

Program and Abstracts
Celebration of
Student Scholarship

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**Showcase of Student Research,
Scholarship, Creative Work,
and Performance Arts**

April 27, 2011

Celebration of Student Scholarship

April 27, 2011

Program Overview

Adron Doran University Center

Registration, poster and Powerpoint set-up, and continental breakfast	8 – 8:55 a.m.	
Oral Presentations	9 – 11:45 a.m.	301, 302, 312, Riggle, Commonwealth & Eagle Meeting Rooms
Lunch	11:45 a.m. – 12:45 p.m.	Crager Room
A. Frank and Bethel C. Gallaher Memorial Music Performance	12:45 – 1 p.m.	Crager Room
Poster Presentations	1 – 3 p.m.	Crager Room
Concluding Remarks	3 p.m.	Crager Room
Poster removal	3:10 p.m.	

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Wayne Andrews, President
Karla Hughes, Provost
Bruce Mattingly, Director, Office of Undergraduate Research
Robert Albert, Dean, College of Business and Public Affairs
Cathy Gunn, Dean, College of Education
M. Scott McBride, Dean, Caudill College of Arts, Humanities and Social Sciences
Roger McNeil, Dean, College of Science and Technology

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I am pleased to welcome you to the Sixth Annual Celebration of Student Scholarship at Morehead State University. During this campus-wide event, the University community will acknowledge the excellent efforts of students in research, scholarship and creative productions. I take great pride that at MSU, scholars teach and empower a diverse population of students to succeed in pursuing their educational goals.



As president of this great University, I firmly believe that scholarship and service go hand in hand with teaching in providing the most effective learning environment. Faculty members who mentor students in research and other creative activities provide a vital spark that challenges and stimulates these creative minds. As a result, our academic programs provide abundant opportunities for students to work side by side with faculty in meaningful research and creative initiatives. This special event provides a unique opportunity for everyone to see the products of these faculty-mentored student projects. The work presented by these students is truly amazing!

As you review the Celebration of Student Scholarship program, you will find an array of undergraduate accomplishments in individual and group research projects, creative efforts, and artistic performances in a variety of academic disciplines. By attending this showcase, you provide support and encouragement to our young scholars and artists.

The vision for our University is to be recognized for our superb teaching and scholarship. Through the efforts of our dedicated faculty, Morehead State University will become a premier "institution of choice" for students who want to engage in the process of discovery and become outstanding citizens in an ever challenging and changing world.

Dr. Wayne Andrews, President

I am pleased to be part of this great event in the Celebration of Student Scholarship. While the learning that takes place through structured classroom activities is important, the participation in research and creative activity provides an opportunity for students to transition from learner to scholar. Once an individual has been involved in seeking answers to research questions or in creative expression based on theories and principles, they approach learning from a different perspective.



For many of these students, it has been the opportunity to discover their own abilities in the application of knowledge. And, through the work of the faculty mentor(s), they have been challenged to look beyond the security of their knowledge base to ask "what if" or "why?" This process has awakened the desire for some students to move beyond an undergraduate degree to pursue advanced degrees and opened a new world of discovery to them.

This Celebration is an excellent illustration of the integration of scholarship, teaching and learning. I wish to thank everyone who has been involved in planning and implementing the projects that have contributed to the intellectual and creative development of our students. I congratulate the students who accepted the challenge to engage in the role of student scholar; to stretch their minds and talents; and to become role models for their peers. I hope you enjoy the events that have been planned in Celebration of Student Scholarship.

Dr. Karla Hughes, Provost and Vice President for Academic Affairs

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“Great universities are noted for the scholarship and creativity of their faculty and students. This Sixth Annual Celebration of Student Scholarship program highlights our commitment to undergraduate research and creativity, and our progress toward the goal of becoming the best public regional university in the South. I offer my hearty congratulations to these student scholars, and my great appreciation to the faculty mentors who go the extra mile to challenge these young scholars outside the formal classroom setting.”

Dr. Bruce Mattingly, Director, Office of Undergraduate Research

“The Student Research and Creativity Celebration is the capstone event that recognizes the important contributions of faculty and student collaborative research to the overall education of our students at Morehead State University. Our faculty and students alike benefit tremendously from these one-on-one teaching and learning experiences.”



Dr. Robert Albert, Dean, College of Business and Public Affairs



“This Celebration Week showcases MSU's students - their talents, their enthusiasm, and evidence of their research projects. Through their experiences as undergraduate fellows, these teacher candidates learn the discipline of research and we believe the excitement and professionalism as student researchers infuses the classroom at the undergraduate level and then carries into the P-12 classroom. The College of Education faculty and staff are proud of these students as they engage in creativity and problem solving.”

Dr. Cathy Gunn, Dean, College of Education

“The faculty and staff within the arts, humanities, and social sciences applaud the focus and priority placed on learning that brings faculty and undergraduate students together as collaborators in research and creative production. To be sure, an educational curriculum based upon ‘Undergraduate Scholarship’ enhances a student’s entire academic experience by advancing interdisciplinary insights, deepening scholarly engagement and empowering students and faculty to work as partners in practice. With this annual event, Morehead State University celebrates its culture of academic excellence and its long tradition of providing substantial educational opportunities to the citizens of Kentucky.”



Dr. M. Scott McBride, Dean, Caudill College of Arts, Humanities and Social Sciences



“The Celebration of Student Scholarship provides a wonderful opportunity to recognize and highlight student scholarship and creative accomplishments. Student research and creative activities, as a collaborative enterprise between student and faculty mentor, is a critical component of undergraduate education and enhances student success as well as teaching and learning across the academy. Students working with faculty experience the excitement of creating new knowledge and solving challenging problems – increasing important life skills in today’s world.”

Dr. Roger McNeil, Dean, College of Science and Technology

Celebration of Student Scholarship

Adron Doran University Center
Morehead State University

April 27, 2011

Concurrent Session – 301 ADUC

9 – 9:15 a.m. **China in the balance: Can economic interdependence bring stability to South Asia**

301 ***Lauren VanHook, James Masterson, Mentor, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs**

Throughout the Cold War, China has balanced against its rival India by allying with India's principal adversary, Pakistan. As relations between India and Pakistan remain tumultuous, China finds itself in a dilemma. Burgeoning Chinese and Indian economies have resulted in higher levels of economic interdependence (EI) between the two formal rivals while Pakistan's government and economy have continued to falter. This paper provides a comparative analysis of how economic interdependence has affected Sino-Indian and Sino-Pakistani political relations over the past several decades. The paper then addresses the implications of Sino-Indian cooperation based on EI for the future of Indo-Pakistani relations. This research was supported by an MSU Undergraduate Research Fellowship.

9:15 – 9:30 a.m. **Determinants of heart disease in Kentucky counties**

301 ***Douglas Volk, Dr. S. Ali Ahmadi, Mentor, School of Business Administration, Department of Accounting, Economics, and Finance, College of Business and Public Affairs**

The purpose of this study was to investigate some of the factors contributing to the prevalence of heart disease in the Commonwealth of Kentucky. The data for this study were acquired from www.kentuckyhealthfacts.org and www.socialeplorer.com. Using data from 55 Kentucky counties, this study utilized a Multiple Regression model in which Prevalence of Heart Disease in these counties was modeled as a function of several factors such as, living in poverty, lack of health insurance, prevalence of obesity and prevalence of smoking. The results of the study indicates obesity, lack of medical insurance and living in poverty in these counties are significantly correlated with the prevalence of heart disease but, paradoxically, the results of the study showed smoking did not significantly contribute to prevalence of heart disease.

9:30 – 9:45 a.m. Common, statutory and constitutional issues in climate change litigation

301

***Allison Miller, Dr. William C. Green, Mentor, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs**

Climate change is a major political issue of our age. United States is a leading emitter of greenhouse gasses, but the federal government has not been the climate change policy leader. State and local governments have been actively involved in designing statutory and regulatory responses and in initiating climate change litigation. Our paper examines the use by state and local governments and by private parties of the federal and state common law of public nuisance and state private nuisance, trespass, and negligence law against power companies and automobile manufacturers, the use of the political questions and preemption doctrines as obstacles to these claims, the leading federal court decisions on these issues, and the extent to which this litigation can effect climate change policy.

9:45 – 10 a.m. How do good apples grow from good seeds?: Exploring social entrepreneurs' moral imagination strategies

301

***Sara Bradley, Dr. Lindsey N. Godwin, Mentor, School of Business Administration, Department of Management and Marketing, College of Business and Public Affairs**

Social entrepreneurs create ventures that provide mutually beneficial outcomes for business and society by translating their moral imagination into action. Prior research has focused primarily on personal characteristics of social entrepreneurs; thus we know little regarding their influence on the strategic development of their ventures, or how they translate their values into an ethical business approach. This study sought to explore the strategies social entrepreneurs employ to actually achieve mutually beneficial goals. We analyzed the 155 organizations in Schwab Foundation's 2010 list of social entrepreneurs. Using inductive thematic coding, we categorized each venture based on the founders' moral motivation, the organizational mission, and organizational strategy. Primary findings include eight different social entrepreneurial strategies. This research was supported by the MSU Undergraduate Research Fellowship program.

10 – 10:15 a.m. Identifying gang clusters in Albuquerque, New Mexico: Exploratory spatial analysis of gang arrests and gang residence

301

***Matthew Laurin, Drs. Paul Steele and Timothy Hare, Mentors, Department of Sociology, Social Work and Criminology, Caudill College of Arts, Humanities and Social Sciences**

Previous Research has suggested that gangs are concentrated in similar locations as their gang affiliations (Shaw and McKay, 1942; Whyte, 1943). However, more recent research shows gang members do not all live in the neighborhoods that their gangs are grounded in (Taylor, Gottfredson, and Brower, 1984; Moore, 1988). The purpose of this study is to pinpoint residential patterns of gang members and criminal locations of gang arrests. The data came from Bernalillo County police department arrest records in Albuquerque, New Mexico, and GangNet, a police intelligence database that identifies known gang members. Results indicate that gang residential patterns are sparse and not all located in one specific area of the city. Also, criminal arrests occurred more frequently in high concentrations of gang residents around the city. Further research should measure statistical significance of spatial findings and explore intra-gang neighborhood contextual differences.

10:15 – 10:30 a.m. Break

10:30 – 10:45 a.m. The affects of online social networks on expatriate adjustment

301

****Amy Appleman, Dr. Ahmad Hassan, Mentor, School of Business Administration, Department of Management and Marketing, College of Business and Public Affairs***

This study seeks to investigate the effects of online social networks systems (OSNS) on expatriate adjustment. Specifically, this study will utilize existing social capital theories to explore the effects of OSNS on general and interaction expatriate adjustment. Our argument is OSNS acts as facilitators for helping expatriates to gain the social capital needed to achieve cross-cultural adjustment. Social capital and exchanges are crucial for cross-cultural adjustment. The social capital perspective, with its focus on relational and structural embeddedness, allows us to explicitly model how online social network systems influence expatriate adjustment. OSNSs can allow people to maintain and develop their social capital regardless of location. Expatriates can use OSNS to utilize social capital to cope with adjustment. This research was supported by an Undergraduate Research Fellowship.

10:45 – 11 a.m. Assessing Kentucky’s prison growth issue in context of the national prison dilemma

301

****Ashley Adkins, Drs. Paul Steele and James Masterson, Mentors, School of Public Affairs, Institute for Regional Analysis and Public Policy, College of Business and Public Affairs***

The Commonwealth of Kentucky, like many states, has been confronted with issues of an increasing prison population which has lead to increasing prison expenditures in the time of a budget crisis. Time series regression analysis has been conducted to analyze the impact of social, economic and political variables on both the prison population and prison expenditures in Kentucky. This research moves beyond the forces behind Kentucky’s imprisonment situation to place them in the context of prison populations across the nation. Examining the issue of Kentucky in this national context allows for specific policy suggestions to be made in relation to containing the prison population while maintaining current safety levels.

11 – 11:15 a.m. Quality of life and economic condition: A comparative county analysis

301

Ashley Adkins, Jocelyn Gross, *Cory Owens, *Tony Pence, William Scaggs, and Morgan Stratton, RAPP 300: Seminar in Regional Issues I, Drs. Christine McMichael and Stephen Lange, Mentors, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs

Previous RAPP 300 projects have found that “quality of life” is vitally important to leaders and residents when they reflect upon their community’s economic progress. While this makes sense intuitively, we wanted to understand more clearly what quality of life is and what its relationship is to economic status. We investigated relationships between 14 quality of life measures and economic conditions for a group of five rural Kentucky counties, each of which had experienced different economic conditions since 1960. Results from our analysis suggest that utility, public safety and education measures are most closely tied to county economic conditions in our study area; other measures were less linked to quality of life. This project was funded in part by the ARC-sponsored Appalachian Teaching Project.

11:15 – 11:30 a.m. Is virtual virtually the same? An exploration of student and advisor perceptions toward e-advising

301 *Marlene Blankenbuehler (MBA Candidate), Dr. Lindsey Godwin, Mentor, School of Business Administration, Department of Management and Marketing, College of Business and Public Affairs

Given that universities are increasingly using e-advising tools, it is important that advisors' and students' perceptions regarding the effectiveness of e-advising are better understood. Thus, the research question explored in the current study was: what are the perceived benefits and drawbacks of e-advising? Specifically, we sought to compare advisor and student perspectives on what developmental and prescriptive elements are potentially gained and lost in an e-advising environment. The current study included 163 undergraduate students and 53 advisors from a midsize, mid-western public university. Results suggest that while students and advisors like the convenience of e-advising, there is still a strong desire for maintaining the developmental aspects of the advising relationship.

11:30 – 11:45 a.m. Education in the American republic according to the founding fathers and progressive reformers

301 *Blake Bedingfield, Jonathan Pidluzny, Mentor, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs

As American performance on standardized international educational assessments continues to decline, it is important to consider anew the aims of public education. This paper provides an overview of the American Founders' understandings of the purposes of public education – character formation, the dissemination of essential knowledge for effective civic and political participation, and the cultivation of statesmen who would “refine and enlarge the public view” – and, in this context, the Progressives' reforms to public education, in particular, their emphasis on curricula designed to support the individual's pursuit of “personal autonomy.” The relationship between the Progressives' new educational outlook and their vision for a centralized administrative state designed to achieve “new goals of politics” is also explored. An MSU Undergraduate Research Fellowship supported this project.

Concurrent Session – 302 ADUC

9 – 9:15 a.m. Parental expressed emotion and children's attachment

302 *Leah Smith, Chelsea Witt, Dr. Shari Kidwell, Mentor, Department of Psychology, College of Science and Technology

Children's attachment is influenced largely by parenting sensitivity. The current study examines a specific type of insensitivity – expressed emotion. Forty parents and their 4-year-old children participated. Ainsworth's Strange Situation separation and reunion procedure (1978) was utilized, and was coded for attachment (Crittenden, 2004). Expressed emotion, involving criticism and emotional over-involvement (i.e., being too close or enmeshed), was assessed via coding interviews about parents' perceptions of themselves and their children. Analyses suggested insecurely attached children had parents higher in expressed emotion, consistent with our hypothesis. This was especially true of insecure-ambivalent children. These findings suggest that expressed emotion is a potentially useful index of insensitive parenting. This work was supported by grants from RCPC and KY EPSCoR, and by an Undergraduate Research Fellowship.

