitude Balloon Experiment (Dr. Louis Strolger)
- U29 **Lori Lovell**<sup>^</sup>, **Rodney King**, and **Claire Rinehart** Isolation of Novus, a Novel Bacteriophage Isolated from Florence, Kentucky (Dr. Rodney King)
- U30 **Christopher Carmichael** Metalloporphyrins (Dr. Bangbo Yan)

### **Undergraduate Poster Session 6: Natural Sciences**

**Room: GRH 2006**

**Judges: Dr. Keith Philips (moderator) and Prof. Eve Main**

- U31 **Shawn Smiley**, **Claire Rinehart**, and **James Forshee** Determining the Locations of Mycobacteriophage Promoter Sites Using a Data Filtering Program (Dr. Claire Rinehart)
- U32 **Celia Whelan**<sup>^</sup> and **Kevin Williams** Reaction Rates of Amino Acids with Analogs of the Anticancer Drug Cisplatin (Dr. Kevin Williams)
- U33 **Barbara Still**<sup>^</sup> Atmospheric Reflection (Dr. Louis Strolger)
- U34 **Viktoria Nelin**<sup>\*</sup> The Proliferation of Vascular Smooth Muscle Cells Depends on Thioredoxin 1 Protein in a Model of Pulmonary Hypertension (Dr. Nancy Rice)
- U35 **Nicholas Zolman**<sup>^</sup> and **Lydia Brothers**<sup>^</sup> A Light in the Darkness: Finding Type Ia Supernovae in the CANDELS Hubble Space Telescope Survey (Dr. Louis Strolger)
- U36 **Virginia Martin**<sup>\*</sup> and **Amy Poynter**<sup>\*</sup> Synthesis and Characterization of Analogs of the Anticancer Drug Oxaliplatin (Dr. Kevin Williams)
- U37 **Cameron Mason** The Hideaway Restaurant and Spa, Lake Malone State Park, Dunmor, Kentucky (Prof. Laura Leach)

### **Undergraduate Poster Session 7: Natural Sciences**

**Room: GRH 2008**

**Judges: Prof. Matt Dettman (moderator) and Dr. Mark Doggett**

- U38 **Jack Ferguson**<sup>^</sup>, **Christopher Simouth**, **Andrew Edge**, and **Jenna Binion** Fluorescein and FITC Derivatives Functionalized Silsesquioxane/Bridged Silsesquioxane Nanoparticles: Synthesis, Characterization, and Particle Morphology (Dr. Hemali Rathnayake)
- U39 **Shelby Rader**<sup>\*</sup> Synthesized Crystalline Materials and Ion Exchange (Dr. Aaron Celestian)
- U40 **Hannalore Clause**<sup>^</sup> Computational Characterization of Bonding in Diatomic Molecules: Electronic Structure and Electronegativity (Dr. Jeremy Maddox)
- U41 **Jason Leszczewicz** Portable Ultra High Vacuum Analysis Systems (Dr. Alexander Barzilov)

- U42 **Chad Willis\***, **Lakshmisri Vangala**, and **Vivek Badwaik** Synthesis of Glycan-Based Biocompatible Nanoparticles and Its Anti-Bacterial Activity (Dr. Rajalingam Dakshinamurthy)
- U43 **Gutierrez, Alex^**, **Rodney King**, and **Claire Rinehart** Genome Discovery and Exploration (Dr. Rodney King)

### **Undergraduate Poster Session 8: Natural Sciences**

**Room: GRH 2008**

**Judges: Prof. Matt Dettman (moderator) and Dr. Mark Doggett**

- U44 **Anthony Gutierrez^**, **Rodney King**, and **Claire Rinehart** The Journey of a Bacteriophage, Pestilence (Dr. Rodney King)
- U45 **Camille Turner^** and **Christopher Carmichael** Synthesis and Characterization of MOF-5 (Dr. Bangbo Yan)
- U46 **Michael Powers** Ion Selectivity Studies on the Mineral Cavansite (Dr. Aaron Celestian)
- U47 **Tejas Sangoi^** and **Lakshmisri Vangala** Green Synthesis and Characterization of Metallic Nanoparticles using Starch from Potato (Dr. Rajalingam Dakshinamurthy)
- U48 **John Wilson\*** and **Keith Andrew** Predictability Time of an Einstein Klein-Gordon Cosmology (Dr. Keith Andrew)
- U49 **Joshua Jackson^** A Survey of the Biodiversity of Dung Beetles in the Nimba Mountain Range, Guinea, West Africa and Surrounding Area (Dr. Keith Philips)
- U50 **Andrea Eastes^**, **Rodney King**, and **Claire Rinehart** Isolation of the Bacteriophage Liberi (Dr. Rodney King)

### **Undergraduate Poster Session 9: Social Sciences**

**Room: GRH 2010**

**Judges: Prof. Roxanne Spencer (moderator), Dr. Kate King, and Ms. Tina Peterson**

- U51 **Claci Ayers^**, **Kaleigh Vance**, **Mary Greenwell\***, **Mallory Rogers**, **Christy Culbreth\***, **Normanda Brannock**, and **Sara Simmons** Social Construction of Social Skills in Children with Autism (Dr. Carrie Pritchard)
- U52 **Anthony Cooper\***, **Kelly McCoy**, **Paul Fleischmann^**, **Shelby Stephens^**, and **Rebecca Wittman** Lean on Me: Freshmen Seek Support while Adjusting to College (Prof. Andrew Mienaltowski)
- U53 **Kaitlin Vonderschmitt\*** and **Jennifer Thomas\*** Interpretation of First Amendment Rights in Honors and Non-Honors College Students (Dr. Scott Lasley)
- U54 **David Stephenson**, **Anthony Cooper\***, **Paul Fleischmann^**, **Shelby Stephens^**, and **Rebecca Wittman** Men Let It Go, Women Talk It Out: Gender Differences in Coping with Stress (Prof. Andrew Mienaltowski)



- U55 **Kathryn Carpenter, Chloe Harper, and Lisa Duffin** SKy Teach vs. the Traditional Teacher Education Program: Why Is the Quality of Learning of Educational Psychology Content Different? (Dr. Lisa Duffin)
- U56 **Rachel Neuner and Jeffrey Barefoot** Comparing the Acoustical Characteristics of a Multipurpose Room Utilized as a Classroom to Recommended Guidelines (Prof. Jeffrey Barefoot)

### **Undergraduate Poster Session 10: Social Sciences**

**Room: GRH 2010**

**Judges: Prof. Roxanne Spencer (moderator), Dr. Kate King, and Ms. Tina Peterson**

- U57 **Curtlyn Kramer, Adam Frost, Lance Hahn, and Pitt Derryberry** The Effect of Sexual Context on Moral Decision Making in Men and Women (Dr. Lance Hahn)
- U58 **Austin Roberts** Emergency Medical Response Units: A New Era in Disaster Relief (Prof. Travis Wilson)
- U59 **Tiffany Miller, Courtney Keen, Cecily Carson, Shannon Minor, Charlie Richard-son, and Krisstal Clayton** Consistency and Agreement Rates in Clinical Diagnoses (Ms. Krisstal Clayton)
- U60 **Alexandria Boswell\*** Depravity and Insincerity Get Noticed (Prof. Andrew Mienaltowski)
- U61 **Myles Oliverio** Tooley Cemetery of Monroe County, Kentucky (Dr. Darlene Apple-gate)
- U62 **Rachel Weinzapfel\*** The Effects of Music on the Social Behavior of a Child with Autism Spectrum Disorder (Prof. Mary Lloyd Moore)
- U63 **Josh Moncrief and Daniel Moore** Doubt<sup>2</sup> = Confidence (Dr. Aaron Wichman)

## **ABSTRACTS**

**Abrefa-Gyan, Tina** See Bhattarai, Alka (page 19) and Chavan, Prachi (page 9)

**Advani, Shailesh and Arul Janarthanam** Assessing Public Health Emergency Preparedness Core Competencies and Training Needs of Local Health Department Staff (Dr. Christine Nagy) Disaster preparedness training is an important component of public health workforce development in all local health departments. The purpose of this project was twofold: 1. To assess public health emergency preparedness core competencies and training needs of all staff working at eight local health departments in south-central Kentucky. 2. To make recommendations and suggestions for changes in disaster preparedness training methods and develop educational materials. This study utilized an online survey to assess the health department's staff on knowledge of disaster preparedness. In addition, the employees rated themselves on general and role-specific emergency preparedness competencies, and provided insight into factors that would promote or prevent them from attending training sessions. (page 20)

**Advani, Shailesh** See Singh, Shalini (page 13)

**Agisilaou, Anna** See Scherzer, Tracy (page 18)

**Allen, Andrew** See Patel, Khushbu (page 11)

**Allen, Celena** See Price, Daniel (page 16)

**Almusharrf, Amara and Ferhan Atici** An Application of Fractional Calculus for Parameter Estimations of One Compartmental Model (Dr. Ferhan Atici) In this talk I introduce fractional calculus and describe the history of the discipline. Then I give the relationships between the Mittag-Leffler function and fractional trigonometric functions. Finally, I present an application of fractional calculus for parameter estimations of one compartmental model of drug concentration in blood. (page 9)

**Anbresse, Chris** See Thompson, Helen (page 21)

**Ansari, Huma** See Bhattarai, Alka (page 19) and Chavan, Prachi (page 9)

**Asher, Nicholas** Axemanship (Dr. Dale Rigby) In *The History of Woodworking Tools*, W. L. Goodman says that the study of tools must begin with the ax because “it was not only the first, but for many years about the only woodworking tool of any kind.” The ax symbolizes its user’s connection to the land – different regions of the country don different ax heads and handles. Though the ax stands at the beginning of civilization, many Americans do not understand its use. This piece of creative nonfiction explores humanity’s connection with the ax through my own personal experience with axes. As a Kentuckian, I have often been placed between two extremes – North and South, rural and urban, sweet and non-sweet tea – and this juxtaposition has shaped not only my view of myself, but my view of rural, southern culture. (page 18)

**Ayers, Claci<sup>^</sup>, Kaleigh Vance, Mary Greenwell\*, Mallory Rogers, Christy Culbreth\*, Normanda Brannock, and Sara Simmons** Social Construction of Social Skills in Children with Autism (Dr. Carrie Pritchard) This design experiment investigated social behaviors during a five-session social skills group. Participants included six 10-year old boys with High Functioning Autism/Asperger syndrome assigned to two groups. Groups differed by type of adult training provided. The social constructivist group received scaffolding while the control group was directly instructed. Average frequencies in Weeks 2-5 were compared to Week 1 (baseline). At baseline, the direct instruction group demonstrated more socially skilled behaviors than did the SC group. Over Weeks 2-5, the SC group showed more improvement than did the control group in gazing at peers while speaking ( $\bar{t}_2(1) = 31.707, p < .0001$ ), looking at no one while talking, and in the use of social skills (Fisher's Exact Test,  $p = .0510$ ). (page 23)

**Badwaik, Vivek, Lakshmisri Vangala, and Rajalingam Dakshinamurthy** Molecular Level Interaction of the Human Acidic Fibroblast Growth Factor with the Angiogenic Drug Capped Gold Nanoparticles (Dr. Rajalingam Dakshinamurthy) Heparin binding proteins mediates a wide range of important cellular processes which makes this class of protein biomedically very important. Fibroblast growth factor 1 (FGF-1) and its receptor (FGFR) are best-characterized members of the heparin binding proteins. Generally, FGFs are known for their strong affinity towards the glycosaminoglycan heparin, as a prerequisite for recognition of a specific tyrosine kinase on the cell surface and are responsible for the cell signal transduction cascade, which leads to its biological activity. In the present study, for the first time we studied the interaction of heparin capped gold nanoparticles (Hep-GNPs) on the FGF-1 and its receptor. Results of the present study will be useful in the development of nanomaterial based pharmacological agents for the treatment of various diseases. (page 14)

**Badwaik, Vivek** See Sahi, Nilesh (page 21) and Vangala, Lakshmisri (page 9) and Willis, Chad (page 23)

**Bailey, Mark** The Coney Island Mall (Prof. Laura Leach) Coney Island, an amusement park in Cincinnati, Ohio, has helped set the standard in family entertainment since the park opened in 1886. A midway named “The Mall” was once the heartbeat of the park, housing rides, games, and food stands. This architectural research project revitalized this vacancy of the park with designs of a multifunctional building and log flume ride appropriately named the Coney Island Mall. To create this structure, extensive research on floodplain construction and sustainable materials was performed. Research and typology studies on museums, gift shops, food courts, theatres, rides, and office spaces also was conducted. The park operations team will be utilizing elements of research and design from this project. (page 16)

**Ball, Amanda** Aubrey Beardsley: 25 Years of Controversy (Prof. Matthew Tullis) My goal as a graphic design artist working on my student research project is to introduce the range an artist can accomplish with his/her graphic work. Impressed by his beautiful and sometimes alarming imagery, I chose Aubrey Beardsley, a controversial artist, illustrator and author. His short but productive and contentious life was aligned with Art Nouveau and the Aestheticism movement in England. His illustrations, his contributions to different publications, and his graphic commercial work are the topic points of my collages. My three graphic collaged posters highlight Aubrey Beardsley’s works, and my essay gives insight into each of the posters’ purposes. (page 21)

**Batra, Sumit** See Sahi, Nilesh (page 21)

**Baumgardner, Rachael** Art Deco Jewelry (Prof. Matthew Tullis) Through my student research project I intend to focus on three jewelers from the Art Deco period. My paper and collages will demonstrate the change that occurred during the Art Deco movement and how artists of the time were influenced by architecture, machinery, and cubism

within many of their designs. Art deco began in France but quickly spread across the world. Artists such as Jean Dunand, Raymond Templier, and Jean Despres are among those who are responsible for this beautiful and wearable movement. These artists took risks with their designs and with the materials they used. Starting with the Art Deco period we began to see many new metals and stones introduced to the jewelry world that had not been used before and are still being used to this day. (page 20)

**Baxley, Jacob** Detection and Identification of Unknown Materials Using Neutron-Gamma Spectroscopy (Dr. Ivan Novikov) Neutron gamma spectroscopy is a non-destructive method used to analyze the chemical composition of unknown substances. A neutron interrogation system to detect and identify materials is under development at the WKU Applied Physics Institute. Neutrons emitted from the source interact with nuclei inside the interrogated container and excite them. Excited nuclei emit  $\gamma$ -rays with energies specific to chemical elements. The proposed system detects these  $\gamma$ -rays and makes decisions on possible chemical composition. A special algorithm was developed to simulate experimental spectra from various substances and to analyze them. Based on obtained results the decision-making algorithm was developed and implemented. (page 12)

**Beers, Amanda\* and Farley Norman** The Transition from 3-D to 2-D Visual Stimuli in Gifted Education and Its Effect on Paired-Associate Learning (Dr. Farley Norman) A single experiment investigated the influence of varying dimensions of visual stimuli on the ability of academically gifted adolescents to recall paired-associations. Fifty-two participants were randomly assigned to one of four groups. Each group was asked to memorize the same set of 15 paired-word associations. The first group was presented with words only. The second group was presented with words and 2-dimensional (2-D) representations of each word. The third group was presented with words along with 3-dimensional (3-D) representations of the words. The fourth group was also presented words along with 3-D objects; however, this group was instructed to actively manipulate the objects. The recall accuracies of each group were measured directly after the presentation of the last word pair in the set. Large within-group variation prevented significant differences between the accuracy of the groups, indicating that individual learning preferences were a strong factor. (page 15)

**Belt, Kirsten\*** International Business Ethics: Models and Cases in Global Commerce (Dr. Ian Lee) Factors of international business are continually fluctuating. The demand for a universal business code of conduct specializing in ethics is overwhelming. Three case studies involving Chiquita Inc., Mattel, and Nike display the dire consequences of poor ethical conduct in today's world. Ethics have grown progressively imperative to international business through increased global commerce, newly applied legislation, and creation of world organizations and agreements. Without a global ethical code, the business environment will be too risky and diversified to progress. The solution is, therefore, implementation of a globally accepted ethical business code that initiates with altering the multinational enterprise structure. This code would best be enforced by the World Trade Organization. The three case studies highlight successful adoption of ethical codes and admired ethical conduct. (page 11)

**Berry, Alex** See Morrison, Travis (page 12)

**Berry, Kyle, Dustin Jordan, Lee Campbell, Gregory Goodrich, Josh Durkee, Stuart Foster, and Rezaul Mahmood** Impact Analysis of the May 2010 Mid-South Flood (Dr. Josh Durkee) On May 1 and 2, 2010 the Mid-South region of the U.S., including portions of Tennessee and Kentucky, experienced an extreme rainfall event. This region received record rainfall amounts within a 48-hour period that surpassed existing monthly rainfall records. This 1000-year event caused over \$2 billion in private property damage with over 11,000 parcels of land affected. More importantly, 26 fatalities were reported with this flood, with the majority reported from Tennessee. This single rain event broke Nashville Tennessee's all-time rainfall record for the month of May. Nashville also recorded its wettest 24-hour rainfall record of 7.21 inches. More noteworthy, a Community Collaborative Rain, Hail and Snow Network rain gauge reported 19.41 inches in Camden, Tennessee for the event. Aside from the 1000-year precipitation event, previous climatic conditions of sustained drought intensified runoff, causing creeks, streams and rivers to swell beyond capacity. (page 12)

**Berry, Kyle** See Campbell, Lee (page 12)

**Bewley, Drew, Douglas Harper, Bruce Hill, Landon Solomon, Mariano Ruiz, and Louis Santodonato** Sample Environment at the Spallation Neutron Source: An Automated Sample Environment Air Purge System (Dr. Douglas Harper) The Automated Air Purge project provides a system designed to automatically control the delivery of air to protect a sample for experiments to be carried out using the Extended Q-Range Small Angle Neutron Scatter Diffractometer (EQ-SANS, Beamline 6) at the Spallation Neutron Source (SNS) located at Oak Ridge National Laboratory (ORNL). The system monitors and maintains the flow of air over the sample during an experiment and while changing samples. During operation the hardware will be isolated and located near the instrument; however, remote control and monitoring for the user has been provided over the local area network via Ethernet. This presentation will focus on the development of the software and user interface, which was designed and programmed at Western Kentucky University. (page 12)

**Bewley, Drew** See Sowell, Dewayne (page 12)

**Bhattarai, Alka, Grace Lartey, Shalini Singh, Tina Abrefa-Gyan, and Huma Ansari** Duration of AIDS and Its Influence on Service Use for Serious Mental Illness, Anxiety and Sexual Disorders (Dr. William Mkanta) Mental health has been a concern among HIV-infected individuals, and the extent of length of survival after an AIDS diagnosis may influence service use for mental disorders. Length of survival after AIDS was investigated with its influence on outpatient services for SMI as well as anxiety and sexual disorders. The study involved male veterans using ICD, to predict the number of outpatient visits associated with disorders. Incident rate ratios were used to assess relative change in the number of visits. Overall, 36% of 3,597 participants had outpatient mental health visits. Duration of AIDS had no impact on service use for SMI; however, it had a significant positive association with visits for anxiety and sexual disorders. Lower CD4 cell count and mortality were associated with increased service use for anxiety and sexual disorders, while being an IDU, MSM and having AIDS were predictors for SMI. Duration of AIDS may pose additional challenges in HIV care due to mental health service needs. (page 19)

**Bickett, William<sup>^</sup> and Phillip Womble** Gamma-ray Spectra in Neutron-Based Explosives Detection Systems (Dr. Phillip Womble) In the method we are studying, a substance is bombarded with neutrons that in turn react with the nuclei of the atoms within, causing a de-excitation process emitting a variety of gamma-rays. Most of the substances involved in explosives detection emit gamma rays that we suspect are Doppler-broadened (i.e., distorted by the Doppler effect). Our research focuses on the gamma ray spectra from the 6129 keV and the 7116 keV gamma rays from  $^{16}\text{O}$ . In our experiment a water sample was exposed to 14MeV neutrons and the  $^{16}\text{O}$  gamma ray spectra collect using a HPGe Detector positioned at eight different angles with respect to the neutron beam. We will discuss the causes of Doppler broadening and our efforts to prove that Doppler broadening occurs in light nuclei. (page 12)

**Bidwell, Katrina<sup>\*</sup>** Charting the Unknown: An Unlikely Playwright (Dr. Scott Stroot) There is no way you have made it through college, or probably high school for that matter, without writing at least one paper. But a play? There it gets complicated. As a double major in Biology and Spanish and a Theatre minor, making the decision to write a play as my Honor's College thesis plunged me into a world that, to me, was largely unknown. The focus of this presentation is to discuss the artistic process of writing a play, drawing heavily upon my experiences while writing my thesis for WKU's Honors College. Some topics to be covered will include generating ideas, the drafting process, and character and plot development. (page 18)

**Bitra, Avinash** Exploring the A\* Path Algorithm (Dr. David Erbach) This project illustrates the use of the A\* path-finding algorithm with variable (user-controlled) weights for the tiles of the domain. Such situations arise frequently in the need to construct plausible paths for autonomous agents in computer games. (page 10)

**Binion, Jenna** See Ferguson, Jack (page 22) and Patel, Amar (page 16)

**Blaylock, Ian<sup>\*</sup>** See Price, Daniel (page 16)

**Boateng, Kwabena<sup>\*</sup>** Xenophobia and Football (Dr. Jane Olmsted) Sports evoke passions and tensions that may explode into derisive attacks against opposition players. In the case of English football, the cultural ties and the immense popularity of the sport amplify these passions and tensions. This paper seeks to unveil how a xenophobic slant prevails in English football media as foreign managers and players begin to flock to the isles. It will review commentary made by the English press and players to examine how these anti-foreign feelings are manifested. The primary areas of concern are the conflict created when foreign managers and players introduce different playing styles, and the use of foreigners as scapegoats. This paper will then briefly detail what this xenophobic phenomenon reveals about the English connection to their football team. The paper will not in any way try to delve into the deeper social meanings of the noted behavior, since the factors of xenophobia do not derive from one institution, which would cause the paper to deviate. (page 11)

**Bolick, Molly** Examining the Lives of Working Women College Students (Dr. Ann Ferrell) In my ethnographic study of working women college students at WKU, I explore how identity is negotiated and maintained in the balancing of work, school and personal life. As an occupational study, I argue that the work of female college students do not fit occupational folklore theorists' qualifications of a "worker." However, when approached from a feminist perspective, their work proves to not only fit such definitions, but goes beyond them in portraying work as one constituent of a complex, multilayered whole through which identity is actively constructed and continuously maintained. (page 17)

**Bolster, Carl** See Vanderhoff, Sean (page 10)

**Boswell, Alexandria<sup>\*</sup>** Depravity and Insincerity Get Noticed (Prof. Andrew Mienaltowski) The purpose of this study is to investigate the effects of emotion on memory of faces and deeds. If a person is committing a smaller crime such as stealing some candy, does the emotion of the person aid in memory of his/her face? The answer to this question may help us learn more about how to improve eyewitness memory and allow us to study what we remember about people while they are doing certain deeds. I believe that people will be able to remember faces of people who are expressing

an unusual emotion to the deed or misdeed. For example, if the person has done a misdeed and looks happy about it, the participant will remember him/her more easily than someone who was not happy about a deed. Further analysis of the data may show a different outcome, and further experimentation will help us determine the causes of enhanced or impaired memory. (page 24)

**Bowles, Rachel** See Elder, Courtney (page 16)

**Bowman, Brandon\*** An Overview of Interdisciplinary Education and Its Utility in Public Relations Education (Prof. Ken Payne) Major debate still persists among scholars regarding the efficacy of interdisciplinary education. The researcher first presents the four methodologies of interdisciplinarity. In a public relations curriculum, full implementation of one method may benefit students, whether they become future practitioners or scholars. Case studies (in other fields and in general education) of successful and failed interdisciplinary models provide an avenue for deeper understanding and compelling arguments for interdisciplinarity in public relations curriculum. Reviewing the philosophy of public relations itself in light of the proposed model provides direct evidence for the necessity of interdisciplinarity. Educators, especially those in related fields, may be able to extend this approach into their personal classrooms and into the broader curricula. (page 11)

**Bracken, Matt** See Steele, Chris (page 15)

**Brannock, Normanda** See Ayers, Claci (page 23)

**Broadwell, Martin** Ultra-Talk Poetry: A Definition in Performance (Dr. Tom Hunley) Since approximately 2002, a new and unusual form of poetry has been gaining prominence. Defined by Mark Halliday as "Ultra-Talk" Poetry, this chatty, loquacious, often low-intensity poetry embraces opposites and considers any subject, exploring all the connections those ideas invoke. I intend to define Ultra-Talk Poetry by offering brief definitions from critical literature by the Ultra-Talk poets and by reciting examples of published Ultra-Talk Poetry from well-known authors and unknown, including my own published pieces. This definition will take the form of a one-man multimedia performance incorporating pictures of the poets and their works (including David Kirby, Josh Bell, and Mark Halliday, among others), dramatic readings of their work, and a brief synopsis of the literary tenets underlying such an unusual poetic form. (page 17)

**Brothers, Lydia^** See Zolman, Nicholas (page 22)

**Brown, Katie** Development of the Negative Attentional Bias during Exercise Measure and the Rumination and Escape Thoughts Measure (Dr. Steven Winger) The main purpose of this study was to develop a measure to assess negative attentional bias toward changes in bodily sensations during exercise and to examine the reliability and validity of that measure. A secondary purpose was to develop a measure to assess tendencies toward rumination about the changes in bodily sensations and tendencies to have escape thoughts with regard to the exercise bout. Participants in this study consisted of 329 undergraduate students with a mean age of 19.94 years. Participants were given two new measures, as well as established measures, of neuroticism, pessimism, trait anxiety, and current exercise habits. The two new measures yielded reliable scores via examination of internal consistency. The results also demonstrated that the new context-specific measures correlated significantly with global measures of neuroticism, pessimism, and trait anxiety. Last, the new measures correlated more strongly with current exercise habits than the global measures. (page 20)

**Brown, Katie** See Perkins, Scott (page 13)

**Brugger, Brandon** See Vasa, Shradha (page 19)

**Buchanan, Steve** See Wilson, Jenna (page 15)

**Burnett, Wren** Contemporary Design Collaborations (Prof. Matt Tullis) The objective of my student research project is to create effective visual communication that centers on the overall theme of graphic design companies. The resulting written report and digital collages are based on the following select three collaborations: Non-Format, BurkhardtHauke, and Adam+Company. Individually, these posters stand alone, showing off a collage of some of their most well-known and momentous works. However, when placed together, the three unite to demonstrate a vast array of design types that I find not only to be the most absorbing, but also the most inspiring. (page 20)

**Byrd, Nikki** See Gaskin, Leigh (page 18)

**Campbell, Lee, Kyle Berry, Dustin Jordan, Josh Durkee, Greg Goodrich, Rezaul Mahmood, and Stuart Foster** Synoptic Analysis of Mid-South Flood Event of May 2010 (Dr. Josh Durkee) On May 1-2, 2010 the Mid-South region of the U.S., encompassing portions of Tennessee and Kentucky, experienced an extreme rainfall event. This region received record rainfall amounts within a 48-hour period that surpassed existing monthly rainfall records. This 1000-year event caused over \$2 billion in private property damage with over 11,000 parcels of land affected. Moreover, 31

fatalities were reported with this flood. The atmospheric conditions, coupled with teleconnections such as the negative phase of the North Atlantic Oscillation, were conducive to optimal synoptic scale setup for a flooding event. A short amplitude longwave trough covered the western U.S. while ridging took place in the east. Further lift was aided by a jet impulse that subsequently moved through the flow. The meridional flow led to slow eastward progression of surface systems, causing an occluded low pressure maximum over the north-central U.S. to become quasi-stationary. (page 12)

**Campbell, Lee** See Berry, Kyle (page 12)

**Carmichael, Christopher** Metalloporphyrins (Dr. Bangbo Yan) This poster looks at metalloporphyrins and polyoxo-metalates and their photocatalytic characteristics. (page 22)

**Carmichael, Christopher** See Li, Yan Fen (page 10); Turner, Camille (page 23); and Vakiti, Raj Kishore (page 19)

**Carpenter, Kathryn, Chloe Harper, and Lisa Duffin** SKy Teach vs. the Traditional Teacher Education Program: Why Is the Quality of Learning of Educational Psychology Content Different? (Dr. Lisa Duffin) The purpose of this study was to examine the depth of conceptual understanding constructed by pre-service teachers enrolled in one of two teacher education programs (SKy Teach and traditional) at WKU. As part of both teacher education programs, pre-service teachers are required to take an educational psychology course (PSY 310 or SMED 210). To make valid comparisons, the data utilized in this study had to be standardized across the two programs. Therefore, data were collected only from pre-service teachers enrolled in Dr. Lisa Duffin's sections of PSY 310 and SMED 210 from fall 2009 to fall 2010. In both courses, Dr. Duffin kept the content, structure, and expectations as similar as possible under the given conditions of the two teacher education programs. Pre-service teachers in both groups were required to complete the same capstone teaching project, where they were to apply the research and theory learned in the courses. (page 24)

**Carson, Cecily** See Miller, Tiffany (page 24)

**Caudill, Martha** See Price, Daniel (page 16)

**Chavan, Prachi, William Mkanta, Tina Abrefa-Gyan, Shalini Singh, and Huma Ansari** Racial Differences in Diagnosis Among HIV/AIDS Female Veterans Receiving Care in VA Facilities (Dr. Grace Lartey) Women receiving HIV care in Veterans Affairs facilities represent a very small percentage compared to male veterans, but they constitute an important group for following up HIV care. We examined racial differences in four major diagnoses (AIDS defining illness, mental disorders, respiratory conditions, and digestive conditions) and facility visits made for HIV services received by women registered in the Immunology Case Registry. Cross-sectional analysis of service use data for 313 (73%) black and 118 (27%) white women who used services in 2003 was conducted. Chi-square and t-tests were used to assess differences in major diagnoses reported in HIV/AIDS patients and corresponding number of visits for HIV care. Of the 431 women with HIV, 60 (14%) were diagnosed with AIDS but there were no racial differences in AIDS diagnosis. Patients had a mean age of 44.4 years, while the mean age at AIDS diagnosis was 39.4 years. (page 9)

**Cheak, Brittany\*** Women of the Ramayana (Dr. Deborah Logan) The Ramayana is one of India's most ancient narratives (circa 1500 BCE). It has influenced gender attitudes and roles, and can teach modern readers quite a bit about the role of women in the 21<sup>st</sup> century. Some female characters in the Ramayana are portrayed as evil seductresses; Manthara is a serpent-tongued servant, and Kaikeyi is an easily swayed manipulator who twists the king's affection for her desires. However, the story also includes the ideal woman, Sita, who is submissive to her husband and tries valiantly to remain true to him. My analysis of the characters Manthara, Kaikeyi, and Sita examines the assumption that women are passionate, wicked creatures, inferior to men but in need of control. The suggestion of emulation shows the impossible standards to which ordinary women have been, and continue to be, held. (page 18)

**Cherry, Thomas** W.H. Auden's *September 1, 1939*: A Progression Toward the Collective Spirit (Dr. Elizabeth Weston) W.H. Auden's poem *September 1, 1939* is a poem on the brink of World War II and it responds to this impending war in a very specific, yet very unique way. I contend that the progression of the poem represents a progression within the author and can be used to show a progression in the consciousness of the entire world. Furthermore, the end that it reaches is a hopeful one that can be seen as an ideal response to great trauma or fear. Auden moves from a sense of hopelessness and fear, toward frustration and blaming, to the ultimate end of collective consciousness and oneness of the world. Auden's poem makes clear the thought of the author and provides insight into a specific way for someone living in the pre-war era of 1939 to deal with the fear and anxiety of the times. (page 18)

**Choate, Thomas** Using Thermal Imaging to Evaluate University Campus Structures in Preparation for Weatherization Repair (Prof. Robert Choate) Two campus academic buildings, Grise Hall (GH) and Ivan Wilson Fine

Arts Center (FAC), were identified in preparation for planned weatherization repair. The intent of this study was to provide before and after infrared images of the repairs of these buildings. However, due to repair project delays, only interim results will be shared in the conference presentation. Particular focus on GH is a known issue of exfiltration due to poor air balancing and subsequent loss of significant conditioned air, resulting in high energy costs. On FAC, a “roof over” was performed during summer 2010 due to aesthetic issues with the existing roof and post installation anomalies. This presentation will outline the methods and the plan to use infrared thermography and additional methods, such as differential pressure measurements, to assess the impact of these repairs. (page 14)

**Clause, Hannalore<sup>^</sup>** Computational Characterization of Bonding in Diatomic Molecules: Electronic Structure and Electronegativity (Dr. Jeremy Maddox) In this work, we use computational chemistry methods to characterize the electronic structure of diatomic molecules. We have calculated the lowest energy ground state molecular geometry and the corresponding normal modes of vibration for various diatomic molecules. Analysis of these calculations yielded information about the nature of different chemical bonds, such as dipole moment, the bond length, densities, and vibrational frequency. By comparing these and other quantities for different molecules, we can make quantitative correlations between molecular properties and the electronegativities of the bonded atoms. (page 22)

**Conkin, Lauren** Optical Illusion Artists of the 20<sup>th</sup> Century / Poster Design (Prof. Matt Tullis) The objective of my student research project is to create effective visual communication that centers on the overall theme of Op Art (Optical Illusion). The resulting written report and digital collages will be based on M.C. Escher, Victor Vasarely, and Josef Albers, three Optical Illusion artists of the 20<sup>th</sup> century. Through my three posters I will visually communicate their designs in a photo-collage manner in the style of their work. The posters will display the geometrical construction of their prints and tessellations. (page 20)

**Conn, Marvin, Christopher Driver, and Buddy Price** New Investigations of an Ancient River System: Refining Geologic and Models of Pennsylvanian Paleovalley Fills in Western Kentucky with Implications for the Development of Groundwater and Petroleum Resources (Dr. Michael May) A network of ancient stream channels extends throughout the subsurface and outcrop belt of the Illinois Basin in western Kentucky. These channels cut into rocks of Mississippian age and formed incised valleys during a period of erosion caused by regional tectonic uplift in the basin and low global sea levels approximately 325 million years ago. They were subsequently filled with predominantly sandy and pebbly river-borne sediments when deposition resumed across the region. These sediments, now lithified, form massive escarpments that rim the basin where they are exposed. They also form highly porous groundwater and petroleum reservoirs where buried in the subsurface further into the basin. Burial depths for the basal valley fills are as much as 2,000 feet in the deepest portions of the Illinois Basin in western Kentucky. (page 16)

**Constant, Matthew** One-to-One Laptop Project: Perceptions of Teachers, Parents, and Students (Dr. Marge Maxwell) One-to-one laptop programs are becoming more prevalent across the world in K-12 institutions. School districts are searching for more engaging tools that impact on school success, such as grade achievement, college/career preparation, and/or 21st-century skill preparation and attainment. Additionally, boards of education continuously want some positive indication of the return on their substantial financial investment. This study utilized surveys of three important stakeholder groups (parents, students, and teachers) related to a one-to-one laptop project in a moderately sized rural Midwestern school district. Perceptions about how often laptops were used in the classroom setting and across content areas (Language Arts, Social Studies, Mathematics, and Science) were explored. (page 9)

**Coomer, Charles\*, Claire Rinehart, and Rodney King** A Novel Bacterial Virus Isolated from Middletown, Kentucky (Dr. Rodney King) It is estimated that there are  $10^{31}$  bacteriophages on Earth, but very few have been characterized. The purpose of the WKU Genome Discovery and Exploration project was to gain insight into the diversity of the bacteriophage population by isolating and characterizing new bacteriophages from the environment. Using the common soil microbe *Mycobacterium smegmatis* as a host, we isolated and characterized a bacteriophage from a soil sample collected near a creek in Middletown, Kentucky. The purified phage, named “Woof,” formed clear, circular plaques roughly 2.5 cm in diameter. The genomic DNA from Woof was purified and analyzed by restriction analysis and gel electrophoresis and the characteristics of the phage capsid and tail were determined by electron microscopy. The results of this analysis suggest that Woof is a unique bacteriophage. (page 21)

**Cooper, Anthony\*, Kelly McCoy, Paul Fleischmann<sup>^</sup>, Shelby Stephens<sup>^</sup>, and Rebecca Wittman** Lean on Me: Freshmen Seek Support while Adjusting to College (Prof. Andrew Mienaltowski) Prior research supports the idea that depression can impact the various types of coping strategies that people use when faced with interpersonal problems. We examined this relationship by presenting a sample of first-time college freshmen (n=92) with ten vignettes depicting stressful college-related, life adjustment events. Participants rated how likely they were to use particular coping strategies after completing measures of depression. Results reveal that having more depressive symptoms was associated with less planning and active coping but with more venting and attempts to seek emotional

support. This study implicates social interaction as playing an important role in how depressed individuals cope with stress. (page 23)

**Cooper, Anthony\*** See Stephenson, David (page 23)

**Coulson, Derek** The Disciples of Christ and Their Interpretive Transition (Prof. Tamara Van Dyken) With research based on three major periodicals of the Christian Church (Disciples of Christ), Independent Christian Churches and Churches of Christ, the aim of this paper is to describe and analyze the social means of schism within the Restoration, or Disciples movement. By using the state of Kentucky as the general borders of this study, the interaction of each respective branch will be more clearly seen and understood than has been with previous studies. Each base of the three branches had its respective periodical in close proximity to the state, from which editors of each had deep roots in Kentucky. This paper will expand on the tumultuous religious period of the 1920s, and the Disciples within that context. Emphasis will include the movement's hermeneutical differences that defined several of their issues. Each of these is informed and instigated by the surrounding three bases of Kentucky. (page 17)

**Cui, Yaowen, Yan Cao, and Wei-Pin Pan** The Preparation of Copper-Based Oxygen Carrier Using Coprecipitation Method (Dr. Yan Cao) In the conventional combustion process, carbon dioxide (CO<sub>2</sub>) is diluted by nitrogen from air. Thus, the purification of CO<sub>2</sub> is necessary, which incurs the great energy penalty. Chemical looping combustion is the most cost-effective power generation technology with the CO<sub>2</sub> inherently concentrated. The preparation of an oxygen carrier with high thermal stability, durability, and better kinetics under harsh environment is required. Previous studies indicated the doping methods using the commercial  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> supporting material were successful, but there were questions on its economic feasibility. In this study, the coprecipitation method, starting from raw materials of inexpensive Al<sub>2</sub>O<sub>3</sub>, was applied to preparing the cost-effective oxygen carrier and coating the oxygen carrier on alumina particles in a fluidized bed. (page 14)

**Culbreth, Christy \*** See Ayers, Claci (page 23)

**Cundiff, Gary, Becky Gilfillen, Todd Willian, Annesly Netthisinghe, Roger Dennis, K.L. Cook, and M. LaCorbiniere-Baptiste** Using Arbuscular Mycorrhizae to Influence Yield, Soil Quality and Nutrient Uptake in Conventional vs. Organic Vegetable Production (Dr. Becky Gilfillen) This research is a two-year study on the effects of endomycorrhizae on vegetable production using conventional vs. organic practices. Mycorrhizae have been shown in lab and greenhouse studies to improve plant nutrient uptake especially of nitrogen and phosphorous. In return the plant gives carbon to the arbuscular mycorrhizae. This study is to determine how mycorrhizae improve available plant nutrient uptake from two different production systems. Measurements were taken on yield, vegetative quality, and soil nutrient content. Two plant species were chosen, tomatoes (c.v. *Big Beef*) and bush beans (c.v. *Tenderette*). A two-factor factorial design was used with three different inputs: MO- 0 mycorrhizae, M1- 1x rate, and M2- 2x rate. Each mycorrhizal input was replicated three times in both the conventional and organic systems. Initial results from the first year show that there is no difference in yield based on mycorrhizae additions at any rate. (page 10)

**Damera, Venkata and Shalini Singh** The Financial Performance of the Hospital Systems in the Nashville Health Care Council (Dr. Gregory Ellis-Griffith) Healthcare costs have been rising for past few years. However, reimbursements have not kept up with costs. This environment has led hospital systems to search for efficient and effective ways to deliver care. Nashville has one of the largest health care industries in the United States. The Nashville Health Care Councils (NHCC) was formed to further the growth of the healthcare industry in Nashville area. The council has members from various sectors of the healthcare industry and allows unparalleled networking opportunities. We investigated the companies that comprise NHCC by analyzing various financial and operating indices of the individual members. By looking at these indices, we hope to identify and categorize their financial performance. (page 13)

**Davis, William** Effects of Underground Artists in Contemporary Design (Prof. Matt Tullis) The objective of my student research project is to create effective visual communication that focuses on the impact of underground artists in the world of advertising. I found three such artists in Mark Ward, David Choe, and Geoff McFetridge. Their work ranges from album art and concert posters, to fashion and motion graphics. They have been commissioned by some of America's largest corporations to attract new business. These artists want their work to stand out in a crowd, and that is the reason why so many companies are interested in their designs. They've still done things their way, even when they're "selling out" to "big bad corporate America." (page 20)

**DeCapio, David** Modern Sequential Art in the 21<sup>st</sup> Century and Beyond (Prof. Matt Tullis) Printed sequential media is the perfect marriage of literature and visual art brought together in the form of graphic novels and comic books. Three of the most well-known and respected leaders in the field of comics are not only artists, but also designers. Bringing to life characters that are both captivating to look at and read about. Bob Kane began with Batman in the 1930s, essentially altering Superman's original costume and making the Dark Knight a real person through dramatic storytelling. Stan Lee brought to the table super-heroes who lived their lives much like anyone else, seemingly giving



us characters whose looks were instantly discernable and whose lives were as complex and real as our own. Mike Mignola took one of his greatest desires to bring together a world of fantasy and mythology and gave us Hellboy, an anti-hero/hero characterized as just another one of the guys who saves the world. (page 20)

**Diestelkamp, Adam** Computer Software Development and Art (Prof. Matt Tullis) The objective of this research project is to visually commemorate some of the most widely used tools in art today, computers and software. The three visual pieces and accompanying written report are based on three pioneers in this field, Steve Jobs, Bill Gates, and Linus Torvalds. These three icons have helped create and advance computers and software that have influenced and expanded our world of art. Their developments have given us new ways to create and manipulate our work, opening up an immense realm of possibilities. I will commemorate, through digital collages and a written paper, the effect each of these innovators has had on the development of computer software and art. (page 20)

**Dilger, Daniel**<sup>^</sup> See Smith, Keaton (page 15)

**Dorth, Kevin** An Evaluation of the Significance of the Battle of Tours/Poiters in AD 732 (Dr. Rick Keyser) Many historians consider the Battle of Tours/Poiters in AD 732 as one of the most influential engagements in Western history. However, new research into the details of the battle has downplayed this notion. The argument shifted from one of importance to one of miniscule significance. The objective of this study is to determine not only how important the conflict was, but also to review the reasons the battle has become marginalized. Whether or not the research leads to the conclusion that the clash between the Cross and the Crescent at the Battle of Tours/Poiters was not at all important in preventing Islam from spreading throughout Europe, one can reason that the Frankish victory resulted in the rise of the Carolingian Dynasty, where the father of Europe, Charlemagne, would eventually shape the face of Western Europe. (page 17)

**Downen, Matt**<sup>\*</sup> The Formation History of Multi-Layered Chondrules in Acfer-139 (CR2) (Dr. Andrew Wulff) Chondrules are spherical grains made of silicates and metal that represent some of the oldest materials in our solar system. Acfer-139 (CR) is a chondrite with large multilayered chondrules. Serial sectioning was used to analyze the sample in 3-D. EMPA and LA-ICP-MS were used to create elemental maps and determine the geochemistry of different layers in each thick section. XRCMT was used to construct a 3-D model of a large multi-layered chondrule named Ch-1 with concentric layers of silicate and metal. A core-to-rim analysis of Ch-1 revealed increasing silica and volatile elements existing from the core to rim, as well as a decrease in refractory elements. Analyses of Ch-1 support a formation consisting of silicate and metal layers being accreted onto the core in a protoplanetary disc. (page 15)