9:15 – 9:30 a.m. An experiential study of publishing and editing

302

***Brandon Massengill, Crystal Wilkinson, Mentor, Department of English, Caudill College of Arts, Humanities and Social Sciences**

Over the course of this undergraduate fellowship, I have assisted in all components of the editing process including making preliminary decisions on the final selections for Mythium Literary Journal. My responsibilities included aiding in the correspondence to the writers, promotion of the journal, handling author contact, copyediting and other duties. The goals for the fellowship are to fully prepare me to enter the publishing field having worked on the staff of an international journal and to also aid in obtaining a publishing assistantship when seeking an MFA program. This fellowship will also provide me with techniques to use in the pursuit of having my own fiction published. Through this project, I have also been introduced to a variety of multicultural voices currently unavailable to undergraduate students.

9:30 – 9:45 a.m. Deep, dark and scary

302

***Luke Grimes, Dr. Pam Ryan, Mentor, Department of History, Philosophy, Religion and Legal Studies, Caudill College of Arts, Humanities and Social Sciences**

I am assisting Dr. Ryan in gathering data concerning a book she is writing. The book is titled ‘Deep, Dark and Scary’ and is organizing and analyzing those deepest, darkest, and scariest thoughts that plague humans (the ones that keep you awake at night). We are administering a non-scientific, anecdotal survey and after the survey has been completed, we will use philosophical insights to alleviate some of the deepest, darkest and scariest thoughts with which humanity lives. The current contenders for the deepest, darkest and scariest thoughts are: a) Uncertainty, b) Death, c) Loss of control, d) Loneliness, and e) Betrayal.

9:45 – 10 a.m. Efficacy of the Miller Forensic Assessment of Symptoms Test (M-FAST) to detect malingered AD/HD.

302

***Kelly D. Gruber, Dr. Sean P. Reilley, Mentor, Department of Psychology, College of Science and Technology**

Complaints of distractibility and inattention are common and often hastily linked to Attention Deficit/ Hyperactivity Disorder (AD/HD) given the plethora of pharmaceutical advertisements for AD/HD medications. This concern coupled with widely available information on AD/HD and attractive secondary gains for feigning the disorder led to the current investigation of the use of the Miller Forensic Assessment of Symptoms Test (M-FAST) to detect malingered AD/HD. Using a simulation design, college students asked to feign AD/HD yielded subscale elevations on the M-FAST compared to non-malingering controls. Detection sensitivity for AD/HD was improved by incorporation of two of four M-FAST subscales. Research supported by an MSU Undergraduate Research Fellowship, a prior grant from Kentucky EPSCoR, and the MSU Office of Undergraduate Research.

10 – 10:15 a.m. Legitimacy through narrative: The creation of political ideologies in the Spanish Civil War

302

***James Kyle Hager, Dr. Kris DuRocher, Mentor, Department of History, Philosophy, Religion and Legal Studies, Caudill College of Arts, Humanities and Social Sciences**

Examining the political narratives of the countries involved in the Spanish Civil War within their historical context highlights the importance of a bottom-up approach to understanding political narratives. It is vital to consider the construction of alternative political narratives as a tool for understanding the disparate viewpoints propagated by various political entities, their motives, and their effectiveness in legitimizing their political maneuvers. In breaking down the grand narrative of the Spanish Civil War, those narratives that did not succeed are brought to light and legitimized.

10:15 – 10:30 a.m. *Break*

10:30 – 10:45 a.m. *The impact of AD/HD malingering on the digit vigilance test*

302 **Medina Jackson, Dr. Sean P. Reilley, Mentor, Department of Psychology, College of Science and Technology*

Attention Deficit/Hyperactivity Disorder is a neuropsychological disorder involving hyperactivity/impulsivity and/or inattention. Concerns about malingered AD/HD for secondary gain have increased due in part to media interest. Neuropsychological measures are less affected by malingering whereas attention rating scales are highly susceptible to malingered AD/HD. Little research exists on the impact of malingering on the Digit Vigilance Test, a paper-and-pencil neuropsychological test of visual sustained attention. The current study found that college students asked to feign AD/HD produced significantly lower scores on the DVT relative to a control group. However, their DVT scores were significantly more impaired than an AD/HD group. Research supported by an MSU Undergraduate Research Fellowship, a prior grant from Kentucky EPSCoR, and the MSU Office of Undergraduate Research.

10:45 – 11 a.m. *Building momentum: Laying the foundation for a successful writing program*

302 **Sean L. Corbin, Chris Holbrook and Crystal Wilkinson, Mentors, Department of English, Caudill College of Arts, Humanities and Social Sciences*

Building on a two-year development plan, this project utilized event planning, physical and Web-based promotional tactics, and student-faculty coordination to further strengthen and expand extracurricular opportunities for MSU creative writing students. Through various guest speakers, panel discussions, and conference and publishing opportunities through Inscape, MSU's art and literary magazine, methods of developing hands-on practical experience for the career-oriented writing student were explored. This project was supported by an MSU Undergraduate Research Fellowship.

11 – 11:15 a.m. *Relationships between psychological flexibility, physical health, and psychological distress*

302 **Aaron C. Ellis, Dr. J.T. Blackledge, Mentor, Department of Psychology, College of Science and Technology*

It has become widely accepted that psychological health and physical health are not only highly correlated, but may exert influences upon one another. The present research is focused on determining the nature of the relationship between Psychological Flexibility and physical health. Psychological flexibility is a dimension of mindfulness-based Acceptance and Commitment Therapy (ACT). Another objective of this research is to describe the relationship between measures of distress and psychological flexibility. Ultimately, these data will provide a framework on which research can be conducted in order to provide insight into the influences psychological flexibility as an influence on physical health and in the end contribute to health-based interventions. This research was supported by an MSU Undergraduate Research Fellowship.

11:15 – 11:30 a.m. *The concept of evil, contrasts between Aristotle and Hume*

302 **Derek Cundiff, Dr. Scott Davison, Mentor, Department of History, Philosophy, Religion and Legal Studies, Caudill College of Arts, Humanities and Social Sciences*

History is a dichotomy of what is inherently good and inherently evil. Philosophers Aristotle and David Hume had ideologies about this exact topic. Aristotle's conclusions were that all men have reason and they use action to obtain good or happiness. He formulated a scale based on the "mean" which was good and extremes either too little or too much are what constitute evil. Through action, we establish the correct virtues through habituation and education. To Hume, evil does exist but it comes from within us, we perceive things, then project our ideas upon it. To conceive good and evil, we use our senses and perceptions rather than reason and morality, because if not there exists no wrong. Good and evil lies in each of us judging an action, the idea called Emotivism. This paper will contrast the two philosophers and examine why Hume's ideas seem more realistic in our world than those of Aristotle's.

11:30 – 11:45 a.m. Philosophy in the media: How philosophical issues affect American media

302

***Jonathan Fannin, Dr. Wendell O'Brien, Mentor, Department of History, Philosophy, Religion and Legal Studies, Caudill College of Arts, Humanities and Social Sciences**

From CNN to Fox News, there is a varying array of views on important issues in our nation. Whether or not they are conscious or acknowledged, there are philosophical assumptions which effect what news is discussed and how it is reported. I wish to point out some of the philosophical issues discussed and how the philosophical assumptions of media outlets effect their reporting and what these assumptions imply about our nation. This study was funded by the Undergraduate Research Fellowship program at Morehead State University.

Concurrent Session - 312 ADUC

9 – 9:15 a.m.

Conodonts from the target bedrock, impact breccias of the Houghton Impact Structure, Devon Island, Nunavut, Canada

312

***Erika R. Neace, Dr. Charles Mason, Mentor, Department of Earth and Space Sciences, College of Science and Technology**

Samples of target bedrock and clasts from the impact breccias of the Houghton Impact Structure were collected during the 2007 and 2008 field seasons. The samples were first broken into small pieces by hand then weighed and placed into Formic acid to dissolve. The residue caught on the #170 mesh sieve from each sample was run through a heavy liquid separation to concentrate the conodonts. The heavy fraction was then picked for conodonts. The objective was to obtain conodonts from each of the samples in order to determine their relative age as well as the thermal maturation of the samples using the CAI index of conodonts. To date all samples processed contained an adequate number of conodonts with which to determine the thermal maturation of the sample; however, a few of these samples did not contain adequate "Index" conodonts for relative age determination. An MSU Undergraduate Research Fellowship, RCPC, KSGC, and the Mars Institute supported this research.

9:15 – 9:30 a.m.

Actin filament structure and dynamics are dependent on Rho-kinase activity in the A7r5 smooth muscle cell

312

***Josie Maione, William R. Hankinson, Suzette Pike, Dr. Michael E. Fultz, Mentor, Department of Biology and Chemistry, College of Science and Technology**

Smooth muscle cells demonstrate unique contractile properties that may depend on actin cytoskeletal remodeling. However, then mechanism(s) regulating this remodeling is not completely understood. Arrangements of alpha-actin and beta-actin cytoskeletal components were examined before and after inhibition of Rho-kinase. Results suggest that Rho-kinase may selectively regulate the formation and maintenance of alpha-actin podosomes. Data collected further suggests that Rho-kinase activity may be necessary for the maintenance of alpha-actin filaments in the resting cell as our results suggest that the inhibition of Rho-kinase promotes dissolution of alpha-actin filaments. Therefore, Rho-kinase may play a critical role in the regulation of smooth muscle contraction. This project was supported by the MSU Undergraduate Research Fellowship and NIH-INBRE grant #5P20RR16481-09.

9:30 – 9:45 a.m. Plastic bottles vs. aluminum cans: A case study in sustainable design

312

***Amariah E. Belcher, Dr. Nilesh N. Joshi, Mentor, Department of Applied Engineering and Technology, College of Science and Technology**

Environmentally sustainable design is a philosophy that focuses on minimizing negative impacts of products on the environment during their design stage. In this research, we explore this philosophy and its application to an interesting day-to-day problem. The use of plastic bottles and aluminum cans as beverage containers is prevalent in our society. The CAD models of these two products were created using SolidWorks 3D modeling software and a sustainable design study was performed on the CAD models using a tool known as *SustainabilityXpress*. The negative environmental impacts of both products were quantified and compared. The following five impact factors were considered: carbon footprint, energy consumption, air acidification, water eutrophication, and water footprint. This project is supported by the MSU Undergraduate Research Fellowship.

9:45 – 10 a.m. The effect of adipocyte determination and differentiation factor-1 on fresh pork quality

312

***Moriah L. Penick, Drs. Rebecca Emmett Miculinich and Troy J. Wistuba, Mentors, Department of Agricultural Sciences, College of Science and Technology**

Consumers and many segments of the pork industry continue to demand improvements in the quality of fresh pork products. The objective of this study is to determine the effect of a promising candidate gene, adipocyte determination and differentiation factor-1 (ADD1), on pork quality traits. ADD1 is a transcription factor believed to play a role in lipid biosynthesis in humans and has been found to be involved in the over-expression of certain genes in obese mice. Two hundred Berkshire and Landrace sired pigs were genotyped using PCR-RFLP procedures. ADD1 allele-2 was found at a higher frequency (.8) in the Berkshire population as compared to the Landrace population (.5). ADD1 genotype-22 pigs were significantly ($P < .05$) fatter, had greater intramuscular fat % ($P < .01$) and marbling scores ($P < .01$) when compared to ADD1 genotype-11 pigs. ADD1 genotype-11 and 12 pigs had significantly larger loin muscle area ($P < .01$) compared to the 22-genotypes. ADD1 genotype groups did not differ significantly ($P > .05$) for ultimate pH, Minolta reflectance, Warner-Bratzler shear force, purge loss, color score, firmness and cooking loss. Results indicate that ADD1 may have potential for use in marker assisted selection for the improvement of quality attributes associated with marbling in fresh pork. Further characterization of the effects of ADD1 in a larger population is ongoing. Funding for this project was provided by the MSU Undergraduate Research Fellowship, the MSU Center for Regional Engagement Grant and the Ohio State University Department of Animal Sciences.

10 – 10:15 a.m. Tree growth within Spaws Creek Gorge: Effects of climate

312

***Ross T. Healy, Dr. Allen C. Risk, Mentor, Department of Biology and Chemistry, College of Science and Technology**

The science of dendrochronology uses tree ring analysis to study the chronological sequence of annual growth in trees. The samples taken from the trees, referred to as “cores,” allow researchers to study the silent history of the individual tree or, collectively, the forest. The purpose of this study was to analyze *Quercus* spp. (oaks) to determine what correlations could be found between annual growth ring thickness and environmental variables such as precipitation and temperature. Trees were sampled with increment borers based on diameter at breast height in a series of 10 x 20m, sub-random plots at creek, mid-slope, and cliff elevations on both the north and south facing slopes. Cores were sanded and processed according to standard dendrochronological techniques. This research was supported by a grant from the Office of Research and Sponsored Programs at Morehead State University.

10:15 – 10:30 a.m. Break

10:30 – 10:45 a.m. Expression of *Acinetobacter*'s predicted cleavage and nucleophilic residue mutants of UmuD in *Escherichia coli*

312 *Sabal Adhikari, Dr. Janelle Hare, Mentor, Department of Biology and Chemistry, College of Science and Technology

An UmuD₂-UmuC error prone polymerase conducts SOS mutagenesis in *E. coli*, but the UmuD form present in *Acinetobacter baylyi* (UmuDAb) contains an extra N-terminal region. We are investigating the function of this UmuD homolog and the roles of this extra region in SOS mutagenesis and DNA damage response. We have created a mutation at the predicted cleavage site of UmuD. Surprisingly, Western analyses have shown that UmuDAb that is mutated at the predicted cleavage site still disappears after mitomycin C treatment in *E. coli*. We have also created, and are currently testing a mutant in the predicted nucleophilic residue required for cleavage. This work was funded by grant 1R15GM085722-01.

10:45 – 11 a.m. Comparing effects of aspect and elevation on woody plant community composition at Spaws Creek Gorge in Menifee County, Kentucky

312 *Hannah K. Jacobs, Dr. Allen C. Risk, Mentor, Department of Biology and Chemistry, College of Science and Technology

Woody plant community composition was studied within Spaws Creek Gorge in Menifee County, Kentucky. Woody plants with a trunk diameter of 5cm or greater were examined in twenty-four 200 m² plots divided evenly among north- and south-facing slopes and elevations (creek, middle, and cliff). Importance values (relative density + relative frequency + relative size) were used to compare the effect of aspect and elevation on the woody plant community. Preliminary results indicate eastern hemlock and cherry birch were more dominant on the north-facing slopes, scarlet oak and sour wood were more dominant on the south-facing side, and basswood was most abundant in the creek plots. This research was supported by a grant from the Office of Research and Sponsored Programs at Morehead State University.