**Driver, Christopher** See Conn, Marvin (page 16)

**Duke, Emily, Hayley Travis, and Darlene Applegate** Archaeological Survey of Forestville Saltpeter Cave, Hart County, Kentucky (Dr. Darlene Applegate) Forestville Saltpeter Cave is located in the WKU Upper Green River Biological Preserve in Hart County. The cave reportedly was mined in the early 1800s for saltpeter, which was used to manufacture gunpowder. Speleologists investigated and mapped the cave, but there have been no detailed studies of possible mining activity. In 2009 and 2011 we conducted archaeological research aimed at documenting historic period activities in the cave. Vast areas of dug soils, as well as tally marks and tool marks on the walls, confirm accounts of saltpeter mining, which was quite extensive. We also documented a number of historic signatures on the cave walls. (page 15)

**Eastes, Andrea**<sup>^</sup>, **Rodney King, and Claire Rinehart** Isolation of the Bacteriophage Liberi (Dr. Rodney King) There are approximately  $10^{31}$  bacteriophages in the biosphere, making them the most numerous organisms on the planet, yet only a fraction have been characterized. Using the bacterial host, *Mycobacterium smegmatis*, bacteriophages were recovered from soil collected from Mayfield, Kentucky. Single plaques were picked from plates to insure that the phage was pure. The purified phage was named "Liberi." Genomic DNA from Liberi was isolated and the concentration was determined by spectrophotometry. The purified DNA was analyzed by restriction analysis and gel electrophoresis and the morphology of the phage particle was characterized by electron microscopy. The results of this analysis suggest that Liberi is a unique bacteriophage. (page 23)

**Edge, Andrew** See Ferguson, Jack (page 22)

**Elder, Courtney, Rachel Bowles, Fred Siewers, and Aaron Celestian** A Textural and Geochemical Study of Lacustrine Ostracodes from San Salvador Island, Bahamas: Evidence of Changing Lake-Water Salinity over Time (Dr. Fred Siewers) A 23 cm core was taken of sediments underlying Storrs Lake, a marine hypersaline lake on San Salvador Island, Bahamas. The core was of Holocene age and was characterized by algal mat and sand facies. Ostracodes (bivalved crustaceans) of the species *Cyprideis americana* were extracted from the core in centimeter increments. Textural and geochemical analyses of the ostracodes via reflected light microscopy, backscatter electron microscopy with EDS, and Raman spectroscopy indicated compositional changes among the shells. Mol. % MgCO<sub>3</sub> and Mg/Ca ratios were calculated from the Raman data. Variations in those parameters may reflect lake water salinity

changes over time (Teeter and Quick 1990). A change in the opacity of the ostracode valves low in the core may also mark a sedimentation discontinuity. (page 16)

**Eller, Kristin** Perverse Grotesqueries: Inverting the Black/White Binary in Poe and Oates (Dr. Sandra Hughes) American cultural tradition tends to place issues within a binary structure illustrating the law of irreconcilable opposites: things must be either black or white. One must choose sides, and it is almost automatically assumed white represents good while black represents evil. At what point, though, do we reverse our perceptions? In American Gothic literature, Edgar Allan Poe helped shift the connotations of the black/white symbolic by weaving it into his expressions of the uncanny perverse. The idea of a white wickedness versus benign blackness within the Gothic grotesque is carried further into popular culture when comparing Poe's story, "The Black Cat," with its modern counterpart, "The White Cat," by Joyce Carol Oates. This essay explores how both illustrate the evident inversion in pop culture of traditional black/white binaries. (page 17)

**Esch, Clarice<sup>^</sup>** Is *Collema sp.*, a Gelatinous Lichen, a Sustainable Source of Nitrogen for Greenhouse and Nursery Crop Production? (Dr. Martin Stone) Fixation of atmospheric nitrogen is vital to plant life. Many cyanobacteria fix nitrogen and can associate with fungi to form lichens. The gelatinous lichen *Collema sp.* is a Warren County native that inhabits bare soil. During periods of sufficient soil moisture, it fixes nitrogen, photosynthesizes, and changes in appearance from a dry, hard flake to hydrated, swollen, and jelly-like. When applied to the soil surface of a planted pot, *Collema* can act as a nitrogen fertilizer supplement through the release of the nitrogen fixed by the cyanobacteria symbiont into the soil. Preliminary studies were conducted to examine *Collema's* rate of growth, rate of hydration, and the effect of nitrogen produced on plant growth. The results suggest that *Collema* is a promising specimen for future use as a natural nitrogen fertilizer supplement. (page 12)

**Esch, Clarice<sup>^</sup>** See Gilkison, Victoria (page 17)

**Evans, David** Analysis of Vegetation Health and Density within the Makalu Barun National Park, Nepal Using Supervised Classification of Remotely Sensed Data (Dr. John All) In this study a land cover classification is created of Makalu Barun National Park in northern Nepal from two separate expeditions to the park, the first conducted by Dr. Robert Zomer between 1990-92 and a second by Dr. John All in 2010. Specific ground cover types (classes) within remotely sensed satellite images of the park were created from detailed Ground Control Points (GCPs) acquired during the two expeditions. By defining the ground cover at each GCP it is possible to analyze the entire park and reveal the changes that have taken place in the intervening years between the two expeditions. Our analysis indicates that a Maoist insurrection in Nepal during this time period had dramatic effects on both the structure and productivity of the vegetation. (page 12)

**Fedor, Elizabeth** See Vasa, Shradha (page 19)

**Ferguson, Christopher** Effects of Cultivars and Selected Environments on Tomato Production at Bowling Green, Kentucky (Dr. Elmer Gray) This study compares tomato (*Lycopersicon esculentum*) cultivars "Mountain Spring" and "Mountain Fresh" grown in two environments (high plastic tunnel, garden) and subjected to three mulch treatments (none, leaf, manure). Production was based upon total number, weight of fruit and percentage of cull and marketable fruit. Preliminary results for most variables were inconsistent. There were no significant ( $p > 0.05$ ) differences between the cultivars. Tunnel and garden environment differences were not significant ( $p > 0.05$ ). However, the percentages of marketable fruit were consistently higher for tunnel than garden for numbers and weights of fruit. Differences among mulch treatments were not significant. A similar experiment is planned for 2011. (page 19)

**Ferguson, Jack<sup>^</sup>, Christopher Simouth, Andrew Edge, and Jenna Binion** Fluorescein and FITC Derivatives Functionalized Silsesquioxane/Bridged Silsesquioxane Nanoparticles: Synthesis, Characterization, and Particle Morphology (Dr. Hemali Rathnayake) Stable fluorescein or FITC functionalized silsesquioxane nanoparticles were prepared by base catalyzed hydrolysis of their respective silane precursors in the presence of catalytic amount of tetraethoxysilane (TEOS). Particle size and dispersity were controlled by adjusting the molar ratios of silane precursor, ammonium hydroxide and TEOS concentration. The size, shape and surface morphology of these functionalized particles were visualized using transmission electron microscopy and characterized by elemental analyses and FT-IR spectroscopy. We were able to optimize the reaction conditions to prepare smaller size nanoparticles in size ranging from 30 nm to 90 nm in size. Ultraviolet irradiation experiments at different time intervals determined these particles are highly stable. In the near future, we wish to use them for bio-imaging. (page 22)

**Fleischmann, Paul<sup>^</sup>** See Cooper, Anthony (page 23) and Stephenson, David (page 23)

**Flynn, Elaine\* and Andrew Wulff** Use of Zoned Minerals to Determine Petrogenetic Processes (Dr. Andrew Wulff) As minerals grow in sub-volcanic magma chambers, successive layers, or zones, are representative of the magma composition and temperature. Three main types of concentric zoning profiles – normal (slow continuous cooling), reverse (mixing of new magma in the magma chamber), and oscillatory (small local variations) – may be used as

indicators of petrogenetic processes in the magma chamber. Optically continuous zones can be identified using polarized light microscopy, but compositional data cannot be obtained to distinguish types of zoning profiles of the minerals. Electron microprobe, SEM-EDS, and Raman microscopy were used to obtain compositional data through point analysis and compositional maps of zoned minerals. These zoning profiles were used to identify the petrogenetic processes responsible for generating different lavas. (page 15)

**Forshee, James** See Smiley, Shawn (page 22)

**Franklin, Sarah** See Scherzer, Tracy (page 18)

**Frederick, Chelsea** Bowling Green Organic Market (Prof. Laura Leach) Organic markets bring items that are locally and organically produced to an easily accessible place. Bowling Green currently houses an organic farmers market available only seven months of the year. Having a place that is accessible year round would benefit Bowling Green and farmers who rely on local support. Research of organic markets has resulted in a design that would thrive in Bowling Green. The proposed indoor retail space is framed with steel and timber and houses indoor farmer stands, produce and shelf items. Retail and production greenhouses constructed with steel columns interact with the indoor retail space. Polycarbonate plastic lines the greenhouses and a gable roof system allows for natural light and ventilation. Organic markets are growing within the U.S. and this proposed organic market would support Bowling Green and the local organic farmers from surrounding areas. (page 11)

**Frost, Adam** See Kramer, Curtlyn (page 24)

**Fugate, Elizabeth\*, Natalie Schieber^, and Krysta Waldrop^** The Effects of Hydrogen Peroxide and Counterion on the Photolysis of Aqueous Nitrate Ion (Dr. Matthew Nee) Evaluating the interaction of hydrogen peroxide and hydroxyl radicals in the photolysis of aqueous nitrate ion is essential for understanding the photolysis of nitrate in snowpack, which is heavily influenced by chemicals released due to UV radiation. Using Raman spectroscopy, the interactions of hydrogen peroxide with nitrate during photolysis were studied. Samples of nitrate and hydrogen peroxide were photolyzed and Raman spectra were collected over the course of three hours for each sample. Samples were tested in which only the hydrogen peroxide or the potassium nitrate was photolyzed, in addition to samples where both species were photolyzed. In another study the effect of the counter ion was tested by using samples of ammonium nitrate, calcium nitrate, and sodium nitrate. This was done to assess the impact of different electric fields on the structure of the nitrate ion. There was a distinct difference between the Raman spectra of the samples. (page 14)

**Gaharwar, Meghana** Smoking among College Students: A Comparative Study between Smokers and Non-Smokers (Dr. Marilyn Gardner) Smoking is one of the leading causes of death in the United States. According to Centers for Disease Control and Prevention more than 440,000 deaths in the U.S are related to cigarette smoking. In past 20 years, there has been a considerable decrease in the number of smokers; however, only a minimal reduction in college-age smokers has been observed. Approximately, 85% of current adult smokers started smoking before the age of 21 years; therefore, smoking in youth is of particular concern as early initiation is associated with life-long smoking. In a recent study, more than 28% of college students are smokers, which is significantly higher compared to the U.S adult smoking rate (20.6%). Smoking among college students is strongly influenced by gender. (page 19)

**Gaines, Mitchell, Ronnie Leeper, and Rezaul Mahmood** An Analysis of WRF Physics Parameters for the January 29-30, 2008 Ohio Valley Squall Line Event (Dr. Rezaul Mahmood) On January 29-30, 2008 a squall line of thunderstorms moved through the Ohio valley with over 300 reports of severe weather, making the accurate forecasting of such events important. Modeling is a key component to any forecast. This study examines performance of several parameterization scheme combinations in the Weather Research and Forecasting Model. These include cloud microphysics, cumulus parameterization schemes and the planetary boundary layer with 12 WRF simulations. The WRF simulations for temperature, dewpoint, relative humidity, and precipitation for several locations in south-central Kentucky were compared to Kentucky Mesonet observations. Overall the most satisfactory combination of schemes included the WRF single-moment 3 class Microphysics Scheme for microphysics, Kain-Fritsch for cumulus parameterization. (page 19)

**Gaskin, Leigh, James Miller, and Nikki Byrd** Gales Point Cemetery Restoration (Dr. Molly Kerby) Gales Point Manatee is a small peninsula on the east coast of Belize. This community of farmers and fishers live in a rural environment between two lagoons. The land is composed of sandy soil, which has seen mass erosion in the last 50 years. This has encroached on the community cemetery community and has forced reuse of graves for many generations of residents. Our research was gathered during January 2011 on the interdisciplinary IMACT study abroad program. The rotary club of Louisville, Kentucky sponsored a \$100 solution to beautify and begin to restore and reclaim land for this community's cemetery. The community space is important to the cultural fabric of the community, namely rituals surrounding death. Our presentation explores the impacts of this space and the process of working with other cultures in their community development. (page 18)

**Gaulle, Owen\*, Louis Strolger, and Barbara Still** Evaluating the Lyrid Stream from a High Altitude Balloon Experiment (Dr. Louis Strolger) We will collect and analyze micrometeorites from a near space environment to determine the origins of the material – remnants from the formation of the solar system or volcanized materials ejected from neighboring planets. Our goal is to sample debris from the Lyrid stream, believed to have formed over 2600 years ago, which the Earth crosses on April 22, 2011. We are designing an aerogel-based apparatus to sample debris at approximately 100,000 ft, where upon recovery, we will use the WKU NOVA center scanning electron microscope to determine the petrology of the sample. The results will help confirm the origins of the Lyrid stream and, more importantly, provide us with the knowhow to further explore near space in new ways. (page 22)

**Gilkison, Victoria^, Makka Wheeler^, and Clarice Esch^** Examination of *Heliconia* Habitat Preference in Cloudbridge Nature Preserve (Dr. Keith Philips) Heliconias (family Heliconiaceae) are hummingbird-pollinated flowering plants found in the tropical forests of South America. These plants are composed of a series of colorful bracts, each housing one flower. The flowers bloom for one day each in an alternating pattern until all the bracts have opened; afterwards the flowering portion of the plant dies. In January 2011 we conducted a study at the Cloudbridge Nature Preserve in Costa Rica to examine the habitat preference of the native Heliconias. Data was collected for several variables: elevation, vicinity to water, forest type, percentage canopy cover, height, life within bracts, and coloration. Although the data collected was largely preliminary, results do indicate a preference for nearness to running water and show that Heliconias are absent in elevations greater than 6000 ft. (page 17)

**Gilliland, Josh and Josh Durkee** A Climatology of High-Winds Events from Post-Tropical Cyclones during 1951-2009 (Dr. Josh Durkee) During 1951-2009, 47% of all tropical systems within the Atlantic Basin transitioned to post-tropical (extratropical) classification. These systems are capable of producing hurricane-force winds across portions of the eastern United States. This study provides a climatological foundation for high-wind observations that are due to post-tropical storm systems. Post-tropical storms were identified and tracked using six hourly observations from the National Hurricane Center's HURDAT dataset. Mean wind radii buffers were used to determine the high-wind observations attributed to post-tropical storms. For this study, the geography and climatology of post-tropical storms and resultant high winds were analyzed using geographic information systems. Initial findings show that of the 47% of all post-tropical systems, 25% made landfall in the U.S. and were used for this study. Post-tropical systems primarily occur between 41°N-45°N, east of 100°W, with a mean migration toward the northeast. (page 9)

**Ginter, Christopher and Matthew Nee** Temperature Dependent Study of Nitrate Photolysis and the Effect of Hydrogen Peroxide (Dr. Matthew Nee) In aqueous solutions of nitrate the symmetry breaking of the symmetric and asymmetric stretches has been well documented, revealing multiple molecular structures. In comparing the relative ratios of these structures through spectroscopy it is possible to observe changes in the environment of the solution. Through IR spectroscopy we observed the change in the asymmetric stretches as a function of time following a five-minute photolysis of aqueous solutions of nitrate. Separately, aqueous solutions of nitrate were analyzed as a function of time following photolysis under constant exposure to the LED source. This study was performed at various temperatures to determine temperature dependence of the nitrate stretches using a computer controlled cell. Benzoic acid was used to determine if peak splitting is viable as an environmental indicator. (page 10)

**Golden, Kyle** An Art Center for Those Who Don't Have a Place to Call Home (Prof. Laura Leach) The truth about art is that art is always evolving, always changing, and forever being new. Louisville's Alternative Arts Center will provide a home for those artists who have chosen the streets to perform. Graffiti, cardboard sculpture, and metal sculpture artists, hip hop dancers, improv performers, and street drummers will now have a place to practice and refine their art forms. This proposed art center has been designed to celebrate the art of those not heard, not seen, not felt. Through observation and research of ever-growing media that celebrates individual's non-traditional artwork, designs for these particular artists' needs are being accommodated to allow for the artists to practice and perform. (page 14)

**Gole, Pragati, Darlene Shearer, Diane Sprowl, and Varun Malayala** Fruit and Vegetable Consumption among Immigrant and Non-immigrant Women Served by WIC in South-Central Kentucky: A Needs Assessment (Dr. Christine Nagy) This study assessed dietary patterns of immigrants and non-immigrants served by the WIC program in south-central Kentucky. The study proposed to identify intake of fruits and vegetables, perceptions of intake, consumption preferences, and common barriers. Respondents included women from United States (n=100), Burma (30), South America (33), Bosnia (10), and other countries (7). Healthy People 2010 recommends eating two cups of fruits and three cups of vegetables per day. Results indicate that most respondents ate one or two cups of fruits and vegetables per day and felt that amount adequate. Burmese women perceived high cost (70%) and unavailability (33.3%) as the major barriers, while American (48%), Spanish (42.4%) and Bosnian (40%) women felt that lack of time was the major hindering factor to eating fruits and vegetables. This presentation will provide information on how to tailor an intervention and develop materials to better meet the needs of immigrant and non-immigrant WIC women. (page 20)

**Gott, Andrew** Determining Star Formation Rates of Supernovae Host Galaxies (Dr. Louis Strolger) Very little is known about the conditions that produce Type Ia supernovae (called the progenitor model) or the environments of their host galaxies. We are using spectra from supernovae host galaxies to determine the galaxy's star formation rate (SFR). We measure the width of the hydrogen alpha spectral line to determine the integrated flux under the emission line at that wavelength. This integrated flux is directly related to the SFR. Knowing the SFR of supernovae host galaxies can give us a better idea of the conditions needed to produce a supernova. (page 17)

**Gott, Andrew** See Sadler, Suzanna (page 12)

**Gourley, Ryan, John All, Sean Hutchison, and Kamal Humagain** Spatiotemporal Aspects of Fire in Nepal (Dr. John All) Fire is a controlling factor of many systems throughout the world, and its various aspects are integral to ecological research. An examination of the spatiotemporal aspect of a fire can reveal information about potential post-burn impacts and is useful for natural resource management. The south Asian country of Nepal has effectively no fire management and limited research has been conducted on the occurrences of fire throughout the country. In this study we analyzed the burned areas of Nepal over a 10-year period using remote sensing and geographic information systems. The three physiographic regions of Nepal were examined independently to account for differences in land cover and human activity. Additionally, burned areas in protected parks were contrasted to non-protected areas. The results are presented spatially and the implications for resource management are interpreted. (page 15)

**Greco, Lindsey** See Perkins, Scott (page 13)

**Greco, Lindsey** Gender Differences in the Perceived Costs and Benefits of Workplace Mistreatment (Dr. Tony Paquin) Workplace mistreatment, in the form of both incivility and aggression, can have a major impact on personal and organizational outcomes. The purpose of this study is to examine the mental judgments that individuals make before engaging in either uncivil or aggressive behavior. Regression analysis were used to analyze data in terms of both the potential costs and the potential benefits that an instigator could expect from engaging in such behavior, with specific emphasis on gender differences in cost/benefit expectations. Approximately 170 employees completed the survey. Preliminary analyses show a trend of fewer perceived costs and more perceived benefits for male participants relative to female participants. (page 19)

**Green, Christopher** Dating Preferences among African-American Female College Students: Attitudes about Appearance, Trust, and Interracial Relationships (Dr. Joan Krenzin) In-depth interviews were conducted with African-American female college students ranging from freshmen to graduate level. Students were asked about their dating preferences for African-American men. The study investigated how physical appearance, trust, and attitudes about interracial relationships affected their dating selection. Symbolic interactionism and dramaturgy were the theories used within this study. This study found evidence that supports existing literature on attitudes of distrust among African-American females toward African-American males, with lying, physical aggression, and cheating as top reasons. Distrust based on the females' viewpoints began with listening to warnings from their mothers about men's behavior. This study, however, found that dating preferences among females interviewed did not recognize physical appearance, such as light or dark skin preference and body-frame preference, as a significant factor for date selection. (page 19)

**Greenwell, Lesley** Using the Web Wisely: Assisting the Nonprofit Sector with Technology Use (Dr. Jennifer Mize Smith) This study explores the unique difficulties nonprofit professionals may experience in creating and maintaining online presence. Both quantitative and qualitative methods in the form of an online survey and a focus group were used to gather data from nonprofit practitioners around Bowling Green. Findings revealed that nonprofits suffer from limited resources, like time, funding, personnel, and expertise, that impede their ability to take advantage of websites, social networking, and online grant research. In an attempt to address the needs identified by participants, research results were used to develop a series of training workshops facilitated by professionals in the interest areas. Workshop topics included web design, social networking, and grant research. The workshops were free to nonprofit staff and provided applicable knowledge. (page 11)

**Greenwell, Mary \*** See Ayers, Claci (page 23)

**Greenwood, Emily\*** Fannie and Freddie: America's "Affordable" Housing Crisis (Dr. Robert Pulsinelli) The recent housing crisis was caused by a variety of factors. This paper explores what the author believes to be the main cause of the housing crisis: affordable housing legislation and the lack of regulation of Fannie Mae and Freddie Mac. After reviewing mortgage-backed securities, the operations of Fannie and Freddie, and the Housing and Community Development Act, the author concludes that legislation produced an environment that led to the over-issuance of mortgage-backed securities and the ultimate downfall of the financial system. (page 15)

**Gries, Christine** See Huff, Amanda (page 17)

**Gunter, Angela** Motivation for High School Students to Read: Differences among Student Perceptions and Differences between Student and Teacher Perceptions (Dr. Marge Maxwell) Many high school teachers are unaware of, or mistaken about, specific strategies and practices that actually motivate their students to read, and that what motivates one group of students may not motivate another. Although content-area instructors may not have been trained in teaching reading strategy and may feel as though teaching reading is not their job, it is an expectation that could largely be met by the implementation of motivational strategies. This exploratory study utilized the expectancy theory of motivation and was conducted to determine which strategies and practices would be most motivational for high school students to read. In a survey created by the researcher, student participants were identified as having high or low self-efficacy and high or low value of reading. Also included in the survey were 27 motivational strategies and practices garnered from previous studies and research among all age groups. (page 13)

**Gutierrez, Alex<sup>^</sup>, Rodney King, and Claire Rinehart** Genome Discovery and Exploration (Dr. Rodney King) The goal of the Genome Discovery and Exploration class was to engage first-semester freshman in a real scientific research experience. The semester-long project was to isolate and characterize novel bacteriophages from the environment. Students collected soil samples and enriched them for viruses that grow on *Mycobacterium smegmatis*. After several rounds of purification, the phage was viewed by electron microscopy to determine its morphology. The phage particles had an icosahedral head and a tail and the purified phage was named "HerpaDerpicus." HerpaDerpicus genomic DNA was isolated and analyzed by restriction digestion and gel electrophoresis. The results of this analysis were compared to the results reported by the other class participants. From these comparisons, we conclude that HerpaDerpicus is a unique mycobacteriophage. (page 23)

**Gutierrez, Anthony<sup>^</sup>, Rodney King, and Claire Rinehart** The Journey of a Bacteriophage, Pestilence (Dr. Rodney King) A bacteriophage is a virus that exclusively infects bacteria and they can be found almost anywhere. To test this, soil from A. Gutierrez's backyard was collected. In order to isolate phages from the soil sample, it was necessary to perform an enrichment. After several rounds of purification, a bacteriophage was isolated and it was named Pestilence. Electron microscopy was used to view the purified phage particles. Many bacteriophages have the same morphology, but they can differ dramatically on the genetic level. Therefore, genomic DNA from Pestilence particles was isolated and analyzed by restriction analysis and gel electrophoresis. From this analysis, we conclude that unique bacteriophages can be easily recovered from the soil. (page 23)

**Harp, Jessica** World War II Propaganda Poster Design (Prof. Matt Tullis) The objective of my student research project is to visually convey the style and design of World War II era propaganda posters. These consist of anything from war efforts to production themes and even public health recommendations. I will communicate the comparisons and contrasts between the poster designs of the United States, Britain, and Germany. One infamous or easily identified recruitment image from each stated country is accented. Photographs from the time period are included to create historical reference. I hope to capture the viewer with how these artists were able to use design to reach the public and evoke a response. (page 21)

**Harris, Meagan\*** Solitary Souls: Transcendence through Death in Chopin and Whitman (Dr. Ted Hovet) Kate Chopin's novel, *The Awakening*, depicts the stifled solitary song of main character, Edna Pontellier, in a cacophony of societal standards. My research positions the work as a feminine counterpart to the transcendental literary movement of late 19<sup>th</sup> century America. Employing works of intertextual relevance, namely Whitman's maturation poem, *Out of the Cradle Endlessly Rocking*, I compose an intimate analysis of Chopin's feminist critique against the background of her cherished contemporaries. I define Edna's transcendental motivations for committing suicide through analysis of Chopin's recurrent symbolism, themes of disillusionment and self-actualization, alongside Edna's inability to achieve solitude, an inability that is not present in the works of male Transcendentalists. (page 18)

**Harper, Chloe** See Carpenter, Kathryn (page 24)

**Hart, Christopher and William Hess** Rock Units and Possible Fault Occurrences at McChesney Field Campus (Dr. Andrew Wulff) The McChesney Field Campus is located north of Bowling Green in Warren County where the Indian River enters the Green River. The basic goal of this project is to develop a map of the surficial geology and associated structures that may be used by geology students and others interested in utilizing this versatile field campus. The map being developed is based on an earlier map from the Kentucky Geological Survey at the 7.5-minute quadrangle scale. Geological units exposed include the Big Clifty, Hardinsburg, and Tar Springs sandstone units and the Haney and Glen Dean limestone units. The second task is to identify key points of interest in the McChesney area. Outcrops and other exposed rock surfaces with structural or sedimentary structures were located and marked on the map. Sites suitable for stream gauging stations were located on the Indian and Green Rivers for measuring stream flow parameters. (page 14)

**Hart, Jay** See Sowell, Dewayne (page 12)

**Hatler, Ellen\*** Can't Even Shout, Can't Even Cry: Communication and Community in Buffy the Vampire Slayer's "Hush (Dr. Ted Hovet) This work explores the plot, themes, critiques, and fandom of the Buffy the Vampire Slayer episode "Hush." It studies contextual material from the actors and producers of the show, as well as critical reviews and fan reactions. Within the episode, the plot and imagery come together to form two strong interwoven themes of communication and community. This project begins with a brief summary of the characters, setting, and episode to give context. It then examines why these themes are particularly resonant on screen, and how the episode becomes a unique viewing experience with a cult following. (page 18)

**Hawtrey, Samantha<sup>^</sup>, Rodney King, and Claire Rinehart** The Isolation and Characterization of Luke117, a Novel Mycobacteriophage Isolated from Union, Kentucky (Dr. Rodney King) Bacteriophages are the most common DNA-containing entities on earth, yet few have been characterized. My goal was to isolate and characterize a novel mycobacteriophage from the environment. *Mycobacterium smegmatis*, a common inhabitant of soil, was used as the host strain. A new phage, named Luke117, was isolated and purified from a soil sample taken from Union, Kentucky. Large numbers of Luke117 phage particles were prepared for analysis. The morphology of the phage was determined by electron microscopy, and the capsid and tail were measured. Genomic DNA was isolated from purified phage particles and analyzed by spectrophotometry, DNA restriction analysis and gel electrophoresis. The results were compared with those of the other students in the Genome Discovery and Exploration class, revealing that Luke117 is unique. (page 21)

**Heeb, Emily** See Scherzer, Tracy (page 18)

**Heeke, Theo** See McPeak, Ryan (page 16)

**Henson, Marshall** See Hinson, Kevin (page 16)

**Herchenrader, Kayla** Barren River Sports Center (Prof. Laura Leach) The goal of this project was to create a sports facility to accommodate the needs of the Barren River Area Volleyball Organization while incorporating sustainability. Club volleyball organizations are continuing to grow at rapid pace, and many girls turn to club teams to get recognized for their outstanding ability in order to receive college scholarships. This proposed facility will ultimately help the Barren River Area Volleyball Organization become more competitive in the city of Bowling Green, Kentucky by having the space to expand the organization and raise revenue. Research and interviews were conducted in order to determine the best possible ways to create an environmentally friendly facility. (page 15)

**Hess, William** See Hart, Christopher (page 14)

**Hibbler, Jr., Bennett** The Harlem Renaissance (Prof. Matt Tullis) During the Harlem Renaissance, there was a rise in African-American influence in the arts. This composed piece focuses on just three of the many artists who brought changes in the way art was portrayed. My design features three influential artists of the Harlem Renaissance, which saw its prime during the 1920s through the 1940s. The artists I chose to include are Jacob Lawrence, Romare Bearden, and Aaron Douglas. All three of these men brought a unique style of design to the mainstream art scene. During the Harlem Renaissance, art saw a change as African American artists emerged with a whole new look and feel on art and how it was portrayed. In my work the different styles will be present and visible depicting how different techniques yield different responses from the observer. The various styles of art are displayed here. (page 20)

**Hill, Leslie** Exploring Midcentury Modern Furniture (Prof. Matt Tullis) My goal in researching three midcentury modern furniture designers is to better expand my knowledge of their design processes, as well as learn the background that led them to furniture design. My interest in midcentury modern furniture comes from my fascination for sleek clean lines that create unique forms. The resulting written report and digital collages are based on the following furniture designers: Eero Saarinen, Gerrit Rietveld and Arne Jacobsen. I propose to communicate this newfound knowledge through visual communication of digital collage and a written paper. (page 21)

**Hinson, Daniel\*** Synthesis of Some Group VII Pyridazine Complexes (Dr. Chad Snyder) Heterocyclic organic and organometallic compounds (e.g. polypyrrole) and their derivatives have been of great interest for conductive polymers due to their novel properties and environmental stability as compared to non-aromatic analogs (e.g. polyacetylene). We are interested synthesizing organometallic pyrroles from pyridazyl complexes for polymer research. Pyridazyl complexes of rhenium were synthesized in three steps beginning from 1,2-diacylcyclopentadienes. These complexes are expected to undergo ring contraction to their corresponding pyrrole complexes by utilizing the Boger and coworker's conditions. 1,2-Diazines treated with activated zinc powder in glacial acetic acid yielded pyrroles in high yield (up to 92%). Synthesis and characterization of  $[\text{Re}(\text{CO})_3\{1,2\text{-C}_5\text{H}_3(\text{CRN})(\text{CRN})\}]$  are reported here. (page 14)

**Hinson, Kevin\*, Marshall Henson, and Seth Renfro** Unbonded Capping System (Dr. Shane Palmquist) Concrete masonry block units (CMUs) typically have rough surfaces that may be uneven. For the purposes of compression testing, CMU blocks are capped to create a smooth and relatively even surface in accordance with ASTM C 140, Standard Test Methods of Sampling and Testing Concrete Masonry Units. Unfortunately, capping of a single CMU

block following the procedures in ASTM C 140 is extremely time consuming and expensive. An unbounded capping system has been initially developed and is explored as a means of rapid and inexpensive testing of CMU block. The results of this system are discussed herein. Results show that the use of the unbounded capping system increases productivity while significantly decreasing testing costs. (page 16)

**Hoette, Adam and John All** Building the Sustainable Home (Dr. John All) This research examines the methods and technologies involved in building an energy efficient and sustainable home. With the inevitability of rising energy prices and higher environmental costs, residential homes present an opportunity to advance the field of sustainability. In a low-cost utility state such as Kentucky, homes are typically built without energy efficiency in mind. However, as the public consciousness surrounding the consequences of such practices begins to grow, changes will occur. Many more homes than ever before are constructed with a more holistic approach than the traditional norms, with consideration given to the overall sustainability and environmental performance of the project. This trend will most certainly continue to grow in popularity. In this research, the major components of a home have been examined, and sustainable and efficient materials options are highlighted. (page 13)

**Hook, Margaret and Bruce Schulte** Effect of Simulated Predation Risk on African Elephant Behavior (Dr. Bruce Schulte) African elephants (*Loxodonta africana*) experience little predation pressure; however, for young and adult females risk increases in dry conditions. Risk assessment was examined by playing calls to elephants from Addo Elephant National Park in South Africa. Two different lion calls, static, running water, and bees were played. A remote speaker was placed by waterholes before elephants were present. Groups' initial entry, 30 second of a call, and five minutes after were recorded by video. Behaviors of individuals, group composition and nearest neighbor were extracted. Preliminary analysis suggests lion calls produced more behaviors identified with stress from elephants. Results will be examined in light of elephant age, sex and status with the potential application of using lions calls to reduce human elephant conflict. (page 9)

**Houser, Kristen\*** Humans on Earth: How Communities in Five Bioregions are Adapting to a Changing Cultural and Ecological Landscape (Prof. Josh Meltzer) For my capstone experience project, I traveled to five bioregions, diverse in culture, geography and population. My intent was to document the lives of people living in community there and how they are adapting to a changing cultural and ecological landscape. The state of our planet and world affairs is unavoidable, especially as a student of photojournalism. Our psyches are bombarded with images of climate change, resource wars and the loss of culture, even reaching to the far corners of the globe. I chose to capture the lives of people in communities in Washington D.C., Guatemala, California, Mexico and Belize who are adapting to this state of affairs, either intentionally or out of necessity. (page 11)

**Howard, Ben<sup>^</sup> and Joyce Tucker<sup>^</sup>** A Mathematical Model to Analyze the Treatment of a Wound against Bacterial Infection (Dr. Richard Schugart) A mathematical model was developed focusing on using oxygen therapy to fight bacterial infection in chronic wounds. The model is a set of ordinary differential equations, which describes the relationship among neutrophils, bacteria, inflammatory cytokines, and reactive oxygen species (ROS). A quasi-steady-state assumption was made for the inflammatory cytokines and ROS by setting the derivative equal to zero for all time. This reduces the model to a system of two equations – neutrophils and bacteria. A steady-state analysis was conducted on the neutrophil/bacteria system to evaluate what happens when time goes to infinity. Model parameters were estimated from both values found in the literature and the steady-state analyses. Model simulations were conducted using Mathematica. (page 16)

**Howard, Victor** Disney's Legendary Animators (Prof. Matt Tullis) The objective of my student research project is to create effective visual communication that centers on the contributions made by three significant Walt Disney animators. In a series of three posters I will highlight animators Ub Iwerks, Art Babbitt, and Carl Barks. Each design will secondarily highlight their most famous characters and a collaged collection of their animated contributions. This poster series will collectively present each animator and their contributions that won them the honor of becoming a Disney legend. (page 21)

**Huang, Wei** Use of Online Social Networks for Cultural Anxiety among International Students in the U.S. (Dr. Kumi Ishii) International students studying abroad have to adapt to a new cultural environment. This paper concerns the importance of using online social networks in dealing with cultural anxiety and uncertainty among international students in the U.S. The research uses anxiety/uncertainty management theory and social network theory to analyze the roles online social networks played with international students in their adjustments to a new culture. The study will also examine how international students obtain help from online social networks. Implications for further research are discussed. (page 13)

**Huang, YuPing** See Vasa, Shradha (page 19)

**Huff, Amanda\*, Whitney Tyree, and Christine Gries** A.R.T.E.M.I.S Double Prime (Dr. Kevin Schmaltz) Lunar exploration remains a key topic of interest to the National Aeronautics and Space Administration. This year the



Kennedy Space Center is hosting the 2<sup>nd</sup> Annual Lunabotics Mining Competition, for which teams must design, build, and operate a remotely controlled device capable of excavating, transporting, and discharging lunar regolith simulant. WKU sent an interdisciplinary team-designated A.R.T.E.M.I.S. to the inaugural competition in 2010. A team of three senior mechanical engineering students from the original team, still designated A.R.T.E.M.I.S., is currently working to complete a redesigned device for this competition. The 2010-2011 A.R.T.E.M.I.S. team will review the completed device from last year and present the modified design that is being completed and tested for the May competition. (page 17)

**Humagain, Kamal** Biogeographical Trends along Elevational Gradient in Nepal (Dr. John All) Latitude and altitude are the major factors contributing to global biogeographical trends. In the Himalayan country of Nepal, elevation differences and complex geography define species richness in north-south transects. Mountain slopes, in general, have unimodal distribution of species, gradually decreasing towards the top. Climate and other environmental variables are responsible for this trend. High altitude and harsh climatic factors limit the richness but increase endemism. The trend is interrupted by increasing human activities, dispersal barriers, competitive exclusion, and invasive species. These factors, coupled with climate change, are deteriorating the natural habitat of important species in fragile mountain ecosystems. Using biogeographical analysis, mitigation measures can be created to direct conservation activities. (page 10)

**Humagain, Kamal** See Gourley, Ryan (page 15)

**Hunton, Ryan** Poetry between the Lines: The Significance of Stage Directions in Eugene O'Neill's Plays (Dr. Walker Rutledge) Many critics consider Eugene O'Neill to be the premier playwright of the modern American theatre. In Harold Bloom's foreword to O'Neill's magnum opus, *Long Day's Journey into Night* (1941), he calls attention to Eugene O'Neill's stage directions in the final moments of the play. Bloom asks, "How much of the power here comes from what [the characters] Tyrone and Mary say, and how much from the extraordinarily effective stage directions?" Throughout O'Neill's career, he was criticized mostly for failing to master or capture the beauty of authentic American English. While this criticism is argued even today, O'Neill's genius lies instead in his ability to incorporate into his stage directions poetic subtleties that cannot be expressed with words. Here in the italics one finds what enriches his drama and transforms it into art. (page 11)

**Hutchison, Sean** Influence of Decadal Climate Variability on Vegetation in Mammoth Cave National Park (Dr. John All) The causes of global climate change are a much-researched topic; however, the influence of climatic changes on environmental systems is currently understudied. This study focuses on the implications of climate change on vegetation in central Kentucky. Using remote sensing, the photosynthetic activity of Mammoth Cave National Park is tracked for a ten-year period. Vegetation maps for Mammoth Cave are overlaid on the remote sensing data, which are clipped according to the dominant vegetation classification. The remotely sensed vegetation classes are then statistically tested against climate data, and correlations between vegetative productivity and climate are sought. Future changes in vegetation are extrapolated from the findings. (page 19)

**Hutchison, Sean** See Gourley, Ryan (page 15)

**Ibekwe, Oporuiche and William Mkanta** The Correlates of First-Time Alcohol Abuse Treatment in Formal Service Settings among Individuals in the State of Kentucky (Dr. William Mkanta) Substance abuse is a serious public health problem. Its treatment is costly because of intensity of services, especially when mental health issues are involved. We examined factors associated with first-time receipt of alcohol abuse treatment in formal healthcare settings in the state of Kentucky. Analysis was based on the state level Treatment Episode Data Set - Admissions of the 2008 Substance Abuse and Mental Health Data Archive (SAMHDA). First-time treatment for substance abuse was given to 9,967 individuals in the state. Substance abuse and treatment facility types were assessed. Nearly 40% of the patients had alcohol abuse problems. One-third of the patients were aged between 21 and 29 years, and the majority were male (64.1%), white (87.3%) and received treatment in outpatient settings (60%). The data showed 33.5% of the patients were daily users of their reported primary substance and 24.2% had psychiatric disorders. (page 9)

**Igleheart, Chasen** Salo: An Attempt to Remake the Violence of Reality (Prof. Yvonne Petkus) My work deals with internal conflicts experienced in day-to-day life ... being alive ... always being a stranger, a foreigner, and an American ... all one experiences being overwhelmed by reality ... the staggering influx of the conscious. In my art making process, it is knowing there are no truths, no speakable absolutes; the pursuit of decision making departs from a place of isolation that cannot anchor right from wrong, good from evil, terrorist from revolutionary but only map visual decisions. It is in that questioning and doubting of myself that my imagery and mark-making occur, not one idea, not one truth, but the overall essence of reality, both abstract and concrete. Structures once sound become fleeting and ambiguous, earth shifts and perspectives bow, all in an influx that cripples me and makes me question again and again to attempt the understanding of what is trying to exist. (page 21)

**Jackel, Daniel and Douglas Smith** The Effects of Computer Ownership, Internet Accessibility and Broadband Access on Educational Assessments (Dr. Douglas Smith) Scholars often claim that the level of resources available to students at home, in school, or in the community enhance their school experiences. It has been argued that computer and Internet accessibility are an increasingly important part of this equation. This study examines the effects of three different measures of technology access on educational assessments in high schools in the 177 school districts in the Commonwealth of Kentucky in 2005. Specifically, the Commonwealth Accountability Testing Systems (CATS) scores will be regressed on computer ownership, Internet accessibility and broadband access controlling for demographic characteristics. (page 13)

**Jackson, Joshua<sup>A</sup>** A Survey of the Biodiversity of Dung Beetles in the Nimba Mountain Range, Guinea, West Africa and Surrounding Area (Dr. Keith Philips) The Nimba mountain range in southeastern Guinea has the highest elevation in West Africa and contains both high elevation grassland and mid elevation forest habitats. This region contains many endemic species, including a viviparous toad, orchids, and an otter shrew. Biodiversity is extremely threatened due to habitat destruction via a rapidly expanding human population, iron ore mine development, agriculture, as well as bushmeat hunting. Dung beetle samples were collected during June 2010 from grassland and forest habitats as well as in the nearby lower elevation forest in the Bossou Chimp reserve. A total of 158 specimens, including 20 species, were collected; 18 species were discovered in Bossou and 16 species in each of the grassland and forest. (page 23)

**Janarthanam, Arul** See Advani, Shailesh (page 20)

**Janvier, Gasana** See Stanam, Aditya (page 13)

**Jennings, John, Donald Slocum, Thomas Reinscheld, and Paul Whitley** Ortho-Metalation of Para-Bromo and Para-Iodoanisole Utilizing Ortho-Lithiodimethylbenzylamine (Dr. Donald Slocum) One of the most daunting challenges for a synthetic chemist is to develop protocol which will afford regiospecific substitutions around the most commonly found organic group, benzene. Millions of useful and commercially produced compounds can be synthesized using this methodology. Using a new preparation of ortho-lithio-para-Bromoanisole and ortho-lithio-para-Iodoanisole, 19 derivatives have been prepared using the selective and regiospecific process. A special ortho-metalating reagent, ortho-lithiodimethylbenzylamine (o-LiDMBA) is produced and quenched in the laboratory. Using this specific reagent we were able to preserve the halogen (Br, I). This o-LiDMBA needs no purification and the DMBA reagent can be extracted upon acidic work-up. Upon extraction dimethylbenzylamine (DMBA) then can be recycled and used in further synthesis. (page 15)

**Johnson, Aric<sup>\*</sup>** See Onwu, Cheryl (page 14)

**Jordan, Dustin** See Berry, Kyle (page 12) and Campbell, Lee (page 12)

**Kasten, Chelsea<sup>\*</sup>** The Air We Breathe: The Clean Air Act (Dr. Patricia Minter) The Clean Air Act was first passed by Congress in 1955 and has since been amended in 1963, 1967, 1970, 1977 and 1990. The Clean Air Act is critical for the established limits on air pollution and the continued improvement of air quality in the United States. The Clean Air Act was created to ensure that Americans were not being unnecessarily exposed to harmful air pollutants. It is the legislation that allows for the regulation and control over air pollutants and the sources that release those air pollutants. The Clean Air Act is important to the maintenance and improvement of air quality in the United States. Without the Clean Air Act to regulate pollutant sources, the air could be toxic to vulnerable populations in the U.S., if not toxic for the U.S. as a whole, causing different cancers and other health problems. Since it was created there have been several changes to the Clean Air Act to meet the demands of a concerned society. The original intent of the Act has been vastly expanded. (page 11)