11 – 11:15 a.m. Biodiversity surrogacy and bryophyte species richness at different spatial scales in Spaws Creek Gorge, Kentucky

312 *Alexia Callihan, Dr. Allen C. Risk, Mentor, Department of Biology and Chemistry, College of Science and Technology

Can vascular plants be employed as surrogates for bryophyte species richness? This is a question of biodiversity surrogacy, a shortcut in estimating diversity. Resulting biodiversity trends may also be examined at different spatial scales. Thirty 10x20m permanent plots were established in Spaws Creek Gorge in Daniel Boone National Forest, Menifee County, Ky. The plots were assessed at 1m² and 10m² in opposite corners, and 200m². Specimens were collected from 18 plots, stored and identified in MDKY. At the 200m² scale linear regression indicated decreasing richness with increasing elevation and significant positive correlation between bryophyte and all vascular plant richness, and between bryophyte and pteridophyte richness at all scales. This research was supported by an Undergraduate Research Fellowship from MSU and the Kentucky Academy of Science.

11:15 – 11:30 a.m. Optimization of scanning electron microscopy preparation procedures for bacterial subcellular imaging

312 *Tiffany Stacy, *Sofeia Aslam, *Mallory Mattingly, *Slim Khouja, Dr. Douglas Dennis, Mentor, Department of Biology and Chemistry, College of Science and Technology

A novel lysis procedure has been developed that exposes large sections of bacterial inner surfaces. To take advantage of this procedure, high resolution imaging will be done using atomic force microscopy and field emission scanning electron microscopy. Before this can be accomplished, proper preparative procedures must be developed and analyzed for their efficacy. This project details the different types of preparative procedures considered, the preparative procedures employed on a test basis, and their analysis. A summary of these procedures will be presented, as well as strategies on how which procedures will be employed in further studies.

11:30 – 11:45 a.m. Canopy accession patterns in Spaws Creek Gorge, Menifee County, Kentucky

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***Heidi Ciccarelli, Dr. Allen C. Risk, Mentor, Department of Biology and Chemistry, College of Science and Technology**

Patterns in canopy composition are complex and dynamic. Canopy composition paired with growth releases indicates a forest's history. Examination of the duration and frequency of release events, paired with knowledge of understory makeup, can predict future canopy composition. Increment cores were taken from canopy trees belonging to *Quercus*, *Liriodendron tulipifera*, and *Tsuga canadensis* in Spaws Creek Gorge, Menifee County, Ky. After cores were processed, dated, and cross verified, measurements of annual tree growth along with tree canopy position were analyzed to determine quantity and longevity of release and suppression events. Results indicate how these groups exhibit suppression and release events. These results, together with understory composition, allow more accurate predictions of future canopy composition. This research was supported by a grant from Morehead State University.

Concurrent Session – Commonwealth Room

9 - 9:15 a.m. Using current technologies to enhance access to Eastern Kentucky arts oral histories

Commonwealth

***Jessica Ratliff, *Megan Arnold, *Cecily Howell, Dr. Joy Gritton, Mentor, Department of Art and Design, Caudill College of Arts, Humanities and Social Sciences**

The Eastern Kentucky Arts Project (EKAP) is expanding access to Eastern Kentucky art and music history by collecting, transcribing, and posting oral histories; collaborating with the Kentucky Center for Traditional Music (KCTM) to catalog and share their 10,000 hours of music recordings dating back to the 1920s; and searching the databases of the Kentucky Oral History Commission, the Digital Library of Appalachia, the Archive of Folk Culture, and other regional and national repositories to identify oral history collections relevant to the arts in Eastern Kentucky. This EKAP oral history initiative aims to make these important collections more readily known and available to educators, students, artists, and community members working to strengthen Eastern Kentucky communities through the arts.

9:15 - 9:30 a.m. Images of women in blackface minstrelsy, 1830-1950

Commonwealth

***Kiley Romanesko, Dr. Ric N. Caric, Mentor, Department of International and Interdisciplinary Studies, Caudill College of Arts, Humanities and Social Sciences**

This research focuses on the representation of black women in blackface minstrelsy from 1830-50. The minstrel songs that represented black women were written and performed by white, male performers and were an important element in the popular culture of the 1830s and 1840s. These images include representations of black women as slaves, girlfriends, and wives and can be found in songbooks, joke books, comic almanacs, and newspapers. Minstrel images of black women are still significant in contemporary popular culture and significantly contribute to the continued oppression of African-American women. Research for this project was supported by an Undergraduate Research Fellowship.

9:30 – 9:45 a.m. *Jazzing it up: Evolution of the clarinet's role within early jazz to modern jazz-inspired classical works*

Commonwealth

****Stephanie Mora, Dr. Lori Baruth, Mentor, Department of Music, Theatre and Dance, Caudill College of Arts, Humanities and Social Sciences***

Very few people realize how important the role of the clarinet was in the early stages of jazz music. The blending of European instruments and African rhythmic syncopation and tonal style laid the foundation for Ragtime and Dixieland in the Southern American states. The clarinet was at the forefront of these early jazz styles, embellishing harmonies, connecting the sounds of the trumpet and trombone, and producing melodic lines in early Dixieland bands. The function and role of the clarinet in the jazz idiom has changed drastically through the past hundred years. It evolved from being commonly used by early Jazz genres (Ragtime, Dixieland, Blues, and later Big Band Swing) to taking a secondary role to the saxophone as primary melody carrier. It was not until 20th century composers George Gershwin, Artie Shaw and Aaron Copland began recreating a jazz sound in their works that the clarinet re-emerged into the jazz scene once again. When Gershwin wrote his opening to "Rhapsody in Blue," not only did it create a virtuosic solo for clarinet repertoire, but it featured the clarinet in a setting that had not been done before--jazz clarinet in the orchestra. This ground breaking technique spurred other composers during the era to follow suit and create their own jazz-inspired classical works with clarinet highlights. This research was supported by an MSU Undergraduate Research Fellowship.

9:45 – 10 a.m. *A brief clash of influence: The Keats and Audubon Investment*

Commonwealth

****Sosha Pinson, Dr. Philip Krummrich, Mentor, Honors Program, Department of International and Interdisciplinary Studies, Caudill College of Arts, Humanities and Social Sciences***

A storytelling of the interactions of George Keats and John James Audubon in Henderson, Kentucky: the failed business venture, how that affected those around them (specifically John Keats), and a biographical perspective of the voices of George and Audubon and their wives, Georgiana and Lucy.

10 – 10:15 a.m. *Trombonium: The art of doubling on euphonium and trombone*

Commonwealth

****John Handshoe, Drs. Stacy Baker and William Mann, Mentors, Department of Music, Theatre and Dance, Caudill College of Arts, Humanities and Social Sciences***

In this project, research has been conducted through applied study, survey, and interview of renowned euphonium and trombone doubling artists. This research has resulted in exercises and etudes compiled in a book, titled "Trombonium: The Art of Doubling on Euphonium and Trombone," to be used for preparing musicians to double on euphonium and trombone, while maintaining the distinct sound and playing characteristics unique to each instrument. This research is supported by a Morehead State University Undergraduate Research Fellowship.

10:15 – 10:30 a.m. *Break*

10:30 – 10:45 a.m. *The development of moral agency and movement towards perpetual peace in the narrative of Equiano*

Commonwealth

****Daniel Mattox, Dr. Ric Caric, Mentor, Department of International and Interdisciplinary Studies, Caudill College of Arts, Humanities and Social Sciences***

My undergraduate research project considers the development of moral agency as it occurs for Olaudah Equiano. This is of particular importance because Equiano has recently been considered for canonization and has a complete story of his development as a rational agent captured in slavery. This development of moral agency connects to the political field because of its indication of the development of perpetual peace. The Undergraduate Research Fellowship with the Interdisciplinary and International Studies Department allowed me to put together this paper on Equiano and Kant.

10:45 – 11 a.m. On the path from planning to programming: Art events management

Commonwealth

***Alaina Rhinesmith, Jennifer Reis, Mentor, Department of Art and Design, Caudill College of Arts, Humanities and Social Sciences**

The Undergraduate Fellowship in Art Events Management focuses on the conception, logistical planning, marketing, and management of arts programming. Working within the arts programming hosted by the Claypool-Young Art Gallery in the Department of Art and Design, UR Fellow Alaina Rhinesmith was heavily vested in events during the 2010-11 academic year, including the first annual Craft Bizarre (of her own conception), nine exhibitions, and visiting artist programming. Her work on these projects included PR/marketing, hosting special evening and weekend events, co-curating future shows, exhibition design and installation, and event planning and troubleshooting. Through the programming at MSU as well as the Craft Bizarre and research on the business of art, She has become familiar with both for-profit and nonprofit art sectors. This fellowship is designed to prepare a student to begin a career in arts administration or to pursue a degree in arts administration, museum studies, or an MFA in studio art. This project is supported by the Undergraduate Research Fellowship Program, the Department of Art and Design, and the Caudill College of Arts, Humanities and Social Sciences.

11 – 11:15 a.m. Exploring the creative process of musical composition through *The Artist's Way*

Commonwealth

***Tyler Kline, Dr. Deborah Eastwood, Mentor, Department of Music, Theatre and Dance, Caudill College of Arts, Humanities and Social Sciences**

The creative impulse to compose music can at times be elusive. Commissioned composers are required to create original music under the pressure of firm deadlines. As with literary writers, this type of pressure may lead to decreased creativity – even creative blocks. *The Artist's Way* by Julia Cameron is a 12-week program that she describes as "a spiritual path to higher creativity." This project utilized creative writing and compositional exercises designed to stimulate increased compositional productivity. A blog was kept tracking progress and ideas, and compositions were rehearsed and performed, yielding composer-performer interaction. Compositions were performed at the MSU Department of Music, Theatre and Dance Student Recital and the 2011 Kentucky Music Educators Association In-Service Conference. This research was supported by an MSU Undergraduate Research Fellowship.

11:15 – 11:30 a.m. Senora Tortuga: Costume, props, and set design

Commonwealth

***Cara S. Hall, Denise Watkins, Mentor, Department of Music, Theatre and Dance, Caudill College of Arts, Humanities and Social Sciences**

Each spring, a group of Morehead State University students travels with The Little Company to bring Children's Theatre to thousands of elementary students across Kentucky. New to 2011, a student was also responsible for costumes, props, and set design for the bilingual children's show *Senora Tortuga*. The student pulled elements from Frida Kahlo's Day of the Dead paintings to create a unified design concept. Rudimentary lines and bright hues were repeated to give the show both a Mexican folk-art and child like feel. A rigorous research, design, and collaboration process was followed by three weeks of tedious construction. Fourteen costumes, 10 masks, one puppet, plus all set and props pieces was completed during this time. The Little Company is supported by the W. Paul and Lucille Caudill Little Foundation, Morehead State University's Center for Regional Engagement, Caudill College of Arts, Humanities and Social Sciences, and Department of Music, Theatre and Dance.

Concurrent Session – Eagle Meeting Room

9 - 9:15 a.m. **A comparison of multiple versions of Rook**

Eagle Meeting

****Lauren May, Dr. Doug Chatham, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology***

Rook is a popular trick-taking card game in which the winner is determined by the number of point cards obtained throughout the game. Many different versions of the game are popular, and depending on the version, probabilities and strategies may differ. In this study, basic statistical methods are employed to analyze probable outcomes and suggested strategies to optimize game-play across multiple versions of the game. This research was supported by an MSU Undergraduate Research Fellowship.

9:15 - 9:30 a.m. **Going beyond the Hollinger system: Using advanced mathematics to rank NBA teams**

Eagle Meeting

****Greg Warders, Dr. Chris Schroeder, Mentor, Department of Mathematics, Computer Science and Physics, College of Science & Technology***

The only popular mathematical way of ranking NBA teams is the Hollinger Power Rankings system. This system works well, but it consists mainly of simple mathematical operations. A paper, titled *The Perron-Frobenius Theorem and the Ranking of Football Teams* by James P. Keener, ranks college football teams using several advanced mathematical formulas. Using the nonlinear scheme from this paper as a basis, I rank all 30 of the teams in the NBA taking into account several types of criteria.

9:30 – 9:45 a.m. **Crafty connections**

Eagle Meeting

****Sosha Nicole Pinson, *Beth Anne Harris, Dr. Dora Ahmadi, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology***

Difficult mathematical concepts have been hard to understand for tactile learners for many years. Recently crochet has been used to display aspects of hyperbolic geometry that had been only available through visual aids from computers. Taking influence from these projects, we applied the properties of crochet in a mathematical context, specifically in the goal to create a fractal image through granny squares.

9:45 – 10 a.m. **Significant digits and tile occurrence in Hextile Knot Mosaics**

Eagle Meeting

****Drew J. Pearson, Michael Blankenship, Dr. Robin Blankenship, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology***

There are 230 combinations of radius one hextile knot mosaics possible when using the 27 different hextiles. The number of hextile knot mosaics for radius two skyrockets to over 63 trillion. It turns out both of these numbers contain factors of three and four prime numbers, respectively. The objectives will be: (1) finding the number of mosaic combinations for hextile mosaics of radius larger than two through C# computer programming, (2) whether the pattern of prime factors continues with the third and fourth radii, and (3) the amount of times each of the 27 tiles are used during each combination calculation.

10 – 10:15 a.m. Utilizing hodge theory to rank base stations in the 4G mobile network

Eagle Meeting

***Joshua G. Bradley, Dr. Sherif Rashad, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology**

In this presentation, we present a novel base station ranking technique currently under development that will support the network management of the new generation of mobile networks, in an effort to enhance the mobility experience for each mobile user. This technique involves the application of Hodge theory to fixed nodes (considered to represent a base station in the mobile network) in the mobile network in order to obtain a global ranking of base stations based upon the traffic flow between the base stations. Hodge theory provides a way to obtain this global ranking of edge flows from sparse graphs by decomposing pairwise rankings into two orthogonal components, a gradient flow and a divergence free flow, which acts as a measure of “confidence” on the global ranking of the edge flow. It also relates information as to why a global ranking of an edge might be unobtainable. This technique will incorporate factors such as network traffic flow, cluster density, and link-structure based link prediction results. Funding for this research was provided for by the MSU Undergraduate Research Fellowship Program.

10:15 – 10:30 a.m. Break

10:30 – 10:45 a.m. A mathematics dual-credit project

Eagle Meeting

***Julie Lang, Dr. Dora Ahmadi, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology**

The presenter will discuss results from a project aimed at preparing high school seniors for college level mathematics. The project used the Hawkes Learning System to increase the interest and active participation of high school students during a three-year project. This research was kindly funded by the Undergraduate Research Fellowship Program.

10:45 – 11 a.m. Division 1 college football rankings based on margin of victory

Eagle Meeting

***Evan Boyd, Chris Schroeder, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology**

The ranking of college football teams is a highly debated topic. The majority of concerns stem from rankings and the systems used to compute this information. In this presentation, I will show how a particular system, the Colley Matrix method, uses simple statistics to say which team is “better” than another. Using wins and losses along with an implementation of margin of victory among teams played (their average points scored a game compared to their average points against them), we will attempt to decipher which team will be ranked number one when it’s time for the National Championship game.