**Keen, Courtney** See Miller, Tiffany (page 24)

**Kidd, Kelsey and Andrew Wulff** Timing of Emplacement of Dikes in the Cowhole Mountains, California (Dr. Andrew Wulff) The Independence Dike Swarm (IDS) stretches 500 km from the central Sierra to the Transverse Ranges. Dikes strike NW with steep dips to the NE. Three compositionally distinct magmas and textures are represented: felsic aphanitic, mafic aphanitic, and intermediate porphyritic. Ages of 148 million and 90-95 million years ago were assigned to dikes establishing the IDS as an important structural and temporal feature. The dikes we examined are located in the Cowhole Mountains. They resemble IDS dikes in composition and orientation, and may represent the easternmost extent of the IDS. This research will determine timing of emplacement of the Cowhole dikes by examining the contacts between dikes. Feldspars from porphyritic dikes appear to be mixed into adjoining aphanitic dikes, suggesting coeval emplacement. Analysis of feldspar compositions will test this hypothesis. (page 15)

**Kramer, Curtlyn, Adam Frost, Lance Hahn, and Pitt Derryberry** The Effect of Sexual Context on Moral Decision Making in Men and Women (Dr. Lance Hahn) Men and women possess distinct strategies in handling sexual situations. This leads to two competing hypotheses about moral decisions within a sexual context. Either morality

within a sexual context is the same for both genders, or morality within a sexual context is altered by that context in ways that are consistent with gender-specific sexual strategies. To test these hypotheses, we presented sexual and non-sexual moral dilemmas to participants, asked them to resolve each dilemma, and assessed their stage of moral development based on their response. Our results will reveal how men and women make moral decisions and whether the genders differ in how they approach a moral dilemma concerning sex. This study will give us a greater insight into how men and women make moral decisions within sexual contexts. (page 24)

**Kurlawala, Zimple and Christine Nagy** Examining Perceptions of College Students about Organ Donation (Dr. Christine Nagy) Our study examined characteristics of college students who have consented to be organ donors vs. those who have not. A theory-based 76-item survey was completed by 360 college students at a south-central U.S. university assessing their knowledge and perceptions about organ donation. Intentions were strongly predicted by donors' attitudes, willingness to communicate, and ability. Fear of organ donation and mistrust of health care were the most common reasons for non-consent. Students who had donated blood were twice as likely to be organ donors ( $p=0.001$ ). The typical non-donor was more likely to be male, nonwhite, has fewer positive attitudes ( $p=0.03$ ), willingness to communicate ( $p=0.001$ ), motivation to comply ( $p=0.01$ ) and ability ( $p=0$ ). Results can certainly be used to develop organ donation consent improvement programs among college students. (page 13)

**Lartey, Grace** See Bhattarai, Alka (page 19)

**Laux, Zachary<sup>A</sup>** See Sahi, Nilesh (page 21)

**Lee, Morgan** Identification with a Collegiate Football Team and Perceived Levels of Stress at the Game and at Home (Dr. Frederick Grieve) Previous research has shown that team identification, especially high identification, offers many benefits to sports fans. The current study looked at the relationship between daily stress levels and sport team identification. Surveys to assess levels of stress and sport team identification were completed by participants prior to a football game, and a follow up survey was given over the telephone two to four weeks later. It was hypothesized that those with a high level of sport team identification would report lower levels of stress while at the game than at home. It was also hypothesized that fans with a low level of sport team identification would report no difference in level of stress at the game and at home. Results partially supported the hypotheses. (page 9)

**Leszczewicz, Jason** Portable Ultra High Vacuum Analysis Systems (Dr. Alexander Barzilov) Design and functionality concepts of this Ultra High Vacuum Analysis System (UHVAS), as well as particle accelerator applications and future plans, will be presented. (page 22)

**Li, Yan Fen, Yan Cao, Christopher Carmichael, Hou-Yin Zhao, Wei-Ping Pan, and Bangbo Yan** Synthesis, Structures and Photocatalytic Properties of Novel Hybrid Solids from Keggin Ions and Metal Coordination Complexes (Dr. Bangbo Yan) Three new hybrid compounds,  $[\text{Fe}(2,2'\text{bpy})_3]_3[\text{H}_2\text{W}_{12}\text{O}_{40}]\cdot 6\text{H}_2\text{O}$ ,  $[\text{Ru}(2,2'\text{bpy})_3]_2[\text{Mo}_8\text{O}_{26}]\cdot 6\text{H}_2\text{O}$  and  $[\text{Ru}(2,2'\text{bpy})_3][\text{W}_6\text{O}_{19}]$ , (2,2'-bpy = 2,2'-bipyridine) have been hydrothermally synthesized. These solids were characterized by elemental analysis, thermogravimetric analysis, UV-Vis spectroscopy, and X-ray diffraction. Their photocatalytic abilities on photodegradation of dye pollutants were also studied. (page 10)

**Lovell, Lori<sup>A</sup>, Rodney King, and Claire Rinehart** Isolation of Novus, a Novel Bacteriophage Isolated from Florence, Kentucky (Dr. Rodney King) Approximately 1,030 tailed phages exist across the globe. The purpose of this research was to explore the diversity of the bacteriophage population by isolating and characterizing new mycobacteriophages from the environment. A soil sample was collected from a wooded area in Florence, Kentucky. To increase the chances of recovering mycobacteriophage, an enrichment step was performed. A single plaque was picked and a high-titer lysate of the purified phage named "Novus" was prepared. Genomic DNA from Novus was isolated and analyzed by spectrophotometry, DNA restriction and gel electrophoresis. Finally, Novus particles were viewed by electron microscopy. The particles had long tails and they tended to clump together. Our analysis suggests that Novus is a unique bacteriophage. (page 22)

**Malayala, Varun** See Gole, Pragati (page 20)

**Mann, T.J.** See Price, Daniel (page 16)

**Martin, Virginia\* and Amy Poynter\*** Synthesis and Characterization of Analogs of the Anticancer Drug Oxaliplatin (Dr. Kevin Williams) Oxaliplatin is a third generation anticancer drug that shares similarities with the first generation drug cisplatin. We are interested in how the size and shape of these platinum compounds affect reaction with key biological molecules, especially proteins. We are therefore synthesizing a series of platinum compounds containing an oxaliplatin-like diamine ligand with additional bulk at the nitrogen atoms. The additional bulk leads to the formation of multiple stereoisomers, with distributions that differ depending on both the synthetic method used and the other groups that are connected to the platinum atom. We are characterizing the products with NMR spectroscopy and will be using HPLC to separate the isomers prior to their reactions with amino acids and proteins. (page 22)

**Mason, Cameron** The Hideaway Restaurant and Spa, Lake Malone State Park, Dunmor, Kentucky (Prof. Laura Leach) This project is the final project of our architectural undergraduate experience. We were given the freedom to decide the type of architectural form we want to design, yet given limitations to the overall size of the project. My idea is to design a restaurant and spa unlike any construction type located in the region. The restaurant will be a place where guests can enjoy American, Asian, Italian, and Spanish foods. I feel it is important to design a place where all nationalities and cultures can visit and enjoy camaraderie together. This proposed structure will attract tourists and vacationers alike, giving them an experience to remember. (page 22)

**Mattingly, Kyle\*** Analysis of the 3 January 2000 Tornado in Owensboro, Kentucky (Dr. Josh Durkee) This study analyzes the atmospheric conditions that led to the formation of a rare winter-time F-3 tornado that traversed Owensboro, Kentucky on 3 January 2000, and it highlights the impacts of this event on the city. Further, given that this event took place during a particularly strong negative El Niño-Southern Oscillation phase (i.e., La Niña), the possible relationship of this global teleconnection with this rare and particularly strong cool-season tornado is explored. Initial findings show that due to the cool-season timing, the synoptic environment preconditioned the event with limited atmospheric instability. However, modest-to-strong vertical wind shear was present. In addition to the rarity of this winter-time F-3 tornado, this event was especially noteworthy because it was the first confirmed tornado in Owensboro's 200-year history. (page 21)

**Mattingly, Sarah and Dana Bradley** Kentucky's Policies for Unbridled Aging (Dr. Dana Bradley) People are living longer and the older adult population is increasing. With approximately 1 in 20 residents of Kentucky expected to be over 60 by 2020, aging in the Commonwealth has taken on a new urgency. Kentucky's Policies for Unbridled Aging, a project funded through the National Association of Chronic Disease Directors (NACDD), focuses on developing a grassroots policy model to support policies that promote healthy aging in Kentucky. This poster describes the planning model that was based on the statewide infrastructure of the Partnership for a Fit Kentucky. Findings from a survey of over 300 stakeholders forms the basis for a "Healthy Aging" Plan for the Commonwealth. This poster concludes with recommendations aimed at increasing the likelihood of Kentucky older residents meeting nationally recognized physical and mental outcomes. (page 20)

**Maxwell, Morgan\*** The History of Zoological Gardens and the Current International, Federal, and State Laws that Govern Them (Dr. Michael Stokes) My research investigates the history of zoological gardens as they have evolved from circuses in ancient Rome to the modern zoos that list conservation and education as important objectives. How zoos structure their habitats and how zoos care for their exhibited animals has changed in many ways since the menageries in ancient times. New international laws have been enacted in the past century that govern wildlife trade and impact zoo exhibits. The United States also has enacted federal laws to protect and control wildlife, while states and local branches of law have enacted more selective laws and statutes that pertain to wildlife and affect zoos. My research will trace current laws affecting wildlife trade and zoos from the international level to the state level with emphasis on laws in different regions of the U.S. (page 11)

**McBride, Austin** Vietnam Era Psychedelic Poster Design (Prof. Matt Tullis) The objective of my student research project is to effectively communicate the visual and typographic styles of three influential 1960s-70s "psychedelic" poster designers, namely Stanley "Mouse" Miller, Michael English, and Wes Wilson. Although the general style of the period is strongly derived from the Art Nouveau movement of the early 20<sup>th</sup> century, each artist developed unique elements of geometry, color, typography and composition that helped create the aesthetic identity of the counter-culture. I shall communicate the styles of each artist in three corresponding portraits/digital collages. (page 20)

**McCoy, Kelly** See Cooper, Anthony (page 23) and Wittman, Rebecca (page 20)

**McKee, Aaron\*** See Patel, Amar (page 16)

**McKenna, Byerley** See Scherzer, Tracy (page 18)

**McPeak, Ryan, Jason Selby, and Theo Heeke** General Motors Fascia Drilling Project (Dr. Kevin Schmaltz) From the fabrication of automobiles to the bottling of beverages, our world revolves around automated processes. As seniors in the WKU Mechanical Engineering program, we were assigned the task of automating a drilling process at the General Motors Corvette Plant in Bowling Green. Currently, six holes are manually drilled into the rear fascia of the ZR1 Corvette. The fascia is the polymer mold that covers the rear of the vehicle, housing the taillights, license plate, and exhaust pipes. These six holes are used to attach the rear spoiler. It is our responsibility to automate this drilling process so that manual operator work is eliminated, and time and money are saved. Our presentation will cover the steps our team took to solve this problem. From conceptual design to fabrication and implementation, we will show how we engineered an efficient and effective solution. (page 16)

**Meador, Abby** Minor Incidents with Major Impacts: The Effect of Bottom-Up Incivility on Supervisors (Dr. Tony Paquin) Incivility within organizations is a rampant problem with dire consequences, including adverse effects on both

job satisfaction and psychological and physical states. The research will assess the effects of bottom-up incivility (a type of incivility that is directed from subordinates to supervisors) on supervisors' physical health, job satisfaction, and psychological health using hierarchical regression analyses. Data is being collected in a local healthcare organization through the use of online and paper-and-pencil surveys. Approximately 170 employees have completed the questionnaire. (page 19)

**Meadows, Stefan** Sounds of a Deteriorating Mind: The Use of Sound in *Narton Fink* (Dr. Ted Hovet) In Joel and Ethan Coen's 1991 film *Barton Fink*, sound is used to not only reinforce the visual and narrative elements of the film, but also to emphasize the mental anguish and increasing insanity of its titular character. This essay will delve into the film's sound design, focusing on the use of pitch and frequency, pace and rhythm, and sound as a signifier of mental and physical decay, as well as a tool for foreshadowing Barton's writers block. Excerpts from theoretical works on sound by Rudolf Arnheim, John Belton, Eisenstein, Pudovkin, and Alexandrov will look at the films' sound from a historical context, and research into the specific sound design of the film gives a clearer image of the technical ways in which the sound was used. (page 18)

**Mengo, Cecilia and Amy Cappicce** Social Work Department Study Abroad Programme in Kenya on Rural Mental Health Issues (Dr. Amy Cappiccie) As the need for a globally sophisticated workforce grows, the demand for study abroad programmes has emerged as one of the nine top trends in higher education (Dennis 2003, Lane 2003). Consequently there has been a 250 percent increase in the number of American students completing study abroad programmes in the last ten years (Institute of International Education Network 2005, Krisantas 2005). This project focuses on the development of a study abroad programme for WKU Social Work students to travel to Kenya to address mental health issues in rural areas. The challenge of meeting population needs for mental health interventions across a particular country faces all countries, but is most challenging in low income countries (Jenkins et al. 2010). Kenya has a growing recognition of mental health problems, a limited number of mental health specialists, and limited financial resources especially for mental health care. (page 13)

**Merriam, Anthony** Control Area Networks with the Freescale S12 Microprocessor (Dr. Michael McIntyre) The goal of the Control Area Network (CAN) S12 project is to create a platform for communication between a PC-based graphical user interface and an embedded microprocessor that can be expanded using the methodology of control area networks to add more devices. The user interface will be coded in C# while the embedded processor will be coded in a mixture of C and assembly. Data from the processor will be represented graphically on the PC and instructions sent to the S12 can be shown on a set of LEDs that are wired to the microprocessor. (page 16)

**Mikulcik, Kristen** See Sahi, Nilesh (page 21)

**Miller, Ben** See Vanderhoff, Sean (page 10)

**Miller, James** Men in the Kitchen (Dr. Michael Ann Williams) The kitchen and cooking in the domestic realm have long been the space and domain associated with women. Many of the popular male cooks on television are hyper masculine and many books marketed to men are also hyper masculine. There is, however, a growing number of men who are the primary cooks in their homes but do not fit these prevailing ideas of masculinity. This project focuses on the narratives of men who are the primary cooks in their homes though face-to-face interviewing. In this paper I explore the ways in which these men negotiate ideas of space, masculinity, and their relationships while occupying roles and activities not popularly associated with masculinity in our culture. (page 17)

**Miller, James** See Gaskin, Leigh (page 18)

**Miller, Tiffany, Courtney Keen, Cecily Carson, Shannon Minor, Charlie Richardson, and Krisstal Clayton** Consistency and Agreement Rates in Clinical Diagnoses (Ms. Krisstal Clayton) One in four Americans suffer from a psychological disorder (National Institute of Mental Health 2011). Some of those Americans are misdiagnosed and, therefore, do not get proper treatment. One reason for misdiagnoses is that clinicians have been known to disagree on what diagnosis best fits the symptoms (Hatchett et al. 2010, Youngston et al. 2008). This could be caused by various factors, one of them being the DSM-IV-TR (2000). The DSM-IV-TR has long been the source for diagnosing psychological disorders, and it has been frequently criticized for having classification errors, poor reliability, and poor validity (Baca-Garcia et al. 2007; Kendell and Jablensky 2003; McLauren 2007; Stinchfield 2003, 2005). The purpose of this research was to test the diagnostic consistency of clinicians, as well as agreement rates among clinicians with and without the use of the DSM-IV-TR. Clinicians were presented with eight, real case histories and given the task of choosing which diagnosis. (page 24)

**Millspaugh, Ethan\*** A Masterpiece of Propaganda (Dr. Karen Schneider) World War II, as a period in film history, provided American audiences with a number of memorable and important films; however, this period is also widely considered the Golden Age of Propaganda, an era in which a film's geopolitical symbols or political overtones often overshadowed its filmic techniques or plot. In this paper I examine Alfred Hitchcock's 1940 political thriller *Foreign*

*Correspondent*, which Nazi minister of propaganda Joseph Goebbels called “a masterpiece of propaganda which will no doubt make an impression upon the people in enemy countries.” By analyzing Hitchcock’s use of plot and visual imagery, I contend that *Foreign Correspondent* is actually a justification for the movement of American public opinion away from Western appeasement and towards American interventionism in the 20<sup>th</sup> century and beyond. (page 11)

**Minor, Shannon** See Miller, Tiffany (page 24)

**Moncrief, Josh and Daniel Moore** Doubt<sup>2</sup> = Confidence (Dr. Aaron Wichman) Doubt affects people’s behavior, thoughts, and feelings. In this study, we examined how doubt could affect doubt itself. Primary doubt or certainty cognitions were induced in participants, followed by a secondary activation of either doubt or certainty. Results indicated that secondary doubt weakened the impact of the primary cognitions, ironically showing greater certainty after two doubt inductions than just one. These findings suggest that under some conditions, people seem to be able to “doubt their doubt.” Through a clinical view, doubt seems to be an integral part of sanity, and its existence may offer a foothold for challenging cognitive distortions in therapy. (page 24)

**Morrison, Travis, Alex Berry, Kyle Moss, Phillip Womble, Melinda Whitfield, Tom Owens, and James Gantt** A Portable Community Infrastructure Resiliency System (Dr. Phillip Womble) Natural and man-made disasters can strike at anytime and leave entire cities without electricity. This was the foundation for the Portable Community Infrastructure Resiliency System (PCIRS). A team composed of members from Western Kentucky University, the West Virginia High Technology Consortium Foundation, and Murray State University developed a compact, lightweight electrical utility transformer, known as PCIRS, with a specialized communications package for rapid deployment in a disaster area. It includes an 800kVA lightweight power converter and the Manportable Interoperative Tactical Operations Center (MITOC), which provides a communications network for deployment and intercommunication of restorations services. (page 12)

**Morrow, Courtney** Testing Surface Integrity of Astronomical Telescope Mirrors through Specular Reflectance (Dr. Louis Strolger) Over time, the quality of a first-surface mirror steadily decreases. External forces, such as dust, weather damages, and surface scratches, affect its overall granularity, usually from a microscopic to a nanoscopic level. The specular reflectance of a damaged surface can be calculated, if the average size of the granularities are known. Conversely, we can determine the granularity size from the reflectance. The objective of this project is to calculate the size of the granularity using the specular reflectance on a test mirror and to confirm our results with the WKU NOVA Scanning Electron Microscope. The results of this experiment could provide a more accurate means of determining mirror integrity over time through scanning electron microscopy. (page 12)

**Nelin, Viktoria\*** The Proliferation of Vascular Smooth Muscle Cells Depends on Thioredoxin 1 Protein in a Model of Pulmonary Hypertension (Dr. Nancy Rice) Pulmonary hypertension (PH) is a disease without cure whose main marker is vascular remodeling due to the proliferation of pulmonary arterial smooth muscle cells (PASMC). The aim of our study was to find the role of the thioredoxin (Trx) system in hypoxia-induced proliferation in PASMC. We examined levels of Trx proteins in normoxia and hypoxia to find which and to what degree the proteins were expressed. We also ran proliferation studies to find how the two conditions affected PASMC proliferation. To find if Trx1 protein had a role in hypoxia-induced proliferation, we also knocked down Trx1 protein using a specific siRNA. We found that Trx1 levels were induced after 48/72 hours of hypoxia exposure, and that the Trx1 protein is necessary for the hypoxia-induced proliferation of PASMC. We speculate that Trx1 may represent a therapeutic target for PH. (page 21)

**Neuner, Rachel and Jeffrey Barefoot** Comparing the Acoustical Characteristics of a Multipurpose Room Utilized as a Classroom to Recommended Guidelines (Prof. Jeffrey Barefoot) Noise and reverberation negatively interfere with the ability of listeners to understand speech and effective teaching and learning in the school environment. The hypothesis for this study is that the acoustical characteristics of a university multipurpose room/ classroom will not comply with recommended guidelines. Excessive echo sounds and background noise have shown to interfere with the primary message intended for the listener, which can negatively affect an educational listening environment. Data was collected at the Suzanne Vitale Clinical Education Complex (CEC) at WKU. It is a multipurpose room used as for classes and guest lectures on a daily basis. The CEC is a recently constructed building that was first occupied in the summer of 2005. The collection of data included capturing energy time curves. (page 24)

**Newman, Veronica** Evolution of Video Games (Prof. Matt Tullis) The objective of my student research project is to create effective visual communication that centers on the evolution of video games. The result of this research is a three-panel collage and a written report that highlight the three major aspects of what makes video gaming fun and interesting for millions of people: the characters, the gaming systems, and the graphics. Each category will be hosted on its respective panel to showcase the affect they have in the video game industry. (page 20)

**Newton, Jonathan** Examining the Interstellar Medium for the First Stages of Stellar Formation (Dr. Steven Gibson) In galaxies like our own, the space between stars contains an interstellar medium (ISM) of gas and dust. The coldest,

densest regions of the ISM are potential sites of new star formation. Radio telescopes can detect and map these regions using 21 cm-line emission from atomic hydrogen (HI). We have developed an HI spectrum fitting program to identify cold HI emission regions. When applied to HI surveys from the Arecibo radio telescope, our method yields spatially coherent maps of gas temperature, optical depth, and other properties. To evaluate the algorithm's reliability, we ran Monte Carlo simulations of many HI spectra. We found that the biases in fitted values become worse for higher levels of noise, but our fits are mostly reliable for a S/N of less than 10. Unexpected opacity biases at low noise are under investigation. (page 15)

**Okwechime, Ifechukwude and Ritchie Taylor** Environmental Assessment and Monitoring Regime for Atrazine in Drinking Water for Kentucky (Dr. Emmanuel Iyegbuniwe) In the United States, atrazine's affordability and effectiveness in controlling weeds makes it the most commonly used pesticide and the most detected herbicide in drinking water wells. Exposure to this chemical has raised concern because research in animals and humans has revealed that there is the risk of chronic and debilitating illnesses occurring. This study describes the occurrence of atrazine in Kentucky's public water supply systems and assesses the typical monitoring regimes being employed. The objective of this study was to assess if current monitoring regimes are adequate in estimating atrazine levels of concern that may lead to human exposures with focus on the critical time of exposure. Data used was extracted from databases jointly developed by the EPA and Kentucky Department for Environmental Protection over a period of six years (2005-2010). Upon analysis of collated data, results indicated that public water supply monitoring regimes should be adjusted. (page 9)

**Oliverio, Myles** Tooley Cemetery of Monroe County, Kentucky (Dr. Darlene Applegate) Beginning in the late 19<sup>th</sup> century, the Tooley Cemetery in Monroe County has served as a visible record of this area's earliest historic period inhabitants. Unfortunately, natural processes and neglect have left this cemetery in a poor condition such that its cultural-historical significance was greatly compromised. Many headstones and stones marking graves have been lost, displaced or buried under the ground. The initial phase of my project involved clearing of thick underbrush, trees and saplings from the graveyard. To study the cemetery and its burial population, I used a variety of methods including surface surveying, sub-surface probing, mapping, archival research, and interviewing. By practicing archaeological stewardship and cultural resource preservation, the cemetery is now thoroughly documented, the past community is remembered, and the cemetery again serves as a vibrant resource for the current community. (page 24)

**Onwu, Cheryl\*, Cheryl Davis, and Aric Johnson\*** Preliminary Survey of Tick Vectors of Human Ehrlichiosis, Rocky Mountain Spotted Fever, and Lyme Disease in Warren County, Kentucky (Dr. Cheryl Davis) The Centers for Disease Control and Prevention list ten different tick-borne pathogens as established or emerging in the United States. Lyme disease, southern tick associated rash infection (STARI), human ehrlichiosis, anaplasmosis, and Rocky Mountain spotted fever (RMSF) are the most commonly reported tick-borne diseases reported in the southern U.S. The overall goal of the present study is to determine the prevalence of these tick-borne pathogens and their corresponding tick vectors in south-central Kentucky. A preliminary survey of ticks collected from a single location in Warren County was conducted between the months of April and June, 2010. A total of 288 ticks were collected with forceps and placed into plastic vials containing 70% ethanol. Three species were identified; 91.7% of the ticks were *Amblyoma americanum*, 6.6% were *Dermacentor variabilis*, and 0.35% were *Ixodes scapularis*. After identifying the species and sex of each tick, a Qiagen Q1Amp® Kit was used to isolate DNA. (page 14)

**Orndorff, William** See Wang, Kelin (page 10)

**Patel, Amar\*, Jenna Binion, Aaron McKee\*, Hemali Rathnayake, and Vladimir Dobrokhotov** Poly(3-hexyl thiophene) and Perylenediimide Functionalized Siloxane and Bridged-Siloxane Nanoparticles (Dr. Vladimir Dobrokhotov) Two types of electronically active siloxane and bridged-siloxane nanoparticles were prepared by base catalyzed hydrolysis and condensation of poly(3-hexyl thiophene) and perylenediimide derivatives. In both cases, the size of the particles was controlled by adjusting organotrialkoxy silane composition, molar ratios of base, and TEOS concentrations. The size, shape, and surface morphology of these functionalized particles were visualized using transmission electron microscopy. Their compositions were confirmed by ATR-IR, thermogravimetric analysis and elemental analysis. The photophysical properties of these nanohybrids were studied in solution phase and have further provided evidence of successful incorporation of poly(3-hexyl thiophene) and perylenediimide into siloxane core structure. (page 16)

**Patel, Khushbu\*, Andrew Allen, and Johnathan Whetstone** The Role of Lysine Specific Demethylase (JMJD2) (Dr. Rodney King) Chromosomal and histone proteins are subject to post-translational modifications such as methylation. The site and degree of methylation regulates the number of biological processes, while aberrant methylation can lead to human pathologies. The first aim of our research was to explore the role of JMJD-2 in lifespan and aging in *C. elegans* by conducting lifespan and pharyngeal pumping assay. Consequently, the role of JMJD-2 in reproduction and survivability was tested via brood count and embryonic lethality assay. The second aim of our research was to

create the necessary constructs to test the interaction of JMJD2 with non-histone proteins, specifically heterochromatin proteins (HP1) using genetic techniques such as point mutation via SoEing PCR. (page 11)

**Pawar, Shrikant** Statistical Analysis of Microarray Gene Expression Data from a Mouse Model of Toxoplasmosis (Dr. Claire Rinehart) Toxoplasmosis, caused by the protozoan parasite, *Toxoplasma gondii* is a major cause of morbidity and mortality in patients with AIDS and an important cause of miscarriage, stillbirth and congenital disease in newborns. The overall goal of the present study was to determine the impact of dietary supplementation with antioxidants on gene expression in the brains of non-infected mice and in mice infected with *T. gondii* using microarray analysis. RNA was isolated from the brains of C57BL/6 mice, and an Agilent Oligo Whole Mouse Genome Microarray (Agilent Technologies, Inc.) was performed. A total of 48 chips were normalized by Z ratios and the Data Driven Harr Fisch Normalization methods. Differentially expressed genes were identified by applying thresholds to identify significant values and the results were compared between the methods. (page 19)

**Peden, Wesley\*** Forks, Skewers, and Pins: Using Chess to Analyze “Sticky” Situations (Dr. Wieb Vandermeer) In this project I examine the similarities between three specific situations that commonly occur on the chessboard and in the real world: the pin, the fork, and the skewer. I explore the relationships between the game of chess and the game of life and determine if there are mutual strategies that can be applied to succeed in both mediums. (page 21)

**Perkins, Scott, Katie Brown, Lindsey Greco, and Steven Wininger** Personal Strategies for Increasing Exercise Intensity and Enjoyment (Dr. Steven Wininger) Two separate studies addressed the ability of participants to increase their exercise intensity and exercise enjoyment. Undergraduates served as participants for Study 1 (n=116) and Study 2 (n=149). Participants completed two 2-mile bouts on a treadmill for each study. Trial 1 consisted of exercising at a preferred exercise pace for two miles. After exercising participants were asked to identify a strategy for improving intensity in Study 1 and enjoyment in Study 2. A week later participants completed Trial 2, in which they completed two miles on a treadmill while implementing their strategies. Study 1 revealed that participants were able to significantly improve their two-mile times. The most common strategy was task relevant/motivational methods. Study 2 revealed that participants significantly improved their enjoyment and reduced their rate of perceived exertion even though they exercised at the same intensity. (page 13)

**Pile, Justin\* and Nilesh Sharma** Studying the Pathogenesis of Ulcerative Colitis Under the Influence of Plumbagin (Dr. Nilesh Sharma) Ulcerative colitis (UC) is an inflammatory disease of the large intestine characterized by inflammation and ulceration of its innermost lining. The effects of plumbagin were studied in the acute model of UC. The disease was induced in groups of C57BL/6 mice by DSS administration for seven days. A healthy control was maintained without DSS. The groups of diseased mice were treated with various plumbagin doses via drinking water for another seven days. Clinical symptoms and the size of isolated colon were recorded for comparison between experimental and control groups. Experimental groups demonstrated significant improvement in disease index. Excised colon pieces were processed for histopathological examination. Experiments are underway to measure the various inflammatory markers that are upregulated under conditions of ulcerative colitis. (page 21)

**Powers, Michael** Ion Selectivity Studies on the Mineral Cavansite (Dr. Aaron Celestian) The name cavansite is derived from its chemical composition, calcium vanadium silicate, and commonly occurs as a secondary mineral in igneous rocks like basalts and andesites. It is frequently found sitting atop a variety of zeolite minerals, which gives insight into its porous zeolitic structure. These types of structures have the potential to sequester hazardous chemical byproducts due to their very high ion selectivity. During synthesis and various ion exchanges, changes to cavansite's structure and chemical composition were determined by using a combination of Raman microscopy, X-ray diffraction, and DSC/TGA for phase and structural analysis to determine the mechanisms of ion selectivity. (page 23)

**Poynter, Amy** See Martin, Virginia (page 22)

**Price, Buddy** See Conn, Marvin (page 16)

**Price, Daniel, Ian Blaylock\*, Celena Allen, Brenna Tinsley\*, Jennifer Thurmond, Jon Zambrano, Martha Caudill, T.J. Mann, and Kristin Smith** Economic and Social Implications of Peak Energy (Dr. Cari Bourette) In 1956, M. King Hubbert published his research on the subject of peak oil. Based on this work and subsequent research and discussion, it would appear that the world reached a global condition of peak oil production in 2005 (as determined by the International Energy Agency in 2006). The impacts of such an event have been projected by Duncan and Tainter, who suggest that this energy peak will lead to severe economic contraction. Any economic occurrence of such magnitude would have ramifications that have the potential to result in a social collapse not unlike those studied by Diamond. By compiling all of the implications of the aforementioned works, we describe an interplay that may result in major changes for which we are currently unprepared. (page 16)

**Rader, Shelby\*** Synthesized Crystalline Materials and Ion Exchange (Dr. Aaron Celestian) The primary goal of my study is to synthesize and quantify porous crystalline materials, specifically to determine the behavior of selected ions



when exposed to these materials. The structure and chemical composition of these engineered products were determined by using a combination of Raman spectroscopy and X-ray diffraction (XRD) patterns. This unveils the complex mechanism that makes ion exchange so easy and allows for simple chemical alterations to improve the synthesized products. Ion exchanges are carried out in-situ in order to attempt to understand the controls of the processes involved in ion exchange, in hopes of developing new, novel materials. (page 22)

**Ramsey, Christopher** The Green Revolution: Iranian Dissidents (Dr. Scott Girdner) The Green Revolution, a reaction to suspected election tampering in the Iranian national elections of 2009, is viewed by many observers as a groundbreaking phenomenon in Iranian politics. According to current Iranian government purview, such popular demonstration, in defiance of official government business, is punishable by death. The question becomes, what would possibly motivate such a seemingly loyalist populace to break ranks with their religious and governmental authority and risk death to make a statement? My research will examine the causes and effects of such an uprising and explore the motivations and rationalizations of both the dissident movement and the established religious authority. (page 15)

**Rapolu, Chaitanya, Dhatri Ravipati, and Kevin Williams** Inhibition of the Enzyme Papain by Analogs of the Anticancer Drug Cisplatin (Dr. Kevin Williams) We are investigating the interaction of a series of platinum complexes with the enzyme papain, a digestive enzyme. These platinum complexes are structural analogs of the anticancer drug cisplatin. Papain has both a cysteine and a histidine residue in the active site; both amino acids are potential targets for platinum complexes. Commercial papain has the cysteine partially inactivated, and thus excess cysteine must be added for full activity. We have found that the addition of cysteine and subsequent dialysis can influence the inhibition profile of our platinum complexes. (page 14)

**Ravipati, Dhatri** Inhibition of Subtilisin by Analogs of the Anticancer Drug Cisplatin (Dr. Kevin Williams) We are investigating the inhibition of the digestive enzyme subtilisin by analogs of the anticancer drug cisplatin. These platinum complexes can potentially inhibit subtilisin by interacting with the histidine residue of the active site; thus, the inhibition can be a means of probing for site-specific reaction of a platinum compound with a particular protein. We are investigating how the size, shape, and relative reactivities of the platinum complexes affect the rate and extent of enzyme inhibition. (page 10)

**Ravipati, Dhatri** See Rapolu, Chaitanya (page 14)

**Reed, Deborah** Control of Rabies in the Pet Population is Critical to Human Health and Safety in the Community (Dr. Emmanuel Iyegbuniwe) Patients checking in for care at the Christian County Health Department in Hopkinsville, Kentucky were surveyed to assess the reasons pet owners do not have animals adequately vaccinated against rabies. A total of 89 surveys were returned. Almost 15% of the respondents were unaware that rabies was a real threat to the health of their family. While 47% of the respondents cited economic reasons for not having their pets vaccinated, and 82% of them said that none of the barriers discussed presented any problems in getting their pets vaccinated against rabies. In conclusion, survey respondents do not demonstrate knowledge of the importance of rabies vaccination and thus do not vaccinate pets adequately. Educational and promotional programs are necessary to influence the pet-owning public to have rabies vaccines administered to their animals. (page 13)

**Reinscheld, Thomas** See Jennings, John (page 15)

**Renfro, Seth** See Hinson, Kevin (page 16)

**Richardson, Charlie** See Miller, Tiffany (page 24)

**Rizzo, Ron** See Wilson, Jenna (page 15)

**Roberts, Austin** Emergency Medical Response Units: A New Era in Disaster Relief (Prof. Travis Wilson) Designing for emergency relief has gained international interest with the magnitude of natural disasters and the world's inability to provide adequate medical services. This project focuses on the design of medical units utilizing Intermodal Steel Building Unit shipping containers. The units are designed with the main advantages of high quality, high energy, high volume, and mobility. The quality will equal or exceed that of a U.S. emergency room facility with the proper material selection and physical layout of each prototypical unit. The designs focus on ease of access to equipment and supplies for an emergency response. Reducing human circulation distances while creating compact working environment are paramount to effective emergency medical design. (page 24)

**Rogers, Mallory** See Ayers, Claci (page 23)

**Sadler, Suzanna\*, Schuyler Wolff\*, and Andrew Gott** Tests of Environmental Effects on Type Ia Supernova Production (Dr. Louis Strolger) The host galaxy environments of type Ia supernovae provide our best opportunity for constraining the mechanism(s) of the SN Ia progenitor system (the stars involved, the incubation times, and the sensitivity of SNe Ia to changes in the local gas-phase metallicity). We seek to solidify possible environmental trends

in SN Ia rates from direct measures of host galaxy properties, using the sample of approximately 40 SNe Ia collected by the Nearby Galaxies Supernova Search project. This on-going study tests the influence of several variables on SN Ia production efficiency: parent population age, rate of star-formation, and metallicity. The complete sample will provide a validity test of the mostly indirect trends being established for SNe Ia from other surveys, and may ultimately steer future investigations towards more precise SN Ia cosmology. (page 12)

**Sahi, Nilesh\*, Sumit Batra, Kristen Mikulcik, Heather Shockley, Camille Turner^, Zachary Laux^, and Vivek Badwaik** Novel Purification Protocol for Heparin Binding Proteins: Relevance in Biopharmaceuticals (Dr. Rajalingam Dakshinamurthy) The progression of using biomolecules found in humans, such as proteins rather than synthesized organic molecules, has had a positive impact in the biopharmaceutical field. This has led our lab to develop a new cost-effective and efficient purification method compared to the currently available methods for heparin binding proteins. Heparin binding proteins consist of a plethora of protein families, but the most important family is the fibroblast growth factors (FGFs). In most heparin binding protein purification protocols, it is common to collect the protein through conventional heparin column chromatography, which has many disadvantages and results in higher cost for production of recombinant proteins. However, our new method reports efficient off-column purification of FGF-1 from soluble fractions and purification of insoluble inclusion bodies like the FGFR using a weak amberlite cation (IRC) exchanger. (page 21)

**Sanders, Kyle** Bosom Buddies: How Edgar Allan Poe and Roger Corman Became a Match Made in Heavenly Hell (Dr. Sandra Hughes) An author such as Edgar Allan Poe sets a distinctive mood, be it with poetry or various short stories. When it comes to adapting Poe's works to film, the director has the task of not only capturing that mood, but extending it to a 90-minute production. This research paper discusses Poe-related films directed by the "King of the B-Movies" Roger Corman, and analyzes the films' successful adaptations from page to screen. Corman produced/directed a cycle of films loosely inspired by the works of Poe, including *The Masque of the Red Death* (1964). Using an excess of visually lavish sets, Corman created a "nightmarish world of melodramatic fantasy," for which Poe is highly noted. Noting key theories in film, especially in the horror genre, my paper examines the filmic factors that contribute to the mythic aura of Edgar Allan Poe. (page 17)

**Sanford, Joshua\*** See Varajic, Benadin (page 21)

**Sangoi, Tejas^ and Lakshmisri Vangala** Green Synthesis and Characterization of Metallic Nanoparticles using Starch from Potato (Dr. Rajalingam Dakshinamurthy) Plants synthesize glucose and store it mainly in the form of starch in plastids such as amyloplasts. These starch granules are stored in the various parts of the plant like tubers, fruits, seeds, and roots for further use. Here we report the green synthesis of metallic gold nanoparticles (GNPs) from the starch extracted from potato. The nanoparticles have been synthesized using the bioreduction properties of starch on the chloroaurate anions in aqueous solution, at room temperature and at atmospheric pressure. The characterization of synthesized gold nanoparticles by different techniques indicates the formation of spherical, pure metallic gold nanoparticles in the size range of 5-20 nm. This method provides new chemical, catalytic and biomedical application opportunities to previously inaccessible realm. (page 23)

**Schaefer, Rebecca\*** Exploring the Relationship between Facebook, Face-to-Face Communication and Intercultural Communication (Dr. Larry Caillouet) My research project seeks to explore and examine the effects of Facebook on communication between American and international students. The use of social media as a means to communicate with others is increasing at an amazing rate. Facebook has become my generation's favorite way to communicate with friends and family and "Facebook" has unofficially become a verb that many college students use. While social media such as Facebook, Linked-In and email may encourage American college students to communicate with international students beyond the perimeters of the classroom and campus, it seems that Facebook is on the way to becoming a substitute for face-to-face intercultural interactions. Whether it will enhance or diminish the extent and quality of intercultural communication is an important question to be studied. (page 15)

**Scherzer, Tracy\*, McKenna Byerley, Anna Agisilaou, Emily Heeb, and Sarah Franklin** Helping Those Who Are Dedicated to Helping Others: A Campaign for the IRHDR (Prof. Kenneth Payne) We are doing a public relations campaign for the Institute for Rural Health Development and Research (IRHDR), a non-profit organization located in the Academic Complex on WKU's main campus. The goal for this campaign is to increase IRHDR's opportunity to receive grants by implementing a health literacy program that will increase the institute's educational and research components. We have devised various tactics to fulfill our goal statement and will evaluate the success of our campaign upon completion at the end of March. This campaign is preparing us for public relations careers following graduation. (page 18)

**Schieber, Natalie^** See Fugate, Elizabeth (page 14)

**Schrader, Sarah^** Genomic Analysis of TT9, a Novel Mycobacteriophage (Dr. Rodney King) Bacteriophages are ubiquitous on earth, and yet very few types have been characterized. The objective of this experiment was to isolate

and characterize a novel bacteriophage from the environment. *Mycobacterium smegmatis*, a harmless bacterium commonly found in soil, facilitated the enrichment and recovery of mycobacteriophages. A single phage type was purified to homogeneity and was named TiroTheta9 (TT9). TT9 genomic DNA was isolated and sequenced. The sequenced genome was annotated and compared to the genomes of other mycobacteriophages. We conclude that TiroTheta9 is a unique mycobacteriophage with close similarity to mycobacteriophages of the A4 subcluster. These results extend our understanding of mycobacteriophage diversity and contribute new information to the growing database of annotated phage genomes. (page 12)

**Schreiner, Madalyn** Exposing the Cracks in the Masks (Dr. Ted Hovet) In 2008, Christopher Nolan's *The Dark Knight* mesmerized film audiences with its complex story. The movie expanded the lore of Batman into a platform for social commentary, expressing views about privacy protection, corrupt law enforcement, and basic human morality. These issues strengthen Nolan's larger exploration of the righteousness of *The Dark Knight's* main characters, Batman and the Joker. Presenting comic figures as imperfect humans, the film portrays them as having all the wounds and ambitions that we viewers might possess. We empathize with each character and struggle to define either one as completely heroic or villainous. This essay will use research into the film and its influences to study the motivations of the two characters and to analyze factors affecting audience views of heroes and villains. It will argue that it is Batman's unwavering hope for humanity and the Joker's lack of hope that finalizes viewer's archetypal classifications of hero and villain. (page 11)

**Schuck, Julie** Myths of Mortality (Prof. Laurin Notheisen) My work is primarily narrative. I enjoy telling the stories that I learned as a child. Mythology and folktales are especially powerful sources of imagery because these stories are simple enough to be told quickly, but complex enough to communicate multiple meanings. Recently, I have been exploring themes concerned with mortality, that brief time we spend in frail and vulnerable bodies. Norse, Greek, and Mayan mythologies all tell of the tension between the gods and humanity as they struggle to decide how to best use this limited resource. I am inspired by the work of William Blake and Akseli Gallen Kallela, two artists who explored mythological, religious, and folklore imagery in their work. Their visual vocabularies were highly personal, but their images successfully engage viewers from very divergent backgrounds and traditions. (page 20)

**Selby, Jason** See McPeak, Ryan (page 16)

**Sellers, Hannah** Adaptive Re-Use: Anthropologie Wedding (Prof. Laura Leach) Throughout downtown Louisville, various historic buildings serve a variety of different people; however, each acts as its own piece of art to the gallery that the city displays. Whiskey Row, one of Louisville's most famous historic districts, houses seven endangered buildings that are in need of renovation. Designed by architects Henry Whitestone, John Andrewartha, and D.X. Murphy, the historic row of buildings dates to the late 1800s and early 1900s. My research regarded architectural history, purpose, structure, building code, geographical location, and overall future vision for the space of selected buildings. Louisville houses many clothing companies, distilleries, wedding warehouses, and barn stables with an eclectic mix of architectural elements. (page 12)

**Shannon, Sean\* and Ajay Srivastava** Identification of Candidate Basement Membrane Degraders Using *Drosophila* Genetics (Dr. Ajay Srivastava) Metastasis is a devastating development during tumor progression, often resulting in a tragic decline in life expectancy for afflicted individuals. Degradation of basement membrane (BM) plays a significant role in tumor metastasis, but precisely how tumors are able to break through BM is not fully known. Various matrix metalloproteases (MMPs) are known to be upregulated in invasive tumors and involved in BM degradation, however clinical trials involving MMP inhibitors have shown little success. This suggests a complex process of BM degradation that may involve a variety of factors including MMPs. Utilizing genetic techniques in *Drosophila* we have identified several candidate genes that may regulate BM degradation. These candidate genes will be further examined to determine if they play a role in BM degradation by tumors. (page 21)