11 – 11:15 a.m. Hex-stick Mosaics of $(p,p+1)$ -Torus Knots

Eagle Meeting

***Zachary Wagner, Jessica Smith, Dr. Robin Blankenship, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology**

Hextile knot mosaics are converted to hex-stick mosaics by straightening the strands of rope that lay on each hextile. Hex-stick mosaics of $(p, p+1)$ -torus knots were constructed to investigate a lower bound on the number of sticks a particular torus knot would require when embedded in a hex-stick mosaic. The first objective is to use the bridge number of the torus knot to determine a lower bound on its hex-stick number for $p \geq 2$, and the second objective is to use the hex-stick number to obtain a lower bound on the size of hextile knot mosaic needed to embed a $(p,p+1)$ -torus knot for $p \geq 2$.

11:15 – 11:30 a.m. Model development for lignocellulosic biofuels

Eagle Meeting

****Amir Ahmadi, Dr. Michael Dobranski, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology***

Second generation biofuels (biofuels from various types of biomass) hold a prominent role in current clean energy research. This presentation illustrates the economic and physical feasibility of bio-oil production from a fluidized bed reactor given a wood input's physical and cost characteristics. This project is supported by an Undergraduate Research Fellowship.

Concurrent Session - Riggle Room

9 - 9:15 a.m.

An improved measurement of the diffuse x-ray background: The cosmic x-ray background nanosat (CXBN)

Riggle

****Tyler G. Rose, Dr. Benjamin K. Malphrus, Kevin Z. Brown, Mentors, Department of Earth and Space Science, College of Science and Technology***

CXBN is a 2U CubeSat accepted by NASA's ELaNa program devoted to making improved measurements of the X-Ray background with a detector system based on a Cadmium Zinc Telluride array. These measurements have the potential to provide insight into underlying physics of the early universe. MSU is responsible for the engineering of all spacecraft subsystems, and the detector is being designed by UC Berkeley, Lawrence Livermore National Laboratory, and Noqi Aerospace. CXBN will feature many unique systems, including sun sensors, a star sensor system, an ARM-7 Coretex processor, and an articulating solar array. The project commenced in early 2011, with launch planned for early 2012. MSU will also provide ground operations for the mission utilizing the 21 Meter Space Tracking Antenna and other ground assets.

9:15 - 9:30 a.m.

A multi-wavelength study of the galactic supernova remnant CTA 1

Riggle

****Emily J. Goff, Caleb K. Grimes, Joshua M. Tussey, Dr. Thomas G. Pannuti, Mentor, Department of Earth and Space Science, College of Science & Technology***

We present a multi-wavelength study of the Galactic supernova remnant (SNR) CTA 1. Our analysis focuses on radio and x-ray emission and is based on data collected by the Chandra X-ray Observatory, the ROSAT X-ray Observatory, the XMM-Newton Observatory, Morehead State University 21-Meter Space Tracking Antenna operating at 1.4GHz. The radio emission is located along the southern and eastern portions of the SNR. CTA also consists of a central bridge of radio and X-ray emission produced by a shock-heated interior plasma and a central pulsar. X-ray spectra were extracted at multiple regions of the SNR to search for variations in the characteristics of the X-ray emitting plasma. The results of this analysis are presented and discussed. Funding for this project was received through the Kentucky NASA EPSCoR Research Infrastructure Development Program.

9:30 – 9:45 a.m. Development of a femto-satellite orbital deployer (FOD) and microsatellite for research and education

Riggle

****D. Clay Graves, Tyler Rose, Brandon Molton, Nathan Fite, Dr. Benjamin K. Malphrus, Robert Twiggs, Mentors, Department of Earth and Space Science, College of Science and Technology***

EduSat - an innovative Microsatellite (12 kg) will be launched in 2011 from Yasny Russia on a Dnepr Launch Vehicle. After a period on orbit, EduSat will test an orbital deployer developed at Morehead State University designed to release femto-class (< 1 kg) satellites. A follow-on mission in 2012 will deploy four femto-class satellites including two developed at MSU. The missions are designed to provide educational and research opportunities for students at the University of Rome Sapienza and Morehead State University. Students at MSU had the responsibility of designing the deployers' mechanical systems, electronics systems, software systems, and will operate the satellites on orbit. A timeline and expected results of the project will be presented.

9:45 – 10 a.m. *A search for x-ray counterparts to supernova remnants in the galaxy NGC 4258 (M106)*

Riggle

****Caleb K. Grimes, Dr. Thomas Pannuti, Mentor, Department of Earth and Space Science, College of Science and Technology***

We present a search for X-ray candidate supernova remnants (SNRs) in the nearby spiral galaxy NGC 4258. This galaxy exhibits dense arm structures associated with high star formation regions. SNR candidates are proposed due to increased count-rates of X-ray photons from localized regions that are coincident with these dense gaseous arms observed by Spitzer at 8 μ m or coincident with radio SNR candidates reported by Hyman et al. (2001). Spectra are extracted from these candidates to reveal emission properties of regions and further solidify SNR candidates with fittings that support that of SNR models. Preliminary results support the possibility of X-ray luminosities comparable to the luminous galactic SNR Cassiopeia A. Further results will be discussed. Support for this project comes from the Department of Defense.

10 – 10:15 a.m. Developing VHF/UHF and S-Band antennas for cubesats

Riggle

****Nathan Fite, Dr. Benjamin Malphrus, Kevin Brown, Jeff Kruth, Robert Twiggs, Mentors, Department of Earth and Space Science, College of Science and Technology***

Cubesats are a pico-class (1-3kg) of satellites utilized as an inexpensive means in which to get to space. The small size of these satellites restricts the use of conventional antenna systems; therefore, an innovative antenna design is required. This study will discuss a practical solution driven by design criterion. Results will be presented by both empirical measurements and modeling by software.

10:15 – 10:30 a.m *Break*

10:30 – 10:45 a.m. Advanced fuel cell vehicle concept and design

Riggle

****Darin Vaughan, Drs. Sadeta Krijestorac and Kent Price, Mentors, Department of Applied Engineering and Technology, Department of Mathematics, Computer Science and Physics, College of Science and Technology***

An issue with utilizing fuel cells for vehicle power plants is the problem of molecular hydrogen storage inefficiency, which causes a max range of 100-200 miles for current commercial fuel cell vehicles. Two concepts have been designed to counter this issue through fuel waste reprocessing. The first and original design incorporates an energy dense battery coupled with a high temperature electrolytic cell to reform the waste water into H₂ gas, adding greatly to the range. Design two uses mostly the same process, but utilizes a hydrocarbon, which stores at densities several orders of magnitude higher, and although much more complicated to reprocess, it will provide a range that could be unmatched by even gasoline vehicles. Funding is expected from Idea State University competition as well as probable venture capitalist grants.

10:45 – 11 a.m. FlatSat, an engineering model of KySat-1 for systems development and space science education

Riggle

****Brandon L. Molton, Dr. Benjamin Malphrus, Jeff Kruth, and Robert Kroll, Mentors, Department of Earth and Space Science, College of Science and Technology***

A functional “FlatSat” version of the KySat-1 picosatellite has been developed to enable students and faculty at the Space Science Center to engineer CubeSat systems based on the KySat-1 bus as well as to develop ground stations capable of controlling KySat-1 systems. FlatSat changes the standard “stacked” form factor into a flat form factor making systems development easier. This layout also benefits the study of satellite systems due to the ease of access to the key components; allowing students to easily study system designs. FlatSat was inspired by NASA engineering techniques that use “flat satellites” to develop major satellite programs. FlatSat has been used for calibration of the SSC VHF/UHF Earth station and to test variations of subsystems to be integrated into future versions of MSU small satellites.

11 – 11:15 a.m. Monitoring of three blazars using the Morehead State 21 meter Space Tracking Antenna

Riggle

****Joshua M. Tussey, Caleb Grimes, Emily Goff, Benjamin Cahall, Will Moffit, Dr. Thomas G. Pannuti, Mentor, Department of Earth and Space Science, College of Science and Technology***

We present a monitoring study of three active galactic nuclei (AGN) utilizing the Morehead State 21 meter Space Tracking Antennae (STA). These AGNs (3C 454.3, BL Lac, and CTA 102) are blazars, which are AGNs that are observed such that the characteristic relativistic jet is oriented directly toward Earth. A campaign of observations were taken using the STA and data was reduced using an algorithm that compares measured voltages for the blazars with voltages measured for standard flux calibrators. The resultant flux densities were then compared to reported values of the flux density for each source as listed within the NASA/IPAC Extragalactic Database (Ned) and referenced publications to investigate the presence and magnitude of variations. Radio light curves were also prepared for comparative purposes.

11:15 – 11:30 a.m. Creating a CubeLab greenhouse kit to provide hands-on space project for high school STEM initiative

Riggle

****Julia O'Brien, Robert Twiggs, Mentor, Department of Earth and Space Science, College of Science and Technology***

Increasing the STEM knowledge base of K-12 students is fundamental to the next generation U.S. workforce and this particular project attempts to create a type of nanosatellite, specifically a 1.5 unit (10cm X 15cm x 10cm) CubeLab greenhouse kit that high school students could use as a model for performing scientific research in microgravity. This kit would provide students with structural and payload designs, and include such parts as the external aluminum box, internal polycarbonate box, the enclosed greenhouse, a microcontroller, temperature sensors, LED lighting, and the fluid (injection) and imaging systems. This project is supported by an Undergraduate Research Fellowship and serves as a possible contribution to the SpaceLab STEM initiative through Kentucky Space.

11:30 – 11:45 a.m. Solar radiation measurements for Eastern Kentucky

Riggle

****Brandon Scott White, Dr. Hans Chapman, Mentor, Department of Applied Engineering and Technology, College of Science & Technology***

The need for reliable region-specific solar irradiance data has become urgent as solar energy technology gains attention. Agencies such as the National Renewable Energy Laboratory (NREL) provide general solar radiation resources for the United States. However, there is only a limited amount of solar resource data specific for the Eastern Kentucky region that will assist developers engaged in the installation of green technologies.

This research seeks to characterize measurements of solar radiation in the region, using MSU as a test site. A designed experiment approach will be employed for acquiring data prior to analysis. The data to be collected will then be analyzed and compared with those based on calculations. This research is supported by the MSU Undergraduate Research Fellowship and a grant provided by the MSU Office of Research and Sponsored Programs.

P. 1. The impact of student-led philanthropy courses on student learning outcomes**Crager******Jennifer Wells, Dr. Janet Ratliff, Mentor, School of Business Administration, Department of Accounting, Economics and Finance, College of Business and Public Affairs***

The purpose of this research study was to explore the impact of student-led philanthropy courses on learning outcomes related to students' sense of civic engagement and philanthropic giving. Additionally, it looked at future trends in service and volunteerism, philanthropic giving, alumni participation, and community involvement as a result of participation in the Pay it Forward: Student-Led Philanthropy Initiative.

The study employed quantitative research methods, specifically survey design (prepared in collaboration with the Sillerman Center for the Advancement of Philanthropy at Brandeis University and the National Campus Compact Office). Descriptive statistics, inferential statistics, and *t*-tests were the analyses used. This project is funded through a Learn and Serve Grant via Kentucky Campus Compact with additional funding provided by Morehead State University's Center for Regional Engagement.

P. 2. Using visual art to guide K-12 students through energy based service learning**Crager******Megan Lindsey, April Haight, Mentor, School of Public Affairs, Center for Environmental Education, College of Business and Public Affairs***

Using the Earth Force curriculum for Community Action and Problem Solving, a visual was created to guide students through an exploratory process to learn about energy in Kentucky. The illustration serves as a pictorial for students to explore energy issues, uses, and conservation. The visual aid connects these energy objectives to show the power of student voice and the connection to community resources. It also serves as a guide to the process of research, evaluation, and student action to solve an energy problem. This project is funded with a grant from The Corporation for National and Community Service.

P. 3. Relationship between land use/land cover change and flooding in the Triplett Creek floodplain**Crager******Jocelyn Gross, Dr. Christine McMichael, Mentor, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs***

Land use and land cover change (LULCC) has been shown to affect flooding dynamics in many areas; however, few studies have been conducted in small, rural communities like Morehead, Ky. This study investigates LULCC and flooding dynamics within the Triplett Creek floodplain (from Christy Creek to Dry Creek) in Morehead, Ky., from 2002-10. LULCC in this floodplain was assessed over the study period by manually digitizing land use/land cover polygons for a time series of true color NAIP aerial photographs. The frequency of floods in the area was established for each year during the study period using various sources including local newspaper archives. These data were then used to assess the relationship between LULCC and flooding in the Triplett Creek floodplain during the study period.

P. 4. Socio-economic characteristics of Rowan County’s floodplain vs. non-floodplain areas

Crager **Jocelyn Gross, Dr. Christine McMichael, Mentor, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs*

Many studies have investigated whether socioeconomic inequalities exist between people living in environmentally vulnerable areas of a community and those who do not. Similarly, this study examines the socioeconomic characteristics of those living in Rowan County’s floodplain areas with those who do not – all within the context of three other Kentucky counties characterized by different socio-economic conditions: Fayette, Menifee, and Montgomery. U.S. Census data, PCensus software, and digital FEMA floodplain maps were used to assess population characteristics in four zones: floodways, 100-year floodplains, 500-year floodplains, and non-floodplain areas in Rowan County. These results are compared with those from the other three counties in order to identify similarities and differences between those living in floodplain areas and those living outside of them.

P. 5. Quality of life and economic condition: A comparative county analysis

Crager *Ashley Adkins, Jocelyn Gross, *Cory Owens, *Tony Pence, William Scaggs, and Morgan Stratton, RAPP 300: Seminar in Regional Issues I, Drs. Christine McMichael and Stephen Lange, Mentors, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs*

Previous RAPP 300 projects have found that “quality of life” is vitally important to leaders and residents when they reflect upon their community’s economic progress. While this makes sense intuitively, we wanted to understand more clearly what quality of life is and what its relationship is to economic status. We investigated relationships between 14 quality of life measures and economic condition for a group of five rural Kentucky counties, each of which had experienced different economic conditions since 1960. Results from our analysis suggest that utility, public safety and education measures are most closely tied to county economic conditions in our study area; other measures were less linked to quality of life. This project was funded in part by the ARC-sponsored Appalachian Teaching Project.

P. 6. The impacts of executive policy implementation on intergovernmental relations

Crager **Kaci Foster, Dr. Michael W. Hail, Mentor, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs*

This study examines the relationship of intergovernmental management to the constitutional structures of federalism. This study includes theoretical as well as empirical data. The research utilized content analysis and database coding to examine archival documents and assess intergovernmental management of federalism through regulatory enactments. Research activities included interviews with policy makers in Washington D.C., as well as archival research at the Library of Congress. One significant outcome from this research has been a Congressional Research report inspired by the federalism questions of this study. Preliminary findings suggested agency rulemaking holds a significant influence on federalism policy.

P. 7. Federalism: From the Articles to the Constitution

Crager **Autumn B. Baker, Dr. Michael W. Hail, Mentor, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs*

This study examines the changes to sovereignty for the states as the nation transitioned from the Articles of Confederation to the 1787 Constitution. The research utilized content analysis to examine archival documents to assess the balance of federalism through the transition from the Articles. Research activities included interviews with policy makers in Washington D.C., as well as archival research at the Library of Congress. Preliminary findings suggested limited influence on current issues but significant, if underappreciated, structural influence from the Articles and the associated transitional federalism.

P. 8. A patchwork of restrictions: Does stricter state regulation of abortion make a difference?

Crager **Evetta Shawntal Wilks, Jonathan Pidluzny, Mentor, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs*

Although the Supreme Court of the United States has ruled that states cannot prohibit abortion, states do retain the right to place a considerable array of restrictions on the practice. This has led to immense variation in the restrictions governing abortions among the states. In addition to cataloguing the laws restricting abortion on a state-by-state basis, this study inquires into the effect of those regulations on the prevalence of abortion in high-restriction states. In addition to asking whether the restrictions are making a difference, this study seeks to identify other variables that affect the prevalence of abortion in a state. An MSU Undergraduate Research Fellowship supported this project.

P. 9. Insuring America: The impact of President Obama's Affordable Care Act on the states

Crager **James T. Galbreath, Jonathan Pidluzny, Mentor, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs*

President Obama's 2010 Affordable Care Act promises to reshape America's healthcare system. The law will make it possible for millions of currently uninsured Americans to afford coverage by providing subsidies for the purchase of private insurance, and by mandating the expansion of state-run Medicaid and CHIP programs. An estimated \$358 billion will be paid out in subsidies by 2019, and an estimated \$434 billion will be provided to the states to expand Medicaid and CHIP. This study investigates the costs and benefits of the Affordable Care Act on a state-by-state basis, with a focus on the southern states, primarily Kentucky. How many Kentuckians will benefit from the law, and at what cost to the state budget? An MSU Undergraduate Research Fellowship supported this project.

P. 10. NAFTA: Success or failure?

Crager **Laken Gilbert, *Lauren VanHook, James Masterson, Mentor, School of Public Affairs, Department of Government and Regional Analysis, College of Business and Public Affairs*

The North American Free Trade Agreement was based on Canada, the United States and Mexico attempting to grow by using each other. This trilateral trade bloc is designed to create a unique and profitable relationship, but not necessarily an equal partnership. Our project researches the expectations behind NAFTA's creation and analyzes whether those expectations were fulfilled.

P. 11. How do good apples grow from good seeds?: Exploring social entrepreneurs' moral imagination strategies

Crager **Sara Bradley, Dr. Lindsey N. Godwin, Mentor, School of Business Administration, Department of Management and Marketing, College of Business and Public Affairs*

Social entrepreneurs create ventures that provide mutually beneficial outcomes for business and society by translating their moral imagination into action. Prior research has focused primarily on personal characteristics of social entrepreneurs; thus we know little regarding their influence on the strategic development of their ventures, or how they translate their values into an ethical business approach. This study sought to explore the strategies social entrepreneurs employ to actually achieve mutually beneficial goals. We analyzed the 155 organizations in Schwab Foundation's 2010 list of social entrepreneurs. Using inductive thematic coding, we categorized each venture based on the founders' moral motivation, the organizational mission, and organizational strategy. Primary findings include eight different social entrepreneurial strategies. This research was supported by the MSU Undergraduate Research Fellowship program.

P. 12. Student-athletes' perceptions and concerns regarding the use of social network media

Crager

****Evan Worrell, Adora Miller, Dr. Steve S. Chen, Mentor, School of Business Administration, Department of Management and Marketing, College of Business and Public Affairs***

Recently, numerous controversies and discussions have centered on the inappropriate use of the social network media (SNM) by collegiate student-athletes. Many cases highlighted how athletes received suspension or lost scholarship due to posting inappropriate contents on their personal webpages. To identify more effective strategies for regulating the use of SNM, this study examined 146 student-athletes' perception and concerns toward the issue. The respondents' perception were categorized into five factors: (1) regulations and policies for control; (2) use-pattern and behavior; (3) discussion on athletic-related information; (4) concerns toward posted contents; and (5) benefits and confidentiality. Overall, the respondents gave positive feedback regarding the function of SNM, but did not support the concept of monitoring the contents by the athletic staff.

P. 13. Collegiate sports fans' perceptions and expectations toward the personal seat license program

Crager

****Evan Worrell, Adora Miller, Drs. Kenneth Henderson and Steve S. Chen, Mentors, School of Business Administration, Department of Management and Marketing, College of Business and Public Affairs***

Many universities across the country have adopted a personal seat license program as a means to increase revenues of their athletic departments. This study disclosed the responses of 239 collegiate basketball spectators' perception toward the implementation of personal seat license (PSL) programs. In addition, the benefits and concerns for implementing the programs were discussed. Results suggested that respondents' willingness to purchase a PSL package was best predicted by provided tangible and intangible benefits (i.e., ticket discount, food services, and social affiliation) and team identification. Overall, the respondents did not favor the idea of implementing PSL programs in a mid-size regional institution.

P. 14. Get fit to profit: Implementation of wellness programs in work settings

Crager

****Shelley Kouns, Brian K. Nunn, Kaitlin Parsons, Drew Morgan, Dr. Steve S. Chen, Mentor, School of Business Administration, Department of Management and Marketing, College of Business and Public Affairs***

This presentation addresses the needs and concerns for implementing a wellness program in business corporations and working environment. By using an educational institution's wellness program as a model, the presenters will address three specific areas to achieve the desired health goals: (1) Practical implication and strategies for planning and operation of the programs; (2) motivation and retention of members (employees); and (3) members' program preferences. The primary learning objective is to help the administrators recognize the benefits and challenges of operating a wellness program in work settings. Thus, a functional wellness program can be implemented to enhance the employees' health and productivity.

P. 15. Arts and humanities advertising and public relations campaign

Crager **Lauren E. Newell, Dr. M. Scott McBride, Mentor, Office of the Dean, Caudill College of Arts, Humanities and Social Sciences*

The purpose of this study is to investigate the use of different media outlets for deciding the most efficient ways to contact MSU alumni, current on-campus students, commuters, and community members about upcoming arts, humanities and social science events. The research, which began August 2010 and ended spring 2011, has given information on the success of e-marketing campaigns, allowing the Arts & Humanities Council at MSU to properly reach the intended audience in the most superlative way. The findings were applied through the creation of weekly event notifications, and then implemented through e-marketing campaigns. A permanent weekly event notification layout has been designed and research for contemporary e-marketing outlets has been collected. An MSU Undergraduate Research Fellowship supported this research.

P. 16. Building a soda kiln and exploring glazes

Crager **Abigale Brading, Amy Fannin, Matthew Rand, Seth Green, Mentor, Department of Art and Design, Caudill College of Arts, Humanities and Social Sciences*

The foundation of this project is to increase volunteer experiences within the community, establish external partnerships with regional high schools, and to provide a tool that creates opportunities for students to explore new glazing techniques within the ceramic arts. Building a kiln requires several stages of planning before construction. Current progress is focused around site preparation, securing funds for materials and hardware, construction methods, and glaze formula research. Upon completion in June 2011, college and high school students will work collaboratively to draw awareness to the opportunities provided by Morehead State University. This project was made possible by funding from the Center for Regional Engagement: "New Faculty Start-Up Fund," the Undergraduate Research Fellowship Program, and the Department of Art and Design.

P. 17. DOVES "Speak up" to eliminate domestic violence doggy derby

Crager **Meredith York, *Kara Barthel, Dr. Janet Rice McCoy, Mentor, Department of Communication, Media, and Leadership Studies, Caudill College of Arts, Humanities and Social Sciences*

Since 2008, advertising and public relations students have worked with Domestic Violence Emergency Services (DOVES) of Gateway on a continuing service-learning project. In the first year, students in the public relations campaigns course designed a new logo and developed a rebranding campaign for DOVES. In the second year, students in the campaigns course planned a fundraising event for the shelter. In the third year, for their senior project, students in the advertising and public relations capstone course implemented the DOVES Doggie Derby to educate the public and raise funds for the nonprofit organization. This project was supported by an Undergraduate Engagement Fellowship from the Center for Regional Engagement—the fellow served as the project coordinator for the event.

P. 18. Coming out in Appalachia

Crager **Joshua Mabry, Dr. Ann Andaloro, Mentor, Department of Communication, Media and Leadership Studies, Caudill College of Arts, Humanities and Social Sciences*

This research project explores the experiences of gay and lesbian students in Eastern Kentucky. This project also interviews two ministers, one of them being a lesbian. Other interviews include gay/lesbian faculty members of Morehead State University, with some being active members of the church. The interviews were videotaped and are being edited for a program proposed to KET. This project is important because it presents the life experiences of a diverse population, while also bringing important social issues to the forefront. The project also explores the hopes and dreams of these students for the future. This research was supported by an MSU Undergraduate Research Fellowship.

P. 19. The English education center community connection, a liaison between the university and regional educators

Crager *Tina Leffingwell, Kathryn Mincey, Mentor, Department of English, Caudill College of Arts, Humanities and Social Sciences*

In association with the EEC undergraduate research fellows, the English Education Center and website has seen much progress in an attempt to engage teachers in the region, to provide them with materials for classroom use, and to allow them to contribute materials. Building onto the past research, the website has been updated with useful links and a blog for open use. The major project for the year will be a conference at the end of May. It will be an opportunity for regional English educators to present their finest work. Ideally it will be the first annual conference for Morehead State. All efforts have been supported by Morehead State's Center for Regional Engagement who provided the grant to the English Education Department.

P. 20. Reverse ekphrasis

Crager *Adam Wheeler, Crystal Wilkinson, Mentor, Department of English, Caudill College of Arts, Humanities and Social Sciences*

"Ekphrasis: a literary description of or commentary on a visual work of art" Merriam-Webster's Collegiate Dictionary. Springfield, 2003.

Writers submitted works of poetry or prose which were then interpreted by musicians and visual artists. Some of our goals were to encourage collaboration between the arts and provide writers with a way to see their work through the reader's eyes. The project culminated with a reading of the poetry and prose, a performance of the musical work, and an exhibit of the visual interpretations. Support for Reverse Ekphrasis was provided by MSU's Department of Art and Design, BFA Creative Writing program, and an Undergraduate Research Fellowship.

P. 21. Pre-service curriculum alignment and instructional support for Kentucky English teachers

Crager *Joshua Blevins, Kathryn Mincey, Mentor, Department of English, Caudill College of Arts, Humanities and Social Sciences*

This ongoing project began four years ago with a statewide survey of Kentucky English teachers to determine the literary texts most commonly taught in grades 8-12. Results are posted at <http://www.moreheadstate.edu/eec/>. That research has enabled Undergraduate Research Fellows to develop and post resources for teachers at the online MSU English Education Center and, with the support of a Regional Engagement Grant, to upgrade materials in the resource center on campus for teachers. The fellows also have assisted in presenting research-based professional development workshops at conferences for teachers and locally for teacher-candidates. The project has been supported by both an IRAPP Regional Engagement Grant and the Undergraduate Research Fellowship program and has been presented at the Kentucky Council of Teachers of English/Language Arts Conference.

P. 22. Designing engagement opportunities for students through a collaboration with Legal Aid of the Bluegrass

Crager **Jacob Chapman, Kelly Collinsworth, Mentor, Department of History, Philosophy, Religion and Legal Studies, Caudill College of Arts, Humanities and Social Sciences*

This fellowship supported the investigation and creation of engagement opportunities where MSU legal studies students would provide legal assistance to low-income residents of our area. Legal Aid of the Bluegrass, a local nonprofit civil legal service provider, was identified as a community partner in this project. Three areas for legal assistance were identified: divorce clinics, foreclosure clinics, and a benefits/elder law clinic. This research was funded by a Regional Engagement Fellowship.

P. 23. Obstacles to study abroad

Crager **Kayla Burton, Dr. Philip Krummrich, Mentor, Department of International and Interdisciplinary Studies, Caudill College of Arts, Humanities and Social Sciences*

We are interested in more fully understanding the obstacles that American honors students face while studying abroad. As many students show an interest in studying abroad only a small percentage participate in a study abroad program. By analyzing the research previously done by others and sending out surveys to honors directors and students across the country, we hope to gain more knowledge on what fears students harbor about studying abroad. Some of the most common responses were financial concerns and the language barriers one would face while in another country. We are particularly interested in analyzing and offering solutions to how the language barriers affect honors students. I am doing this project as part of my Undergraduate Research Fellowship.

P. 24. New applications of Kodaly, Dalcroze, and Orff for the music classroom

Crager **Blake Huffaker, Dr. June Grice, Mentor, Department of Music, Theatre and Dance, Caudill College of Arts, Humanities and Social Sciences*

Kodaly, Orff, and Dalcroze have provided many different theories involving the music education of young students. Their methodologies have been successful for many years. However, the way in which their activities are presented in the classroom has become outdated. Therefore, it is vital for educators to create new materials or adapt old ones to make them more relevant in today's world. New activities and compositions increase student motivation and allow them to more easily understand concepts. I will review the history of current music methodologies used in public schools. I will then make these methodologies more up-to-date by composing songs, making new Orff-style arrangements, and creating activities that emphasize the principles and concepts of these teaching methods. The created materials will be incorporated into lessons and tested in the classroom to determine their success. Once the materials are completed and tested, I will provide teachers with these updated materials to use freely in the classroom. This research was supported by an Undergraduate Research Fellowship.

P. 25. Determining crime predisposition: A view into social class, Appalachian culture and public opinion

Crager **Staci Mynhier, Dr. Elizabeth Biebel, Mentor, Department of Sociology, Social Work and Criminology, Caudill College of Arts, Humanities and Social Sciences*

Kentucky ranks as one of the most poverty stricken states in the country, with a high level of drug use and crime per capita. The term Appalachian carries a social stigma linked with social class and lack of opportunity. This study is an exploration into public opinion on the definition and determination of social class, what leads to a lack of opportunity and an increased predisposition into crime. This will be the first phase of study, surveying public opinion on crime and examining the statistics of rural Appalachian income and poverty rates, crime statistics and the correlation between opportunity and social class. These studies ask the question, are there bad places, bad people, bad choices, or are we products of our own environments?

P. 26. The trend of professional focus on child nutrition and physical fitness: Analysis on young children in the past 30 years

Crager **Katarina Chalk, Dr. Mee Shon, Mentor, Department of Early Childhood, Elementary and Special Education, College of Education*

In the 1980s, children's nutrition was a big factor to the media. There were also a lot of different play sets and tricycles to choose from. In the 1990s, nutrition lost its place and very few articles of physical activity took its place. We saw more articles about the TV that children were watching and the importance of diversity in a child's life. In the 2000s and present times, less and less articles are about physical activity and nutrition and more about technology.