**Shockley, Heather** See Sahi, Nilesh (page 21)

**Silver, Adrianna** Ambiguity in the Truth of Art: Heidegger's *The Origin of the Work of Art* (Dr. Adrian Switzer) This paper explores the defining qualities of art through Heidegger's essay, *The Origin of the Work of Art*. Heidegger presents an idea of art and poetry that hinges on the idea of new experience. *The Origin of the Work of Art* is not an attempt at defining art per se; rather, Heidegger attempted to find a way of seeing in a completely new way that necessitates the poetic nature of the truth of art. Starting with the basic "thing" and moving into the work of art itself, Heidegger explains the truth of the work of art that exists independently within itself, and is only hindered when approached with definite meaning. Through an explanation of the material quality, openness, and lack of definition of the nature of the work of art, I will explain why Heidegger insists on ambiguity in the truth of art. (page 18)

**Simmons, Sara** See Ayers, Claci (page 23)

**Simms, Traci** How *Slaughterhouse-Five* is an Anti-War Novel, or Why a Pillar of Salt Wrote a Novel about the Fire-Bombing of Dresden (Dr. Ted Hovet) Kurt Vonnegut's novel *Slaughterhouse-Five* has constantly been referred to as an anti-war novel. This essay analyzes in what ways Vonnegut's novel makes an anti-war statement and why he chose to write a novel with this particular statement. It uses research to demonstrate how Vonnegut's own experiences in the war influenced his writing of the novel and the significance of his own appearance as a character within the pages of his story. The essay also analyzes the outlandish elements of aliens and time travel and how they relate to Vonnegut's message on the negative effects of war. (page 18)

**Simouth, Christopher** See Ferguson, Jack (page 22)

**Simpson, Michael, Kyle Moss, Phillip Womble, Thomas Owens, and Melinda Whitfield** Waterborne Threat Interdiction with Underwater Impulse Generation for Coastline Defense (Dr. Phillip Womble) The United States currently maintains 361 ports along 95,000 miles of coastline. The U.S. Coast Guard, unsatisfied with current coastline defenses, initiated the Maritime Domain Awareness program to increase the security of U.S ports. To fulfill this need, Western Kentucky University and the West Virginia High Tech Consortium Foundation have developed an acoustic impulse generator to interdict underwater intruders and disrupt hostile equipment. The technology uses a highly-collimated acoustic wave (moving at 1500 meters per second in water) to deter underwater threats and allows coastline security to respond over large distances with little warning. The National Institute for Hometown Security and the U.S. Department of Homeland Security sponsored the development of the acoustic transducer. (page 16)

**Sinderbrand, Carly and Bruce Schulte** Examining the Dominance-Stress Hypothesis in the Domestic Horse (*Equus caballus*) (Dr. Bruce Schulte) Maintaining a dominant position in a social group requires a high rate of aggressive displays that are associated with elevated stress hormone levels. This study examines the stress of dominance hypothesis using the domestic horse as a model. Another component considered in this study is changes in the reproductive state of females, which can lead to a shift in hierarchy position. No significant differences were found between the cortisol levels of dominant and subordinate animals, nor were there differences in their activity behaviors. We also found no differences in the activity behaviors and cortisol levels of lactating and non-lactating females. Our findings do not support the dominance-stress hypothesis and indicate that there is little difference in the activity behavior of dominant and subordinate animals in this domestic situation. (page 10)

**Singh, Shalini and Shailesh Advani** Emerging Patterns of Emergency Department Use among Residents of Midwestern States (Dr. William Mkanta) The passage of the Emergency Medical Treatment and Labor Act (EMTALA) has led to a growth in emergency room visits by 26% between 1993 and 2003. A study conducted by IOM revealed more than half of all the emergency care in U.S. is uncompensated. This study focuses on emergency department (ED) visit patterns in the Midwestern states of Iowa and Nebraska. Factors relevant to ED visits, such as age, gender, length of stay (LOS), and admission status, were investigated. The findings showed mean age for all ED patients was 38 years, whereas that of patients who were admitted as a result of ED visit was about 60 years. Payer information for ED services indicates less than 60% of the elderly were covered by Medicare. For this reason, an increased portion of uncompensated ED care delivered to the elderly population has the potential to add financial stress to the already overburdened emergency services. (page 13)

**Singh, Shalini** See Bhattarai, Alka (page 19); Chavan, Prachi (page 9); Damera, Venkata (page 13)

**Skinner, Andrew** Family Recreation Facility (Prof. Laura Leach) This research project involved the development of a design for a family recreation facility to be located in Bowling Green, Kentucky. The facility would include recreation activities such as batting cages, miniature golf, go-karts, and arcade games. In developing a plan for this facility, research was conducted into regulations for construction in the Bowling Green area, spatial and functional requirements for this facility, and the various construction materials available. Green and sustainable elements were incorporated into all facets of the design. The finished product provides an iconic building design utilizing passive heating, energy saving techniques, and other green technologies, ensuring sustainability of design and a positive family experience in Bowling Green for years to come. (page 16)

**Slaven, Amber** You Think It, I Ink It: The Tattoos of Tim Phelps (Dr. Timothy Evans) Tattooing provides a unique look into the aesthetics of both the tattoo artist and the person receiving the tattoo. Like any other profession, tattooing provides a range of skills, preferences, and attitudes of the tattooist. Tim Phelps, a local tattooist and owner of Age of Reason Tattoos, creates expertly designed and tattooed pieces of art. Utilizing my fieldwork with Phelps, I intend to present tattooing as an aesthetic, a medium crafted on to the body that reflects the skills, personal expression, and context of a tattoo artist. This will also be in conjunction with a broad view of the greater tattooing community. (page 17)

**Slocum, Donald** See Jennings, John (page 15)

**Smiley, Shawn, Claire Rinehart, and James Forshee** Determining the Locations of Mycobacteriophage Promoter Sites Using a Data Filtering Program (Dr. Claire Rinehart) Three mycobacteriophages (Backyardigan, Peaches, Wizard007) have been sequenced, assembled, and their genes annotated. This project used known mycobacterium promoters to train a Markov model to find mycobacteriophage promoters. We have identified promoters containing -35 and -10 domains for the three bacteriophages. These results compare the locations of the promoters within the three bacteriophages. (page 22)

**Smith, Keaton<sup>^</sup> and Daniel Dilger<sup>^</sup>** Form Evaluation Using Lexmark MFD Platform (Dr. Uta Ziegler) This presentation outlines a project investigating how to increase the capabilities of Lexmark multi-functional devices (MFDs), specifically to automatically evaluate Scantron-style forms. The solution consists of two parts: MFD software to evaluate forms and a configuration program for personal computers. Difficulties were encountered in the unpredictability in the order in which filled areas are found, distinguishing text from and assigning meaning to such areas, and the issues that came with working with a new platform. Filled areas on a form are found by applying a flood fill algorithm to a scanned image of the form. Meaning is assigned to this data according to a user-created template XML file. The user can then scan forms to be compared to this template; the information extracted is then output to a text file on a USB drive. (page 15)

**Smith, Kristin** See Price, Daniel (page 16)

**Sobon, Casey** ATV Robot (Dr. Stacy Wilson) An autonomous robot has been created on an ATV platform to be used to move a microgravity meter through hostile terrain and take measurements to uncover voids in the ground. This project has been ongoing since 2006. From that time many modifications have been made and the overlapping design has compromised the control integrity. The goal of this project is to re-engineer the control system of the robot. The new system will allow a user to control the speed and direction of the ATV through remote with much more precision and safety than before. The presentation will include a discussion of the development of the robot, problems with the present system, proposed solutions to the engineering problems, and results of the new design. (page 12)

**Sowell, Dewayne, Drew Bewley, and Jay Hart** Use of Technology for the Preservation of Resources in African Villages (Dr. Mark Cambron) Currently small farming village communities in rural Africa are losing a significant percentage of their agricultural yield to consumption and destruction by both roaming parades of elephants and local, resident wildlife. Traditional methods of deterrence through direct human intervention with confrontation have proven dangerous and often ineffectual against smaller animal due of lack of detection. The purpose of this project is to develop a multi-tiered approach to deter potentially harmful wildlife activity in the rural farming communities in impoverished African regions. To do so, the objective is to protect both crop yields and human welfare through non-lethal territory denial with multiple animal-sized "intelligent" collars and from static and reactionary ground-based systems. (page 12)

**Spurgeon, Kyle** Louisville Metro Fire Station Dixie Highway (Prof. Laura Leach) Louisville Metro Fire Department will fill a great need for a fire suppression service in the Dixie Highway area. I have always held fireman in the greatest regard. I have been extremely involved in my community through my fraternity and have seen the things that firemen do to help and improve their communities. It is important that they have the facilities to foster great results. I conducted research to find the wants and needs of the average fireman when it comes to function and design, what they need to have in an emergency situation, and what they want around when not responding to emergencies. I researched all of the necessary equipment required, as well as spatial relationships in terms of what areas need to be placed close together for convenience and what areas do not. I then matched these with the building codes and regulations, site development, and special needs of the firemen. (page 17)

**Stanam, Aditya and Gasana Janvier** Epigenetics and Asthma in Children: A Review (Dr. Christine Nagy) Asthma is a chronic inflammatory disorder of airways, the manifestation of which depends on complex interactions of environmental exposures, genes, epigenome, immunologic mechanisms, and inflammatory mediators. The field of epigenetics has been providing some conclusive and consistent evidences in explaining causal relationships between environmental triggers, epigenetic changes and asthma. Epigenetics is the study of heritable changes in gene expression that occur without directly altering the DNA sequence. A comprehensive search of literature dated 1970-2010 was conducted using key words "epigenetics," "asthma," "allergy," and "children" using Pub Med, Highwire, and Google Scholar. A study done by Haberg et al. (2009) examined the relative risk for children exposed to folic acid supplements, which act as methyl donors. (page 13)

**Steele, Chris, Ben Topp, and Matt Bracken** Bio-Generated Greenhouse Heating System (Dr. Kevin Schmaltz) In the United States there are many needs for abundant clean energy. Though composting waste may not be used on a large scale, it certainly is an innovative idea for harnessing energy that would otherwise be lost. The goal for the Greenhouse Composting Project was to look at the feasibility of using the heat created from decomposing material to heat the root zone of the plants that are housed in the WKU Greenhouse during the winter months. This would result in a severe cut in energy cost. The WKU Agriculture Department is contracted to dispose of the city of Bowling

Green's leaf collection, which it, in turn, sells to local farmers for fertilizer once the leaves break down. Since the decomposing process produces heat, we considered ways ideas for capturing and utilizing this energy. The idea for harnessing this energy was to place the decomposing material on top of a large concrete pad that contains a network of pipes with water serving as the means of absorbing, transporting, and radiating heat in the WKU Greenhouse. (page 15)

**Stephens, Shelby**<sup>^</sup> See Cooper, Anthony (page 23), Stephenson, David (page 23) and Wittman, Rebecca (page 20)

**Stephenson, David, Anthony Cooper\*, Paul Fleischmann<sup>^</sup>, Shelby Stephens<sup>^</sup>, and Rebecca Wittman** Men Let It Go, Women Talk It Out: Gender Differences in Coping with Stress (Prof. Andrew Mienaltowski) College freshmen were given ten scenarios, each including a different problem likely to occur in the first year of college, and 28 coping strategies. The findings suggest that women are more likely than men to cope by seeking emotional support from peers. Women also are more likely to seek advice when presented with a problem, as well as being more likely to vent. Men, on the other hand, are more likely to use denial and humor to cope. Another finding is that women are more likely to be depressed. The lower rate of depression in men may be due to the use of denial as a way of dealing with a problem. Men do not actively think or talk about a problem like women do because they deny it exists; therefore, men do not show as many signs of depression because the problem does not have as much of an effect on their lives. (page 23)

**Stephenson, David** See Wittman, Rebecca (page 20)

**Stewart, Colleen\*** Reporting on Women in Sustainable Agriculture (Prof. Mac McKerral) Women are farming. Current trends in the reorganization of farm work, as well as the rise of environmental and sustainability concerns, are redefining gender roles on the farm. My research started in India where farmer suicides sweep the nation and widowed women are beginning to farm independently. In Belize, women are farming more, too, and the Ministry of Agriculture awards a Woman Farmer of the Year. In the U.S., the number of total people farming is going down, but each year, the number of female farmers is on the rise. Women are starting to farm independently, and sustainably. Women are growing food on a smaller scale and oftentimes without chemicals and pesticides. Agriculture is empowering women to empower their communities and change the way our world eats and operates. (page 18)

**Still, Barbara<sup>^</sup>** Atmospheric Reflection (Dr. Louis Strolger) We will examine the reflected emission from the Earth's mid-range to upper atmosphere using a high altitude stratospheric balloon. We will be looking at three different wavelengths of light as the balloon travels through the atmosphere: near-ultraviolet, visible, and near-infrared. Two payloads will be used, one containing light sensors collecting broad illumination information and humidity, the other containing a spectrometer collecting specific irradiance in regular time intervals. We will test atmospheric reflectance within the troposphere and stratosphere, and compare our measures to any previous data or theoretical expectations. Future experiments may track long-term reflectance of the Earth's atmosphere, either growing in strength, staying the same, or weakening over time. (page 22)

**Still, Barbara<sup>^</sup>** See Gaulle, Owen (page 22)

**Sun, Huifang** See Wang, Yajie (page 10)

**Surina, Alyssa** Private Education Market in China: Turbo-Charging Economic Growth (Dr. Michelle Trawick) Returns to education investment for developing countries are higher than returns to physical capital, and returns to private spending on education are higher than to public spending. During economic reforms, China prioritized educational reform as a central program of its economic development. By focusing on science and technology education, and by allowing private supply of education services, China's workforce increased in skill level and wages, and overall economic growth has remained high. It was the historic reforms placing private education, as well as science and engineering education, at the center of economic policy that boosted the economic opportunities brought by high foreign investment. (page 17)

**Tabor, Stephen\*** Perceptions of Theatricality Embedded in Staging *The Spitfire Grill* (Prof. Tracey Moore) My thesis in my Musical Theatre and Directing majors seeks to determine how the staging of a musical production normally produced in a proscenium space affects the audience's perception of theatricality when staged in a thrust setting. Using *The Spitfire Grill* as my primary source of research, I will prove or disprove the dramatic theory surrounding ideas of increased audience perception of theatricality within the thrust staging of a nontraditional musical. (page 11)

**Theiss, Eric** Lambda Chi Alpha Fraternity House (Prof. Laura Leach) For my research project I chose to design a new residence for the Lambda Chi Alpha fraternity at Western Kentucky University. As a member of Lambda Chi Alpha, I have good understanding of what necessary aspects are needed for an efficient fraternity house design. I contacted current and past members of Lambda Chi Alpha, as well as the chapter advisor, getting feedback and ideas for the new house design. Each member expressed interest in a volleyball court, such as at the current residence, which I kept in mind in the design. I also considered surrounding buildings and campus architecture in the

design. My Greek Revival design illustrates to the surrounding community and the brotherhood aspect of Lambda Chi Alpha while incorporating a volleyball court. (page 15)

**Thomas, Jennifer\*** See Vonderschmitt, Kaitlin (page 23)

**Thompson, Helen, Chris Anbresse, Eric Vanover, Rui Zhang, and Yan Huang** A Novel Photosynthesis of Trans-dioxoruthenium(VI) Porphyrins (Dr. Rui Zhang) The trans-dioxoruthenium(VI) porphyrins have been developed as a well-characterized model system for heme-containing enzymes. A new photochemical method to synthesis the trans-dioxoruthenium(VI) porphyrins has been successfully developed. The dichlororuthenium(IV) complexes are prepared by refluxing corresponding ruthenium(II) carbonyl complexes in  $CCl_4$ , followed by counterion exchanging with  $AgClO_3$  to form the corresponding porphyrin-ruthenium(IV) dichlorates as photo-labile precursors. Photolysis of porphyrin-ruthenium(IV) dichlorate complexes with visible light results in hemolytic cleavage of the O-Cl bond in the chlorates to give trans-dioxoruthenium(VI) species. The generality of this method was demonstrated by the generation of the trans-dioxoruthenium(VI) porphyrins. (page 21)

**Thurmond, Jennifer** See Price, Daniel (page 16)

**Tinsley, Brenna\*** See Price, Daniel (page 16)

**Topp, Ben** See Steele, Chris (page 15)

**Travis, Hayley** See Duke, Emily (page 15)

**Tsao, Wan-Ting** Graphics: An Innovative Approach Used to Improve the Professional Knowledge of Management and Technical Management Foundation Course Based on Industrial Needs (Dr. Mark Doggett) Management can be defined as a series of organizational possessions and activities. Management also can provide the effective way to achieve organizational goals to help managers lead the company successfully. According to the classical methods of management, dynamic, system-oriented, human-oriented, and passive are important for helping a company analyze the knowledge of management. On the other hand, to establish knowledge and business performance through product and processes are important for a company. In addition, I will present the purposes, knowledge and methods of management and technical management, and how people could make use of that approach. (page 14)

**Tucker, Joyce^** See Howard, Ben (page 16)

**Turhan, Nezihe** Dynamic Programming on Non-Periodic Domains (Dr. Ferhan Atici) In this talk, we begin with some characteristics of non-periodic domains. Then we introduce a general form of maximization problem posed in terms of infinite sequences with a given constraint on non-periodic domains. In addition, we talk about the Bellman equation discovered by Richard Bellman in the 1950s and give a necessary condition for optimality. We discuss the solution of the Bellman equation and how this solution attains its maximum. Finally, an example of a maximized utility function on non-periodic domains will be given. (page 9)

**Turner, Camille^ and Christopher Carmichael** Synthesis and Characterization of MOF-5 (Dr. Bangbo Yan) MOFs are crystalline compounds consisting of metal ions or clusters coordinated to often rigid organic molecules to form one-, two-, or three-dimensional structures that can be used for the storage of gases such as hydrogen and carbon dioxide. This project focuses on the exploration of the synthetic conditions of MOF-5. We have investigated a number of parameters that affect the crystal growth of MOF-5 under solvothermal conditions. (page 23)

**Turner, Camille^** See Sahi, Nilesh (page 21) and Vakiti, Raj Kishore (page 19)

**Tyree, Whitney** See Huff, Amanda (page 17)

**Vakiti, Raj Kishore, Christopher Carmichael, Camille Turner^, Yan Cao, Hou-Yin Zhao, Wei-Ping Pan, and Bangbo Yan** Metal-Organic Frameworks with High Carbon Dioxide Adsorption Capacity (Dr. Bangbo Yan) Carbon dioxide removal from flue gases of power plants is critical for reduction of greenhouse gas emissions implicated in global warming. Metal-organic frameworks have promising potential applications in carbon dioxide capture due to their unique structural properties such as high porosity, high thermal stability and high adsorption capacity. In this work, we will present the investigation on the structural thermal stability of a Cu-BTC (Copper benzene-1, 3, 5-tricarboxylate), a metal-organic framework, at different temperatures and also in presence of vacuum. The weight loss of the Cu-BTC due to removal of some water molecules at different temperatures and at different time duration was studied using thermogravimetric analysis. Carbon dioxide and nitrogen adsorption of Cu-BTC was also studied using thermogravimetric analysis. (page 19)

**Vance, Kaleigh** See Ayers, Claci (page 23)

**Vanderhoff, Sean, Jason Polk, Chris Groves, Ben Miller, and Carl Bolster** Assessing Groundwater Vulnerability and Epikarstic Transport of Organic Soil Amendments during a Major Storm Event in South-Central Kentucky (Dr.