P. 27. Remembering: Strategies for forgetful students

Crager *Nikki Murphy, Kim Nettleton, Mentor, Department of Early Childhood, Elementary and Special Education, College of Education*

It's no secret that elementary classrooms always have at least one student who is not able to focus on simple tasks. This student could be affected by a learning disability, a behavior disorder, or may just be a mainstream student. It is the teacher's job to generate ideas for keeping those students on task. My study involved four 5th grade male students. Taping a task card to their desk and receiving a reward (or prize) for completing the task resulted in the students participating and carrying out the once forgetful tasks.

P. 28. Embedding triple III instruction of RtI when teaching statewide pre-kindergarten learning standards to children with significant disabilities within inclusive preschool classrooms

Crager **Tiffany Smith, Dr. Sarah Hawkins, Mentor, Department of Early Childhood, Elementary and Special Education, College of Education*

This project shares the results of a single subject study that assessed the effects of embedding triple III instruction of RtI when working towards of pre-kindergarten standards by children with significant disabilities. Teachers in an inclusive public preschool classrooms implemented authentic assessment strategies, selected individualized pre-math objectives, embedded the math objectives in classroom activities, and monitored children's progress. The results show that: a) teachers can reliably teach children with significant disabilities within inclusive classroom activities and b) the children can attain pre-math skills when: a) authentic assessment strategies are employed; b) effective individualized plans are developed; c) embedding consistently occurs; and d) instruction is monitored. This research was supported by an MSU Undergraduate Research Fellowship, the Office of Regional Engagement.

P. 29. Action research: Hallway procedures

Crager **Sarah V. Johnson, Kimberly Nettleton, Mentor, Department of Early Childhood, Elementary and Special Education, College of Education*

This action research project was chosen because of the extensive amount of verbal cues that students are given to remind them of their duties and responsibilities. This is about finding another way to communicate that is more effective than verbal cues. For two weeks, data was collected before the implementation of the visual cues. Data showed that students were reminded an average of 15 times to follow the hallway procedures. Afterwards, visual cues in the form of signs that said "level 0" and "popsicle" (term that had been coined in the particular classroom to get their attention and make them realize that they should stand straight and still) were used. Data collected showed that the average verbal given daily was only three after implementation.

P. 30. Engaging bodies to better engage minds: Can drawing while listening improve comprehension?

Crager **Erin Ashcraft, Kimberly Nettleton, Mentor, Department of Early Childhood, Elementary and Special Education, College of Education*

Our bodies make endless connections and send countless signals when processing new information. For some learners, being engaged in multiple manners may allow the body to make more connections and ultimately better comprehend. Research was conducted with a second grade class to determine if comprehension of a story read aloud would be affected by providing the opportunity for students to have active hands, as well as active minds. Comprehension assessments were compared from three scenarios: listening only, free drawing while listening, and illustrating the story being read or drawing what pictures students created in their minds while listening.

P. 31. Lunch-n-logs

Crager *Sarah Baldwin, Kim Nettleton, Mentor, Department of Early Childhood, Elementary and Special Education, College of Education

Motivating elementary age children to read is often a challenge for many teachers. Reading logs have been an option to require fourth grade students to read outside of school. Many students forgot to do their reading log altogether, or didn't fill out the required number of entries. This became a problem among all four, fourth grade classes. Why were students lacking the enthusiasm to read? This question was analyzed to see if the addition of a reward inspired students to read and complete their logs efficiently, and other options for required reading outside of school were explored.

P. 32. A comparison of literacy interventions utilized in New Zealand and Eastern Kentucky

Crager *Brittany Campbell, Department of Early Childhood, Elementary and Special Education, Kelli Hollenkamp, Drs. Jody Fernandez and Sara Lindsey, Mentors, Department of Middle Grades and Secondary Education, College of Education

The study looked into literacy interventions used in Auckland, New Zealand, and compared them to ones used in Eastern Kentucky with an eye on ascertaining which internationally pedagogically sound teaching practices could be incorporated into Kentucky's curriculum. The researchers collected information regarding the reading intervention methods used in Eastern Kentucky and Auckland, New Zealand, P-8 schools and developed a features analysis to describe and compare them. Site visits to Kentucky and New Zealand schools were enabled by the Boggs Endowment and the COE.

P. 33. Two different approaches to pre-service teacher field experience: A study of academic optimism and teacher locus of control

Crager *Paul Bret May, Matt Moehle and Kim Nettleton, Mentors, Department of Early Childhood, Elementary and Special Education, College of Education

This research explores the effects of pre-service teachers having an enhanced field-experience. In the Immersed semester of the Professional Partnership Network (PPN), candidates are required to complete a total of 448 hours of field experience. During the same semester, non-PPN candidates--who are not Immersed--are required to complete 56 hours of field experience. As a means of determining the effects of participating in an enhanced field-experience a posttest was given to both groups at the beginning of the semester following the Immersed semester. The posttest focused on academic optimism and teacher locus of control. The results of this data were analyzed quantitatively to determine the presence of significant differences among the explored variables.

P. 34. A comparative study of teacher standards from New Zealand to Kentucky

Crager *Kelli Hollenkamp, Drs. Jody Fernandez and Sara Lindsey, Mentors, Department of Middle Grades and Secondary Education, Brittany Campbell, Department of Early Childhood, Elementary and Special Education, College of Education

This presentation compares Kentucky teacher standards to New Zealand teacher standards to determine the difference they make in student achievement. Does the difference in standards contribute to the fact that New Zealand scores considerably higher than the U.S. in literacy tests? For example, Kentucky teacher standards place an emphasis on technology while New Zealand standards consider cultural influences to be important. Additionally, Kentucky teacher standards require teachers to utilize specific tests while New Zealand's teacher standards do not specify the types of assessments that teachers must use. With the support of the Boggs Endowment and the dean of the COE, the researchers traveled to New Zealand to observe and document schools in March and April of 2011.

P. 35. Teaching controversial issues in central Appalachian schools: An examination of personnel policies

Crager **Amie M. Weckenbrock, Dr. Kimberlee A. Sharp, Mentor, Department of Middle Grades and Secondary Education, College of Education*

This study examined a sample of Central Appalachian school districts' personnel policies regarding controversial issues instruction and the protocols teachers must follow when teaching them. Specifically, the study examined the language used in the policies in order to ascertain: (a) school districts' expectations of teachers as controversial issues arise during their teaching; (b) the degree to which school districts may limit, restrict, prohibit, or give free reign to teachers to discuss controversial issues; and (c) the kinds and/ or nature of controversial issues that school districts may limit, restrict, and/or prohibit. Implications of these policies on classroom practice and Central Appalachian students' access to this dimension of citizenship education was also addressed. This research was supported by an MSU Undergraduate Research Fellowship.

P. 36. 3D technology in education

Crager **Karla Spencer, Dr. Lesia Lennex, Mentor, Department of Middle Grades and Secondary Education, College of Education*

Dynamic changes are occurring each day in P-12 schools with the advent of new technologies. With these changes the learning abilities of students change as well. The student's ability to learn today depends on the amount of hands-on interaction and visuals they are provided. We sought answers about the possibility of incorporating 3D technology into school systems. With the testing of a 3D camera, editing software, and commercial products, as well as extensive research on the availability of other programs, we are finding answers. Further, we have field-researched 3D technologies and its uses among P-12 populations in Kentucky. This research was supported by an Undergraduate Research Fellowship.

P. 37. The fantastic four: The efficacy of open response preparation in elementary schools

Crager **Brooke Kendall, Rebecca Roach, Mentor, 21st Century Education Enterprise, College of Education*

Elementary school teachers have struggled with preparing students to address questions written in open response form because the skill-set necessary to answer complex questions in extended written form is often too abstract for students of this age group. The Fantastic Four strategy prepares students to analyze questions and systematically answer the open response questions. This project analyzes data from two elementary schools that implemented the Fantastic Four across the curriculum to determine the impact of professional development in this area.

P. 38. The space movie project: Measuring student learning through imovie rubrics

Crager **Terri Rose, Rebecca Roach, Mentor, 21st Century Education Enterprise, College of Education*

Twenty first century learners are native to technology. Currently through the Dataseam initiative, movie-making resources are available in almost every classroom in the coal seam. However, teachers struggle to integrate movie making to effectively address content standards as opposed to a "fun, stand-alone" activity. This study proposes to measure student learning through the analysis of movie rubrics implemented in the Space Movie Project at Morehead State. This study was supported by funds provided by the Center for Regional Engagement and Dataseam.

P. 39. Stem yield, syrup production, and brix content of sweet sorghum in eastern Kentucky

Crager Sarah Hazenfield, Drs. J. Michael Phillips and Rebecca Miculinich, Mentors, Department of Agricultural Sciences, College of Science and Technology

Sweet Sorghum is a drought-tolerant, C4 grass with a demonstrated high yield potential in Eastern Ky. A study was conducted in 2010 to determine the stem yield, syrup production, and Brix content of nine commercial sweet sorghum (*Sorghum bicolor* (L.) Moench) varieties. The varieties included Dale, Della, SugarDrip, Theis, M81-E, Keller, TOP 76-6, Umbrella, and Simon. Total stem production (wet weight) ranged from 6.93 to 29.95 tons/acre for Umbrella and Keller, respectively. Syrup production ranged from 2.11 to 7.62 tons/acre for Simon and Keller, respectively. Brix content ranged from 13.4 to 17.8 for M81-E and TOP 76-6, respectively. These data suggest that Keller and Dale are highly productive in stem yield while Keller and M81-E were most productive in syrup production. There were strong tendencies for higher yielding varieties to have low Brix content.

P. 40. Yield and plant population of whole sweet sorghum in eastern Kentucky

Crager *J.D. Foster, C. Timberlake, Drs. J. Michael Phillips and Rebecca Miculinich, Mentors, Department of Agricultural Sciences, College of Science and Technology

Sweet Sorghum is a drought-tolerant, C4 grass with a demonstrated high yield potential in Eastern Ky. A study was conducted in 2010 to determine whole plant yield, stalks per acre, and percent dry matter for whole and squeezed stalks of nine commercial sweet sorghum (*Sorghum bicolor* (L.) Moench) varieties. The varieties included Dale, Della, SugarDrip, Theis, M81-E, Keller, TOP 76-6, Umbrella, and Simon. Whole plant yield (wet weight) ranged from 8.73 to 38.33 tons/acre for Umbrella and Keller, respectively. The number of stalks per acre ranged from 23,958 to 121,097 stalks/acre for Umbrella and Keller, respectively. There is a 0.73 correlation value between the whole plant production and the number of stalks per acre. These data suggest that Keller and M81-E varieties are consistently high producing varieties. Plant population data suggest that some varieties were much higher in population than others because of variation in seed size.

P. 41. The effect of pyruvate dehydrogenase E1-alpha subunit on fresh pork quality

Crager *Ashton L. Wurzel, Drs. Rebecca Miculinich and Troy J. Wistuba, Mentors, Department of Agricultural Sciences, College of Science and Technology

Previous research has determined that meat quality traits can be improved through marker assisted selection in livestock populations. The objective of this project is to investigate the effect of a promising candidate gene, Pyruvate dehydrogenase E1-alpha subunit (*PDHAI*), on fresh pork quality. *PDHAI* has been found to catalyze the conversion of pyruvate into acetyl-CoA. A deficiency of the enzyme pyruvate dehydrogenase is one of the most commonly defined genetic defects of mitochondrial energy metabolism resulting in lactic acidosis. Genomic DNA was extracted from approximately 300 Berkshire and Landrace swine blood samples. Primers were designed using known porcine cDNA sequence. Polymerase chain reaction, restriction fragment length polymorphism (PCR-RFLP) procedures and a statistical association analysis to compare genotype effects on economically important carcass and meat quality traits is ongoing. Results of the *PDHAI* genotype differences for fresh pork quality, as well as, allele frequencies in each population will be reported. Funding for this project was provided by the MSU Undergraduate Research Fellowship, the MSU Center for Regional Engagement Grant and the Ohio State University Department of Animal Sciences.

P. 42. Animal Assisted Intervention (AAI) and its effects on education

Crager **Kayla Keeton, Dr. Kimberly Peterson, Mentor, Department of Agricultural Sciences, Veterinary Technology Program, College of Science and Technology*

Animal Assisted Intervention (AAI) have been studied extensively in the areas of psychological and physical therapies. The effect of the presence of animals on learning is not well documented. This study explores the learning outcomes of female adjudicated youth in the presence of Greyhound dogs. Retrospective Language Arts test scores are evaluated in the study group prior to and during the dog handling experience. The control group in the same facility has not participated in dog handling activities. The two groups are analyzed to compare the differences in learning outcomes between youth that handle Greyhound dogs and youth that have no dog interaction. Evidence suggests reading scores improve in the presence of the dogs.

P. 43. Scalable solid state thermoelectric coolant system for consumer electronics

Crager **Darin Vaughan, Dr. Sadeta Krijestorac, Mentor, Department of Applied Engineering and Technology, College of Science and Technology*

Originally designed for video gaming consoles and platforms, this system is designed to operate according to the heat output of a specific electronic device and requires no human control, as it is turned on similar to home heating and cooling devices using a thermostat type device. It contains zero moving parts and so is completely solid state, requires no maintenance and is very cheap to produce. Designed originally for the Xbox platform, the device seeks to resolve the 25% failure rate due to heat, and is intended to be sold to Microsoft, which will save cost in returns and warranties.

P. 44. Diversity and habitat preference in larval dragonflies inhabiting restored wetlands in eastern Kentucky

Crager **Tiffany Webb, Dr. Stephanie M. Welter, Mentor, Department of Biology and Chemistry, College of Science and Technology*

The health of restored wetlands can be assessed using dragonflies as indicator species because they may be dependent on specific microhabitats for survival. In the laboratory, we tested whether dragonfly larvae had microhabitat (bare sand, horizontal stick, vertical stick, or leaf) preferences over a 48-hour period, and whether species identity and larval stadium size influenced their choices. Some individuals exhibited microhabitat preferences, while others did not. Species identity might influence those microhabitat choices, but larval stadium does not seem to be a factor. More data are needed to further clarify these relationships, but dragonfly presence in restored wetlands might be affected by availability of larval microhabitats. This research was supported by an MSU Undergraduate Research Fellowship and a Kentucky Natural History Society grant.

P. 45. Antibiotic resistance genes in the Triplett Creek Watershed

Crager **Marisa Kamelgarn, *Julie Arnold, Dr. Geoffrey W. Gearner, Mentor, Department of Biology and Chemistry, College of Science and Technology*

Of 82 isolates of the bacterium *Escherichia coli* collected from selected sampling sites in the Triplett Creek Watershed assessed for antibiotic sensitivity using the Kirby-Bauer method, 100% were resistant to clindamycin, 92.7% were resistant to erythromycin, 41.5% were resistant to streptomycin, none were resistant to sulfamethoxazole+trimethoprim, and 18.3% were resistant to tetracycline. Isolates that exhibited resistance to tetracycline were assessed for the antibiotic resistance genes (ARGs) *TetO* and *TetW* utilizing polymerase chain reaction. Three of 15 isolates tested were positive for the *TetO* gene, while two tested positive for the *TetW* gene. Isolates that exhibited resistance to erythromycin were assessed for the ARGs *ereA* and *mrsA/B*. Twenty of 76 isolates tested were positive for the *ereA* gene, while four were positive for the *mrsA/B* gene. The presence of ARGs in the local watershed will allow us to utilize ARGs as potential genetic markers of bacterial contamination.

P. 46. Synthesis of manganese-pentacarbonyl-bromide cyclopentadienyl derivatives using thallium precursors

Crager *Cameron Felty, Dr. Mark Blankenbuehler, Mentor, Department of Biology and Chemistry, College of Science and Technology

The cyclopentadienyl thallium derivatives 1,2-di-(3-methyl-benzoyl)-cyclopentadienyl thallium and 1,2-di-(2-methyl-benzoyl)-cyclopentadienyl thallium can undergo a substitution reaction where thallium is replaced with manganese-tricarbonyl-bromide. Thallium precursors are well known effective transfer reagents. The development of new transition metal organometallics is important in the study of new catalysts for organic transformations and also potential molecular wire applications. The synthesis of new organics and organometallic compounds of manganese will be presented.

P. 47. UmuD expression in DNA damaged and undamaged *Acinetobacter* and *Escherichia coli* cells

Crager *Sara Wheeler, *Kasandra Lambert, Gavin Howington, Sabal Adhikari, Dr. Janelle Hare, Mentor, Department of Biology and Chemistry, College of Science and Technology

DNA is vulnerable to mutation through many elements, such as chemicals (mitomycin C) and ultraviolet radiation, so to protect genomes, organisms produce proteins such as UmuD and UmuC to replicate damaged DNA. Using the technique of Western blotting, UmuD expression from native and constitutive promoters can be qualitatively and quantitatively determined. Our anti-UmuD peptide antibodies show UmuD expression in *E. coli* cells and from both promoters, and that cleavage of UmuD occurs after both mitomycin C and UV exposure. UmuD proteins with histidine tags on the N terminus were constructed to facilitate the isolation and purification of UmuD. Expression of full length, but not N-terminally truncated forms of UmuD were observed in *E. coli* cells. This research is supported by NIH 1R15GM085722-01.

P. 48. Development of an elemental leaching methodology for coal ash leachate analyses

Crager *April Ward, *Jacob Miller¹, *Elizabeth Ann Harris¹, Travis Cantrell¹, B. Lauren Gray¹, Ryne Carroll¹, and Miranda Noel¹, Drs. Zexia K. Barnes¹, Nathan L. Coker¹, Ann M. Macintosh¹ and Jennifer M.K. O'Keefe², Mentors, ¹Department of Biology and Chemistry, ²Department of Earth and Space Sciences, College of Science and Technology

To assess how elements leach from coal combustion by-products (CCBs) produced by stoker boilers and begin to quantify the possible risks from CCB use or disposal, CCBs and feed coal were sampled from two stoker boilers before and after the ash handling system was modernized. Over the course of a three-year period, culminating in the Fall 2010 semester, a single total leachability method for coal ash was developed. The development process ranged from involved batch leaching techniques through a variety of total leachability techniques. The final technique, leaching in 2% nitric acid for 16-hours was chosen because the time frame matches the time used in batch leaching techniques and the nitric acid treatment most closely matched the maximum possible acidity of area groundwater. This work was funded by an USGS NCRDS grant.

P. 49. Elemental analyses and morphology of coal combustion by-products produced post-retrofit by the Morehead State stoker boilers

Crager *Christine DuChane¹, *Kassandra Lambert¹, Drs. Ann M. Macintosh¹ and Jennifer M.K. O'Keefe², Mentors, ¹Department of Biology and Chemistry, ²Department of Earth and Space Sciences, College of Science and Technology

To assess how elements occur within and leach from coal combustion by-products (CCBs) produced by stoker boilers and begin to quantify the possible risks from CCB use or disposal, CCBs and feed coal were sampled from two stoker boilers before and after the ash handling system was modernized. Samples post-retrofit were made into polished pellets for SEM-EDS analyses. Images were captured and analyzed for ash morphology. These morphologies were compared to shapes observed in reflected light petrography. Elements contained in both the bulk ash and leached samples were analyzed and compared. This work was funded by an USGS NCRDS grant.

P. 50. Trends in elemental leaching from coal combustion by-products from two stoker boilers before and after modernization of the ash handling system

Crager *April Ward¹, Jacob Miller¹, Elizabeth Ann Harris¹, *Travis Cantrell¹, B. Lauren Gray¹, Ryne Carroll¹, and Miranda Noel¹, Drs. Zexia K. Barnes¹, Nathan L. Coker¹, Ann M. Macintosh¹ and Jennifer M.K. O'Keefe², Mentors, ¹Department of Biology and Chemistry, ²Department of Earth and Space Sciences, College of Science and Technology

To assess how elements occur within and leach from coal combustion by-products (CCBs) produced by stoker boilers and begin to quantify the possible risks from CCB use or disposal, CCBs and feed coal were sampled from two stoker boilers before and after the ash handling system was modernized. Both boilers operate below their efficiency window and utilize the same feed coal. Prior to retrofit, emission controls on the systems consisted of multicyclone dust collectors, as well as a single baghouse. Following modernization, the boilers are operating somewhat closer to peak efficiency and have additional pollution controls, namely three diatomaceous-earth lined baghouses that together remove virtually all particulate matter from the combustion gas stream. CCB's were sampled from multiple points within the systems, including bottom ash, sidestream ash, multicyclone ash, and, where present, baghouse ash. Samples of each ash were shaken for 16-hours in 2% nitric acid to find total leachability. This method was chosen over other methodologies due to the acidity of the local groundwater and lack of results in pilot studies using batch leaching and groundwater leaching techniques. Preliminary results indicate that in terms of ash stability, ashes produced prior to the retrofit have greater total leachability than ashes produced after the retrofit. This work was funded by an USGS NCRDS grant.

P. 51. Regulation of SOS mutagenesis via the self-cleavage and expression of UmuDAb

Crager *James Bradley, *Jodi Wilder, Dr. Janelle Hare, Mentor, Department of Biology and Chemistry, College of Science and Technology

Organisms have developed different response systems to survive DNA damage such as the SOS response which results in the expression of the proteins UmuD and UmuC. After DNA damage, UmuD undergoes self-cleavage and binds with UmuC to form polymerase V which performs translesion synthesis. We are investigating the regulation of the expression of UmuDAb by its putative promoter region. Previous results show that an *Escherichia coli* UmuD mutant fails to express UmuDAb from its native promoter. Lack of observed cleavage of UmuD in ADP1 may be due to a single amino acid mutation in UmuDAb that, in *E. coli* result in a non-cleavable UmuD. We are mutating *umuDAb* to mimic the *E. coli umuD* to see if this restores the ability of UmuDAb to self-cleave. This work was funded by grant 1R15GM085722-01.

P. 52. The longitudinal study of cortisol levels in stressed rats

Crager *Elizabeth S. Moore, Drs. Mark Blankenbuehler and Ilsun White, Mentors, Department of Biology and Chemistry and Department of Psychology, College of Science and Technology

Rats were subjected to stress via needle injection. One rat underwent a cortisol injection, and the other saline. To determine blood cortisol level, samples were taken at different times after cortisol injection. Behavioral effects of cortisol were also measured in a separate group of animals. Using an ELISA kit, the samples were analyzed for cortisol levels, and correlated with behavior noted in the rats during the extraction. This study was conducted as part of an Undergraduate Research Fellowship with Dr. Ilsun White.

P. 53. Development of the RAMPART communications systems

Crager *Nathan Fite, Dr. Benjamin Malphrus, Jeff Kruth, Kevin Brown, Bob Twiggs, Mentors, Department of Earth and Space Science, College of Science and Technology

The Rapid prototyped Microelectromechanical system and Propulsion and Radiation Test (RAMPART) project is a rapid-prototyped (3-D printed) 2U cubesat that has evolved into a risk reduction mission for the Polar Orbiting Passive Atmospheric Calibration Spheres (POPACS) mission. RAMPART features a MEMS propulsion system, an experimental high-efficiency solar cell, and a deployable solar array. The RAMPART design team is a diverse group, but for the purposes of this presentation, the focus will be on the communications systems development by students and faculty of the Space Science Center at Morehead State University. Work discussed includes: implementation and testing of a VHF and a UHF dipole antenna with transmission lines, a 2.4GHz S-Band patch antenna, the spacecraft radios, and the corresponding ground stations.

P. 54. Gliolab: Development of a platform for ISS cubelab--based biomedical missions

Crager *Cara E. DeMoss, *William L. Grey, Drs. Darrin L. DeMoss and Benjamin K. Malphrus, Mentors, Department of Biology and Chemistry and Department of Earth and Space Sciences, College of Science and Technology

Gliolab is a joint project between Morehead State University, GAUSS-Group of Astrodynamics at the "Sapienza" University of Roma, Kentucky Space and the NASA Ames Research Center that involves the development of a 2U CubeLab (Gliolab) that will enable researchers to perform biomedical experiments in microgravity. The primary objectives of the project are to develop a CubeLab platform for performing simple biological experiments on the International Space Station (ISS), and to perform a case study experiment that will drive the development of the CubeLab. The mission profile will involve ground based and microgravity research utilizing the Glioblastoma cancer cell-line, the most common and aggressive type of primary brain cancer. Flights for the Gliolab system on ISS and the current Endeavor shuttle mission (STS-134) have already been secured by Kentucky Space. The capability of CubeLabs for biomedical research onboard ISS could help pave the way for future affordable biomedical experiments in microgravity and yield new in-orbit and terrestrial biomedical applications and treatments.

P. 55. An archival study of the x-ray spectra of blazars with the Chandra X-ray Observatory

Crager *Benjamin Cahall, Dr. Thomas Pannuti, Mentor, Department of Earth and Space Sciences, College of Science and Technology

This poster presents an analysis of the X-ray spectra of a sample of blazars that are candidates for long-term radio monitoring observations with the 21-meter Space Tracking Antenna at Morehead State University. These spectra were extracted from data obtained by pointed observations made with the *Chandra* X-ray Observatory and were fit with several different models, including a simple power law model and a thermal plasma model. The main goal of this work is to identify spectral variations in the X-ray spectra of blazars and determine if these variations correlate with other properties of the blazars. To illustrate this work, we present an analysis of two blazars, 3C 345 and 1ES 2344+514. Initial results will be presented and discussed.

P. 56. Earth odyssey moonbeam

Crager **Hyoun-Sup Lim, Robert Twiggs, Mentor, Department of Earth and Space Sciences, College of Science and Technology*

MoonBeam is another version of CricketSat. CricketSat is a small satellite that uses 9V battery invented by Robert Twiggs. Difference between CricketSat and MoonBeam is battery source. MoonBeam uses ultracapacitor instead of a battery. Ultracapacitor is new capacitor that has high capacitance such as up to 0.5F (normal capacitors have $\mu\text{or nF}$). By using ultracapacitor, MoonBeam can be constructed in much smaller size than CricketSat. MoonBeam will be constructed by June or July 2011 and will be flown in 2012. CubeSat will hold more than 20 MoonBeams when it's completed and will be launched in the International Space Station. This research is supported by an MSU Undergraduate Research Fellowship.

P. 57. Program content evaluation for elementary and middle grades pre-service teachers: Light and heat

Crager **Jacob Burns, Dr. Elizabeth Roland, Mentor, Department of Earth and Space Sciences, College of Science and Technology*

This study is a comparison of two treatments for 226 preservice elementary and middle grades teachers on the concepts of light and heat. The participants enrolled in a physical science course as part of their preservice teacher education program. One treatment is a traditional physics course and the second is an inquiry physical science course designed for preservice teachers. The multiple-choice test was administered as a post-instructional test in a science methods course. A test-retest design was utilized. The results suggest students tend to retain knowledge over time. Both courses require revision for students to obtain desired course outcomes. Project supported by the UG Fellowship and National Science Foundation-MSP Start.

P. 58. Petrography and bulk chemistry of coal combustion by-products from stoker boilers: A comparative study before and after modification of an ash handling system

Crager **Adam R. Layne, Dr. Jennifer M.K. O'Keefe, Mentor, Department of Earth and Space Sciences, College of Science and Technology*

Feed coal and coal combustion by-products (CCBs) were sampled from two stoker boilers before and after the ash handling system was modernized. The feed coal has not changed significantly in the five years between sampling events, providing a unique opportunity to examine the changing optical and chemical character of the ash in relation to system modification. Both boilers operate below their peak efficiency window and utilize the same feed coal. Prior to retrofit, emission controls on the systems consisted of multicyclone dust collectors, as well as a single baghouse. Following modernization, the boilers are operating somewhat closer to peak efficiency and have additional pollution controls, namely three diatomaceous-earth lined baghouses that together remove virtually all particulate matter from the combustion gas stream. CCB's were sampled from multiple points, including bottom ash, sidestream ash, multicyclone ash, and, where present, baghouse ash. Bulk chemistry and optical petrography were completed on samples acquired following modernization and compared to pre-existing data. Changes are seen in ash size distributions and carbon contents, especially in the multicyclone and baghouse ashes, where fine carbons are prevalent. This work was funded by an USGS NCRDS grant.

P. 59. Using theory to understand dietary supplement perceptions among health, wellness and human performance students

Crager **Laura Stacy, Drs. Gina Blunt and Jennifer Dearden, Mentors, Department of Health, Wellness and Human Performance, College of Science and Technology*

Recently, there has been much interest in understanding dietary supplement use. The consumption of dietary supplements has risen significantly while perceptions of use are poorly understood. Using theory is a common way to understand health behavior. In a previous study of 100 college students, 68% responded “yes” when asked if they currently or have ever taken a dietary supplement. While the majority felt that medical doctors (96%) and registered dietitians (85%) were the most qualified to provide information about dietary supplements, 44% stated they received advice from friends. The purpose of this study was to utilize behavioral theory (Social Cognitive and Theory of Planned Behavior) to understand perceptions of use of dietary supplements among a college-aged population. This research supported by an Undergraduate Research Fellowship.

P. 60. The use of podcasts to enhance student understanding of wellness concepts

Crager **Tiffany Murray, *Kristen McMahan, *Stephanie Powers, *Kayla Hall, Drs. Monica Magner and Gina Blunt, Mentors, Department of Health, Wellness and Human Performance, College of Science and Technology*

Middle school students were targeted for a physical activity and nutrition intervention in Martin County, Kentucky. Students were afforded increased opportunities for physical activity and classroom teachers utilized integrated lessons to reinforce health and wellness concepts. Podcasts were created in the targeted areas utilizing research from the type of student population, health literacy/awareness, and interest areas of the students. The resulting podcasts were loaded onto the Martin County on the Move website for easy access for teachers and staff. The podcasts include video, a fact sheet for teachers, and a student self-assessment of podcast content.