Jason Polk) Groundwater in agricultural karst areas is susceptible to contamination from soil amendments and pesticides. A dye trace was initiated using sulphorhodamine-B during a major rain event in a known groundwater recharge area where manure was applied to the ground. Water samples and geochemical data were collected every four hours before, during, and after the storm to track the transport and residence time of the epikarst water and organic soil amendments during high flow condition. The data show a rapid epikarstic response to the rainfall event, with changes in geochemistry indicating meteoric water moving through the cave rapidly and transporting bacteria from epikarst storage. The results indicate that significant precipitation events can rapidly impact the pathways and timing of contaminant transport through the epikarst zone. (page 10)

**Vangala, Lakshmisri, Vivek Badwaik, and Chad Willis\*** Antibacterial Activity of Sugar Encapsulated Nanoparticles (Dr. Rajalingam Dakshinamurthy) In recent years significant research is going on in the development of bio-compatible gold nanoparticles (GNPs) for various biomedical applications. In the present study, three average sizes of sugar-encapsulated GNPs were synthesized using green methodology and tested for their antibacterial activities. The antibacterial activity of GNPs was examined by different microbiological assays. To further understand the mechanism, bacterial cells were treated with propidium iodide (PI) and examined by steady-state fluorescence and TEM analysis. Results clearly suggest that bio-compatible sugar-GNPs exert their size dependent antibiotic actions via disrupting the bacterial cell membrane. Hence, these NPs may be useful for the removal of bacterial pathogens from water, food, and various environments and for clinical applications. (page 9)

**Vangala, Lakshmisri** See Badwaik, Vivek (page 14) and Sangoi, Tejas (page 23) and Willis, Chad (page 23)

**Vanover, Eric, Rui Zhang, and Yan Huang** Photocatalytic Aerobic Oxidation Via a Bis-porphyrin-Ruthenium(IV)  $\hat{1}/4$ -Oxo Dimer through a Putative Porphyrin-Ruthenium(V)-Oxo Intermediate (Dr. Rui Zhang) Selective oxidation is a key technology for the synthesis of high value chemicals in the pharmaceutical and petrochemical industries, but oxidations are among the most problematic processes to control. In this context, we have an interest in photochemical generation of highly reactive metal-oxo intermediates that, upon oxidization of substrates, give low-valent metal complexes that can be recycled for catalytic oxidations. In this study, we explore the applicability of ruthenium porphyrins, which are known to display good oxidative robustness, in a light-driven catalytic process. We have demonstrated that the ruthenium(IV)- $\hat{1}/4$ -oxo bisporphyrins catalyzed efficient aerobic oxidation of alkenes and activated hydrocarbons using visible light and atmospheric oxygen. The observed photocatalytic oxidation is ascribed to a photodisproportionation. (page 10)

**Vanover, Eric** See Thompson, Helen (page 21)

**Varajic, Benadin\*, Jon Moore, Joshua Sanford\*, and Cathleen Webb** Effective and Affordable Arsenic Purification Methodology (Dr. Cathleen Webb) High arsenic concentrations in drinking water are a very real and serious health issue faced by millions of people worldwide. Long-term exposure to high arsenic concentrations above the World Health Organization's standard of 10 parts per billion has been linked to serious health effects including digestive tract disease and cancer. Although effective purification techniques exist, their implementation is an unrealistic goal by many third-world nations for a variety of reasons. The most common of these is the expense associated with the implementation and maintenance of what are typically complex procedures. Our research goal is to find a cost-effective method of arsenic purification that is a feasible alternative to current arsenic purification methodology for third-world countries. (page 21)

**Vasa, Shradha, Elizabeth Fedor, Brandon Brugger, YuPing Huang, and James Navalta** The Effect of Three-Day Interval Runs to Exhaustion on Lymphocyte Subset Count, Lymphocyte Apoptosis and Lymphocyte Migration in College-Aged Males (Dr James Navalta) Exercise has an effect on immune cells. The purpose of this study was to determine lymphocyte subset count, apoptosis and migration in response to interval runs to exhaustion on three consecutive days. Five healthy college-aged males participated. They first completed a VO<sub>2</sub> max test and for three consecutive days did interval running at 30 sec max and 30 sec half of max to exhaustion. Blood samples were collected and mixed with antibody cocktails (pre- and post-exercise all three days) and analyzed by flow cytometry. There was an overall increase in cell count after interval running. Significant apoptosis was seen in the CD19+ lymphocyte subset with significant increase observed following exercise on the first and third days. A general increase in lymphocyte migration on day two and decrease on day three may indicate physiological adaptation. (page 19)

**Vaughan, Matthew\*** Fair Trade Education and Awareness at WKU (Dr. Sam McFarland) Many products consumed on college campuses such as coffee and chocolate come from developing countries where producers are often paid insufficiently and exploited. Fair trade certification of products guarantees producers a fair price and other social benefits. The objective of my project is to initiate a successful campaign to increase awareness of fair trade among students at WKU and gain "Fair Trade University" recognition for WKU. My efforts have included establishing a permanent Fair Trade Steering Group, organizing campus-wide awareness events, and partnering with campus groups



to promote Fair Trade education and awareness. I will evaluate the impact of these efforts by reviewing pre- and post-campaign surveys on the awareness and attitudes on fair trade among undergraduate students at WKU. (page 11)

**Vaught, Kasey** The Moral Lapses of Men: Justice Defined by *Watchmen* (Dr. Sandra Hughes) This piece uses *Watchmen*, the work of Alan Moore and Dave Gibbons, to explore concepts of justice. The graphic novel presents multiple justice philosophies via multiple characters. Each hero present within the text displays an attitude that can be linked to theories of retribution, utilitarianism, and others. In this essay, I synthesize the justice concepts with *Watchmen's* characters to prove that, according to the text, there is no such thing as purely good or purely evil. (page 18)

**Vonderschmitt, Kaitlin\* and Jennifer Thomas\*** Interpretation of First Amendment Rights in Honors and Non-Honors College Students (Dr. Scott Lasley) In the recent Supreme Court case, *Snyder v. Phelps*, Snyder sued the leader of the Westboro Baptist Church for protesting at the funeral of his son, who was a fallen soldier in Afghanistan. In this case, we find our first amendment rights are being challenged as many question the extent to which these rights are protected. This research examines the interpretations of the freedoms granted in the first amendment of those who received a more engaging Honors College education with those who have received a standard university education. The goal is to show Honors College students have a more liberal view of the first amendment rights. After surveying 126 Honors college students and 95 non-Honors students, it was determined that Honors students have a slightly more liberal interpretation of the freedoms granted in the first amendment. (page 23)

**Waldrop, Krysta^** See Fugate, Elizabeth (page 14)

**Walker, Rhonda** A Biological Study of the North American Species *Apios priceana* (Dr. Todd Willian) *Apios priceana* was first discovered in 1898 by Sarah Francis Price, a Bowling Green native and naturalist, and it was described and classified by B. L. Robinson in the same year. This biological study of the North American species *Apios priceana* is based on morphological and hereditary observation analysis of specimens under laboratory, greenhouse and field conditions. *Apios priceana* is one of three distinct *Apios* species; two within North America (*A. americana* and *A. priceana*) and one in Japan (*A. fortunei*) are of special interest as possible food crops. Currently, *Apios priceana* is listed as a threatened species by the United States Fish and Wildlife Service and is known from 25 sites in 15 counties in Alabama, Kentucky, Mississippi and Tennessee. Plant interactions with common soil bacteria currently are being researched in a laboratory setting. The purpose of this research is to determine which bacteria have a beneficial effect on *Apios priceana*. (page 9)

**Wang, Kelin, William Orndorff, Yan Cao, and Wei-Ping Pan** Greenhouse Studies of FGD Amended Soil (Dr. Yan Cao) FGD (flue gas desulphurization) gypsum has been widely used for many years in promoting plant growth because FGD gypsum is rich in sulfur and calcium. However, there are concerns about FGD gypsum, which contains certain amounts of toxic elements, such as mercury, arsenic, selenium, boron and chromium. The purpose of this preliminary study is to investigate the occurrence of those metals under effects of evaporation and plant uptake or soil infiltration, as well as factors such as soil pH, the presence of organic matter, and the presence of iron, manganese, and clay. (page 10)

**Wang, Yajie, Huifang Sun, and Michael Smith** Time-Course of Growth Hormone Effects in Zebrafish (*Danio rerio*) Auditory Hair Cell Regeneration (Dr. Michael Smith) Growth hormone (GH) was upregulated during zebrafish inner ear hair cell regeneration following sound exposure in our previous studies. To identify the specific role of GH in hair cell regeneration and the possible cellular mechanisms, zebrafish were divided into a baseline group (no sound exposure, no injection) and a sound-exposed group. After sound exposure, GH or buffer was injected intraperitoneally. BrdU, TUNEL, and phalloidin staining were used to assess the effects of GH on cellular proliferation, apoptosis, and hair cell bundle density, respectively. Time-course curves were established by combining baseline, psed1 (post-sound exposure day1), psed2, and psed3 data. GH demonstrated potent ability to promote hair cell regeneration, which may be achieved through stimulating cellular proliferation and inhibiting cellular apoptosis. (page 10)

**Wang, Yinu and Lawrence Alice** Relationships among *Rubus* (Rosaceae) Species Used in Traditional Chinese Medicine (Dr. Lawrence Alice) Our goal was to elucidate phylogenetic relationships among *Rubus* species in the predominantly Asian subgenera *Idaeobatus* and *Malachobatus* emphasizing species valued in traditional Chinese medicine. We analyzed sequences of six noncoding (plus matK) chloroplast DNA regions totaling ~8,300 aligned characters for 35 *Rubus* species. The strict consensus phylogeny has nearly complete resolution and divides the species into two primary clades; one comprises *R. geoides* (southern trans-Pacific clade), *R. nivalis*, and *R. trivialis* (representing blackberries) and the other is composed largely of *R. arcticus* (subg. *Cylactis*), and subg. *Idaeobatus* (raspberries) and subg. *Malachobatus* species. Within this principally Asian clade, four unresolved lineages exist precluding an improved understanding of the relationships among them. However, three major subclades of Asian species have good support. (page 14)

**Webb, Megan** Textile Design (Prof. Matt Tullis) The objective of my student research project is to create effective visual communication that centers on the overall theme of textile design. I fashioned three digital collages from the works of distinctively different textile design companies, each with its own uniquely vibrant textile prints. The resulting written report and digital collages focus on the following textile design companies: Liberty of London, Marimekko, and Vera Bradley. Each textile company was fashioned within different time periods, originated from different parts of the world, and specialized in three different styles of textile design while representing and expressing their own individual lifestyle concepts. All three of these textile design companies are nationally and internationally recognized. (page 20)

**Weinzapfel, Rachel\*** The Effects of Music on the Social Behavior of a Child with Autism Spectrum Disorder (Prof. Mary Lloyd Moore) Autism Spectrum Disorder (ASD) is defined by the American Speech-Language Hearing Association as a developmental disability that causes problems with social skills and communication. The principle objective of this case study is to determine whether or not listening to music affects the social behaviors of a child with ASD. In addition, this study seeks to determine if listening to different types of music causes a difference in the social behaviors of the child. Two types of music, nursery rhymes and classical instrumental, were used and four specific social behaviors (eye contact, joint attention, facial expressions, and attention seeking) were examined. Five minutes of listening to music was implemented at the beginning of each therapy session. The two musical types were alternated monthly over a semester of therapy. (page 24)

**Wheeler, Makka^** See Gilkison, Victoria (page 17)

**Whelan, Celia^ and Kevin Williams** Reaction Rates of Amino Acids with Analogs of the Anticancer Drug Cisplatin (Dr. Kevin Williams) We are studying the reactions of various amino acids that differ in size and shape with analogs of the anticancer drug cisplatin. Reaction of cisplatin with proteins likely precedes reaction with DNA in the body, and size and shape of the platinum complexes often affect reactions with protein targets more than with DNA targets. In this study, cisplatin analogs were reacted with the amino acid histidine, and the reactions were monitored by NMR spectroscopy. Rate constants were determined and compared with those previously obtained for methionine, a primary amino acid target. Our results suggest that adding bulk to the platinum compound affects reaction with histidine less than with methionine; thus, sufficient bulk may increase the relative number of histidine adducts compared with methionine adducts. (page 22)

**Whetstone, Johnathan** See Patel, Khushbu (page 11)

**Whitley, Paul** See Jennings, John (page 15)

**Whittington, Curt** The Southern Kentucky Sluggers Sportsplex (Prof. Laura Leach) This project involved designing an indoor practice facility for the Southern Kentucky Sluggers athletic organizations. The buildings primary use is for baseball, softball and soccer teams to practice in a controlled environment enabling year-round athletics practice. My client requested the design of a space large enough to carry out daily practices of his baseball, softball and soccer teams. The design is similar to the Palmerio Center located on the campus of Mississippi State University. This type of structure will allow for all types of practice regardless of sport. This building will allow all members to polish their skills during off seasons and when inclement weather prohibits practice outdoors, thus giving them the same advantages of athletics in larger cities. (page 16)

**Wilder, Maggie, David Kem, and Albert Meier** Prescribed Fire Effects on Summer and Fall Herbs in Eastern Mesic Forests (Dr. Albert Meier) Wildfires were once thought to have only negative consequences and were suppressed all over the U.S.. Recently, research has found beneficial effects of fire on herbaceous plants in a number of forest communities. However, the influence of fire on mesic herbaceous communities is unknown. This study examines the influences of spring fires on summer and fall herbs in eastern mesic forests. The spring burns took place on 10 April 2010. Data were collected from 24 two-by-four-meter plots. Summer herb data were collected in early September, and fall herb data were collected in early- to mid-October 2010. Two-way ANOVAs that included slope location as a treatment showed greater abundance in unburned plots for two fall species. Differences between species richness in burned and unburned plots were not significant in either summer or fall. (page 11)

**Willis, Chad\*, Lakshmisri Vangala, and Vivek Badwaik** Synthesis of Glycan-Based Biocompatible Nanoparticles and Its Anti-Bacterial Activity (Dr. Rajalingam Dakshinamurthy) Heparin is a heterogeneous group of straight-chain anionic mucopolysaccharides called glycosaminoglycans that have anticoagulant properties. It plays an important role in various physiological processes like angiogenesis, cell growth, embryogenesis, differentiation, and wound healing. Here we have reported an environmentally friendly, one-step, one-phase and efficient synthetic approach for the synthesis of facile heparin encapsulated stable colloid gold nanoparticles (Hep-GNP's) in aqueous solution. The antibacterial properties of Hep-GNPs were studied using different techniques including steady-state fluorescence spectroscopy. Results of the present study also pave the way for development of numerous applications for Hep-GNP composites, ranging from improving delocalized anticoagulant acidity to antitumor therapy and biosensors. (page 23)

**Willis, Chad\*** See Vangala, Lakshmisri (page 9)

**Wilson, Jenna, Steve Buchanan, and Ron Rizzo** Disposable Remotely Operated Submersible (Dr. Stacy Wilson) The Disposable Remotely Operated Submersible (DROS) is a vehicle that will be used in cave exploration and bridge and dam inspection. Knowledge that was gained from the creation of a previous model (ROS) is being used in the design and fabrication of DROS. It will be smaller, portable, and relatively inexpensive or virtually “disposable.” Information from various sources, such as the WKU Center for Cave and Karst Studies and Lost River Cave, was gathered in order to better suit DROS for the task of cave exploration. When completed, DROS will aid exploration of underwater areas that might be dangerous for human divers – where DROS will assist divers in maneuvering small caverns and passageways in underwater caves and collecting water samples and specimens – and will lower manufacturing costs in the event that the vehicle cannot be recovered. (page 15)

**Wilson, John\* and Keith Andrew** Predictability Time of an Einstein Klein-Gordon Cosmology (Dr. Keith Andrew) The goal of this work is to determine if the Big Rip time predicted by Yurov et al. lies within the predictability time of the Einstein Klein-Gordon cosmology used. This cosmology was reconstructed, and the system was linearized around equilibrium points using matrix linearization. The Lyapunov exponents of the system were then extracted, and the predictability time was estimated. This was qualitatively compared to the Big Rip time as the pressure-density proportionality constant approached -1, and the predictability time was found to occur before the Big Rip time. (page 23)

**Wilson, Laurel\*** Changes in Newspaper Portrayal of Women, 1900-1960 (Dr. Paula Quinn) I have researched the portrayal of women in four American newspapers throughout the twentieth century in order to show the evolution of media treatment of women throughout that time period. I analyze the outside factors contributing to this change, especially the women’s movement, and determine how the two influenced each other. (page 18)

**Wilson, Shana** The Relationship between Superstitious Behaviors of Sports Fans, Team Identification, Team Location, and Game Outcome (Dr. Frederick Grieve) Nearly all of the previous research of superstitious behaviors in sports has excluded a central element to every sporting event: the fans. The portrayal of dedicated fans through media outlets leads to the expectation that fans experience superstitions as do athletes, but little research has been done in this area. The present study is an empirical follow-up to a research report by Wann et al. (2010) that looked at the superstitious behaviors of 675 sports fans, examining the types of superstitions and the fans’ perceptions of their impact. The study examined how a fan’s desire to participate in superstitious behaviors depends on team identification, team location, and game outcome. (page 13)

**Wimsatt, Jacob** WKU Architectural Facility (Prof. Laura Leach) Western Kentucky University’s architecture program has yet to fulfill the facility requirement for National Architectural Accrediting Board accreditation. Western’s architecture students are known by many graduate schools to be some of the most talented and knowledgeable individuals. A facility to take this talent and skill to the graduate level is needed for the future expansion of the program. I propose a structure designed to symbolizes architecture while allowing for efficiency in the teaching and learning of architecture. The design includes an exterior appeal that attracts the eye, along with transparent aspects that invite people inside. Through research the need and specific function of the facility was determined, along with learning new methods and materials of construction in order to achieve a specific exterior aesthetic. (page 17)

**Wittman, Rebecca, Shelby Stephens<sup>A</sup>, David Stephenson, and Kelly McCoy** Perpetual Motion: Action Over Distraction (Prof. Andrew Mienaltowski) College freshmen were given questionnaires involving conflict coping mechanisms. The most popular mechanisms adopted for interpersonal problems involved purposeful behavior and acceptance. These may create a sense of empowerment and a feeling of control over the situation. Such control is vital to college freshmen due to their new-found independence and need to prove autonomy. Social support strategies including emotional support, venting, and religion were popular, suggesting that social support is very important in affirming the control that is sought while independent. The least-used strategies included humor, self distraction, and substance use. These are ways of avoiding the problem by masking emotions and are rarely used because this group may feel no need to disengage themselves from problems and give up control. (page 20)

**Wittman, Rebecca** See Cooper, Anthony (page 23) and Stephenson, David (page 23)

**Wolff, Schuyler\*** See Sadler, Suzanna (page 12)

**Woods, Kurt\* and Christopher Byrne** Acoustic Properties of Carbonized Wood (Dr. Christopher Byrne) Wood, a naturally-occurring anisotropic cellular polymer, has unique acoustic properties in its radial, tangential and longitudinal directions. Wood can be carbonized, leaving a carbon monolith that retains the grain features of the wood. This monolith has acoustic properties similar to the original specimen in directional characteristics but differing in magnitude. Once carbonization of the specimen is complete, it can be transformed into an advanced engineering material by a silicon impregnation process. This presentation covers the material production process and compares the physical properties of the carbonized monolith before and after transformation. We present a comparison of the

measured acoustic properties of the composite to theoretical acoustic properties that are derived from the rule of mixtures. (page 11)

**Wuetcher, Justin** Typographic Transformation (Prof. Matt Tullis) The objective of my student research project is to create effective visual communication that centers on the overall theme of the transition of typography through different mediums. The resulting written report and digital collages are based on how language is viewed throughout the ages and the introduction of typography. My project addresses the pre-printing press period, the use of the printing press, and modern technology. In short, I will be presenting the transformation of typography. (page 21)

**Wurth, Jessica** Street Artists and Anonymity, or the Lack Thereof (Prof. Matt Tullis) In this research project I plan to visually communicate the overall theme of street artists. The three subjects I've chosen to research are the anonymous street artists Blu and Banksy, as well as the not-so-anonymous Shepard Fairey. The written report and digital pieces I have prepared focus on different aspects of street art, namely the anonymous voice behind art, the different methods of creating street art, and the work outside of anonymity. The three digital collages visually represent and communicate these three aspects. (page 20)

**Wynn, Colleen\*** Hopelessly Disadvantaged Like You: A Comparative Study of Disadvantaged Youth in Mobile and Medellin (Dr. Holli Drummond) Much research has examined hopelessness among impoverished urban neighborhoods in the U.S. This research has addressed many dimensions of hopelessness, including variation by race, associations with violence, and the origins of hopelessness. However, little research has focused on comparing the variation of these effects by country (i.e., comparisons of the urban disadvantaged experience in the U.S. with the urban disadvantaged in developing countries). Using two unique data sources, the Mobile Youth Survey (MYS) and a similar survey of disadvantaged adolescents in Medellin, Colombia, this study aims to comparatively examine the process of hopelessness among the "truly disadvantaged" at home and abroad. (page 14)

**Zambrano, Jon** See Price, Daniel (page 16)

**Zhang, Huajian (Thomas)** A Fire Hazard/Risk Analysis from a Geospatial Approach (Dr. Jun Yan) Geographically referenced data consist of geo-attributes and spatial features. For social, economic and human geographic studies, geo-attributes specifically refer to socio-economic characteristics that describe spatial features. Traditional socio-economic studies usually only focus on analyzing socio-economic surveys, while geographic studies usually only focus on analyzing spatial patterns. This research is a geospatial approach that combines both socio-economic and geographic studies. One part of the fire-hazard analysis is a deductive approach that tests the hypothesis by comparing the observed and expected fire-hazard patterns; another part of the fire-risk analysis is an inductive approach that suggests the hypothesis by summarizing the socio-economic characteristics contributed by and based on the fire-hazard analysis. The outcome is a picture of geospatially analyzed high-risk fire vulnerability of Warren County, Kentucky visualized through geographic information systems (GIS) technology. (page 14)

**Zhang, Mo** Strategies for Building Trust through Self-Disclosure in the Neighborhood of the Hill House (Dr. Cecile Garmon) The purpose of this research is to find useful strategies of communication, such as self-disclosure, to help residents to establish good relationships with their neighbors in the Hill House neighborhood near campus. Self-disclosure is the "act of revealing personal information to others." Recent research demonstrated that self-disclosure can reduce uncertainty, impress others, and improve satisfaction. The research question is What kind of strategies of self-disclosure work for building trust in the Hill House neighborhood? I hypothesize that self-disclosure could be an effective communication tool to establish neighborhood relationships. This research involved collecting qualitative data from the residents of the Hill House neighborhood through interviewing. In order to qualify for the research, the interviewees should have lived in the Hill House neighborhood at least one year. This research provides useful information to help the neighbors of the Hill House. (page 9)

**Zhu, Lin** Electrically Controlled Formation and Release of Admicelles for Solid Phase Extraction (Drs. Eric Conte and Stuart Burris) Many toxic or potentially harmful pollutants like polycyclic aromatic hydrocarbons (PAHs) are released into the environment daily. PAHs are determined mainly by chromatographic techniques. However, only a few methods in the parts per trillion (ppt) ranges meet regulatory requirements. The use of admicelles as a preconcentration phase is a relatively new approach for the preconcentration and subsequent determination of chemical substances. An electrically controlled method based on admicelle formation on a solid gold surface using SDS was carried out to preconcentrate PAHs. In this technique, the adsorbed SDS forms one monolayer on a polycrystalline gold substrate by simple electrostatics as the primary driving force. PAHs are attracted to the admicelles, and then the PAH-surfactant association is released on the gold surface. (page 10)

**Zolman, Nicholas<sup>^</sup> and Lydia Brothers<sup>^</sup>** A Light in the Darkness: Finding Type Ia Supernovae in the CANDELS Hubble Space Telescope Survey (Dr. Louis Strolger) Dark energy is best determined by using the distances of Type Ia supernovae. The CANDELS Program will utilize the Hubble Space Telescope to find these supernovae at unprecedented distances. Our role is to examine these images in real time using astronomical tools to find rising and

declining Type Ia supernovae in the early universe. If an object is found in the later filtered images and not in the initial “template” image, then the object is a likely supernova candidate, and one of particular interest. Conversely, if an object is found in the initial template image and not in the later filtered images, then it still could be a supernova, but is of slightly less interest as it is already on the decline. The strongest supernova candidates we find will ultimately be observed by the Hubble Space Telescope for further follow-up observations. (page 22)



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