P. 61. RFID and Ethernet enabled access control systems

Crager **Anthony Fitch, Drs. R. Duane Skaggs and Doug Chatham, Mentors, Department of Mathematics, Computer Science and Physics, College of Science and Technology*

The purpose of this project is to create a Radio Frequency Identification (RFID) based access entry system. This system is Ethernet/Internet enabled to serve as a second factor of authentication and as a method of administering the system. The constraints for this project are to install this system on a door but the installer is not able to modify the door in any way so the unlocking mechanism has to be generic. This is built using the Arduino microcontroller platform using various off-the-shelf components. This project is CS 499C Computer Science Capstone.

P. 62. Electrical properties of CdTe photovoltaic cells

Crager **Trenton Peterman, Dr. Kent Price, Mentor, Department of Math, Computer Science and Physics, College of Science and Technology*

Thin-film photovoltaics (PV) modules that create electricity from sunlight energy are playing an increasingly important role in alternative energy production, and are more cost-effective than the traditional silicon based solar cells. This initiative concentrates on the research and application of Cadmium Telluride (CdTe) PV cells, which are currently leading the market in thin-film PV cell production. By examining the effects of illumination on the solar cell, I obtained various measurements related to the voltage and current created by the solar cell, as well as a measurement of the cell’s efficiency. The primary focus of my research is calculating the voltage decay properties of the solar cell, which can be used to better understand the processes that are taking place within the cell.

P. 63. Utilizing hodge theory to rank base stations in the 4G mobile network

Crager

***Joshua G. Bradley, Dr. Sherif Rashad, Mentor, Department of Math, Computer Science and Physics, College of Science and Technology**

In this presentation, we present a novel base station ranking technique currently under development that will support the network management of the new generation of mobile networks, in an effort to enhance the mobility experience for each mobile user. This technique involves the application of Hodge theory to fixed nodes (considered to represent a base station in the mobile network) in the mobile network in order to obtain a global ranking of base stations based upon the traffic flow between the base stations. Hodge theory provides a way to obtain this global ranking of edge flows from sparse graphs by decomposing pairwise rankings into two orthogonal components, a gradient flow and a divergence free flow, which acts as a measure of “confidence” on the global ranking of the edge flow. It also relates information as to why a global ranking of an edge might be unobtainable. This technique will incorporate factors such as network traffic flow, cluster density, and link-structure based link prediction results. Funding for this research was provided by an MSU Undergraduate Research Fellowship.

P. 64. Design and implementation of a blackberry friend tracking app

Crager

***Brad Schneider, *Joshua G. Bradley, Dr. Sherif Rashad, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology**

In this presentation, we present a blackberry friend tracking application that was developed as a class project in CS 380 - Software Engineering. The design is based on a GPS tracking system. This application allows mobile users to locate their friends on a map anywhere on the globe in real time via a graphical map display, which can also be modified to the users’ preference. To preserve the privacy of each contact, our application also provides the option for a user to appear “visible” or “invisible” to his friends at any time. A software engineering cycle of design, development and testing will be presented. Possible future developments include multiple status options and a “block list” to increase the privacy of each mobile user.

P. 65. The $n + k$ Queens domination separation problem

Crager

***M. Blake Nickell, Drs. Robin Blankenship, Doug Chatham, and R. Duane Skaggs, Mentors, Department of Mathematics, Computer Science, and Physics, College of Science and Technology**

The Queens domination number for an $n \times n$ chessboard is the smallest number of Queens required to either occupy or attack all squares of the board. For a standard 8×8 chessboard, this can be accomplished with a minimum of five Queens. We consider the effect of placing k Pawns, which block certain attacks, on the Queens domination number. This research was supported by an Undergraduate Research Fellowship.

P. 66. The $n + k$ Queens separation problem

Crager

***William M. Holbrook II, Drs. Robin Blankenship, Doug Chatham, and R. Duane Skaggs, Mentors, Department of Mathematics, Computer Science and Physics, College of Science and Technology**

A well-known problem asks for the maximum number of Queens that can be placed on an $n \times n$ chessboard such that no two Queens attack each other. For $n > 3$, it is always possible to place n Queens, but no more than n , in this manner. However, it is possible to add more Queens if we add Pawns to block some attacks. Work by the mentors and previous Undergraduate Fellows has shown that we can add up to k extra Queens if $n > \max\{k + 87, 25k\}$. We are interested in lowering this bound on n . This research was supported by an Undergraduate Research Fellowship.

P. 67. Hex-stick mosaics of (p,p+1)-torus knots

Crager *Zachary Wagner, Jessica Smith, Dr. Robin Blankenship, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology

Hextile knot mosaics are converted to hex-stick mosaics by straightening the strands of rope that lay on each hextile. Hex-stick mosaics of (p, p+1)-torus knots were constructed to investigate a lower bound on the number of sticks a particular torus knot would require when embedded in a hex-stick mosaic. The first objective is to use the bridge number of the torus knot to determine a lower bound on its hex-stick number for $p \geq 2$, and the second objective is to use the hex-stick number to obtain a lower bound on the size of hextile knot mosaic needed to embed a (p,p+1)-torus knot for $p \geq 2$.

P. 68. Significant digits and tile occurrence in hextile knot mosaics

Crager *Michael Blankenship, Drew J. Pearson, Dr. Robin Blankenship, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology

There are 230 combinations of radius one hextile knot mosaics possible when using the 27 different hextiles. The number of hextile knot mosaics for radius two skyrockets to over 63 trillion. It turns out both of these numbers contain factors of three and four prime numbers, respectively. The objectives will be: (1) finding the number of mosaic combinations for hextile mosaics of radius larger than two through C# computer programming, (2) whether the pattern of prime factors continues with the third and fourth radii, and (3) the amount of times each of the 27 tiles are used during each combination calculation.

P. 69. Comparison of a clinical study site health assessment versus recommendations for advanced nursing health assessment

Crager *Heather Knipp, Christa Bledsoe, Mentor, Department of Nursing, College of Science and Technology

The use of an advanced health assessment is a pertinent component to the medical care of patients suffering from a variety of disorders. Comparison of the physical assessment at a clinical study site to an advanced health assessment was completed to identify deficiencies and attributes. Findings concluded that the pulmonary assessment at the clinical study site used vague and minimum assessment data that was not sufficient to evaluation measures needed to improve patient care. After research of peer reviewed articles and information taken from an Advanced Health Assessment course, recommendations for improvement of the pulmonary assessment include use of symmetric expansion and diaphragmatic excursion, tactile fremitus, percussion, and voice sounds. Also, a more extensive respiration and breath sounds assessment is recommended.

P. 70. An assessment of clinical sites' adherence to HCAHPS guidelines for patient's adequate pain control

Crager *Steven Campton, *Jessica Glinski, *Angela Hall, *Kylene Johnson, *Chelsea Lloyd, Michelle McClave, Mentor, Department of Nursing, College of Science and Technology

Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is a standardized survey used nationally to allow patients to rank their satisfaction with care received. The purpose of HCAHPS is to provide hospitals with the means to enhance patient outcomes and improve overall quality of care. The purpose of this study is to assess three clinical study sites' recognition and management of patient's pain. Pain measurement control is a nursing centered intervention that is an essential aspect of patient care. Evidence based practice (EBP) will be utilized to support findings and recommendations.

P. 71. An overview of falls with injury: Assessment in clinical study sites

Crager ****Carl Bennett, *Heather Knipp, * Wanda Mora, *Chadwycke Smith, Michelle McClave, Mentor, Department of Nursing, College of Science and Technology***

This study will examine the prevalence, assessment methods and prevention interventions related to falls in three clinical study sites in the university's service region. Our study will compare the current mechanisms to determine the best evidence-based practices in regards to the Joint Commission's requirement for fall-related injury prevention. This will include risk assessment processes, means of identifying those considered "at risk" for falls, and other procedures utilized to prevent fall-related injury in the inpatient population.

P. 72. Comparison of smoking cessation strategies for clinical study site improvement

Crager ****Jennifer Bellamy, *Jacob Durham, *Alexandria Fisher, *Jeremy Gayheart, *Courtney Woods, Michelle McClave, Mentor, Department of Nursing, College of Science and Technology***

The purpose of this study is to assess evidence based nursing-centered mechanisms for smoking cessation. This is done by comparing the strategies implemented by three clinical study sites to the National Quality Forum (NQF) endorsed intervention measures. An evaluation of how the clinical study sites are meeting NQF standards and recommendations for improvements will be discussed.

P. 73. Strategies for prevention of hospital-acquired pressure ulcers

Crager ****Hannah Adkins, *Deirdre Alleshouse, *Chelsey Roe, *Juliana Thornbury, *Florence White, Michelle McClave, Mentor, Department of Nursing, College of Science and Technology***

Pressure ulcers can occur in any population and can prolong the length of stay in the hospital. Many measures have been used to reduce their occurrence. The purpose of this research is to investigate strategies used to reduce the prevalence of pressure ulcers in the clinical setting through nursing-centered interventions. Through the National Database of Nursing Quality Indicators (NDNQI), we will compare and contrast three clinical study sites' mechanisms in addressing the prevention of pressure ulcers. By looking at Evidenced Based Practice (EBP), we will be able to recommend effective nursing-centered interventions to impede the prevalence of pressure ulcers acquired during the hospital stay.

P. 74. Comparison of nurse - client communication in clinical study sites

Crager ****Hillary Boesch, *Tiffany Fletcher, *Ariel Frederick, *Whitney Jamison, *Kyle Nauert, Michelle McClave, Mentor, Department of Nursing, College of Science and Technology***

The purpose of this research is to compare and contrast quality control measures utilized to evaluate effectiveness of nurse-client communication in three clinical study sites. In accordance with Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), methods used to evaluate patient satisfaction in regards to nurse communication with clients are used as quality improvement measures to reflect the patient's overall perspective of their healthcare experience. Seen as the most fundamental aspect of nursing, communication is needed to develop a firm nurse-client relationship that will later facilitate positive patient outcomes and satisfaction. Utilizing evidence based research concerning effective communication techniques; a critique of each clinical study site is performed to assess methods for evaluating patient satisfaction with nurse - client communication

P. 75. An overview of nursing-centered interventions that impact restraint prevalence among various clinical agencies.

Crager *Ellie Nichols, *Amanda Rudd, *Morgan Suttles, *Kylie Virgin, *Julia Bublitz, Michelle McClave, Mentor, Department of Nursing, College of Science and Technology

The National Quality Forum has identified the prevalence of restraint use as an impeding factor in the delivery of quality nursing care. To address this issue, this research will focus on the interventions outlined by various clinical agencies and how these interventions impact the prevalence of restraint use. This research also will examine evidenced-based practice to compare and contrast the effectiveness of the nursing-centered interventions set forth by the clinical agencies.

P. 76. Strategies for reduction of catheter-associated urinary tract infections as indicated by NDNQI

Crager *Tabbatha Loan, *Megan Neal, *Sarah Whisman, *Jessica Winters, Michelle McClave, Mentor, Department of Nursing, College of Science and Technology

The goal of this poster is to identify recommendations for nursing interventions to decrease the incidence of catheter-associated urinary tract infections. The National Database of Nursing Quality Indicators, paired with the National Quality Forum, has identified catheter-associated urinary tract infections as a nursing-centered intervention measure to be studied. By analyzing evidence-based research in addition to information gathered at three regional clinical sites, we will compare and contrast mechanisms for addressing catheter-associated urinary tract infections.

P. 77. Bulls-eye survey of value based living: Continuing validation

Crager *Dandan Li, David Book, Joe Hamil, Aaron Ellis, Dr. John T. Blackledge, Mentor, Department of Psychology, College of Science and Technology

The Bulls-Eye Value Survey (BEVS) is a self-report measure designed to assess psychotherapy client values, a construct of central importance to Acceptance & Commitment Therapy. The instrument appears to measure an independent dimension of psychological functioning that is negatively correlated with measures of depression, anxiety and stress and positively correlated with a measure of psychological flexibility when administered to a Swedish undergraduate sample. (T. Lundgren et al). In the present study, we examined the BEVS and related previously validated self-report instruments with a sample of undergraduate subjects. Subjects were given surveys and asked to repeat the surveys two-weeks later. Our findings support evidence furthering the findings that the BEVS subscales are a valid measure of values, value action discrepancies, and barriers to value based living.

P. 78. Effects of alcohol on perception of emotion among college students

Crager *Josh Stephens, Dr. Ilun M. White, Mentor, Department of Psychology, College of Science and Technology

The present study examined the acute and intermediate effects of alcohol on emotion perception. Participants in the study were student volunteers at Morehead State University. The accuracy of emotion discrimination was measured by DANVA2 task, which consisted of faces and voices of children and adults with different emotions. A breathalyzer measured blood alcohol concentration (BAC). During the acute state (BAC>0.01), subjects made more errors, compared to the controls, particularly in discriminating negative emotions. During the intermediate state (BAC=0; consumed alcohol 20-24 hrs. before testing), alcohol subjects showed difficulty in discriminating negative emotions with low intensity. Our data suggests that alcohol selectively impairs the ability to discriminate negative emotion, and such inability to discriminate emotion accurately will affect behavior in social situation.

P. 79. Memories for social and interracial interactions

Crager **Shayla Miller, Katie Klik, Dr. David Butz, Mentor, Department of Psychology, College of Science and Technology*

The current study examined how individuals' personality characteristics and social attitudes affect the number, quality, and clarity of memories for same-race and interracial interactions. We additionally examined differences in the characteristics of memories as a function of whether memories were for same-race or interracial interactions. Participants provided retrospective memories for up to five same-race interactions and five interracial interactions, rated these memories on a series of dimensions, and completed a questionnaire containing personality scales and measures of attitudes toward various social groups. Results will be discussed in terms of their implications for understanding the factors that relate to memories and differences in memories as a function of the type of interaction. This research was supported by an MSU Undergraduate Research Fellowship.

P. 80. Age effects on emotion recognition

Crager **Leslie Mallory, J. David Forman, Dr. Ilun M. White, Mentor, Department of Psychology, College of Science and Technology*

We examined the age effects on discrimination of emotional expression. The accuracy of discrimination was tested using DANVA2, which consists of four subsets with faces and voices of adults and children in four emotional categories: happy, sad, angry, or fearful. Participants were college students and senior volunteers in Morehead, Kentucky. Overall, elderly subjects made more errors across all conditions, and accuracy also depended on emotional category. Both groups made less errors on positive emotions, but elderly subjects made more errors on negative facial expressions. Similar patterns were shown in voice conditions. Our data suggests that our ability to discriminate emotion decreases with age and varies with the nature of stimuli (positive or negative). This research was supported by an MSU Undergraduate Research Fellowship.

P. 81. Is love blind? Partner expectations and relationship behavior

Crager **Sydney Howard, Dr. David A. Butz, Mentor, Department of Psychology, College of Science and Technology*

Idealizing romantic partners can have a number of positive implications for relationships, including increased satisfaction and decreased conflict (e.g., Murray, Holmes, & Griffin, 1996). However, ideals may compromise the quality of relationships when people perceive their partner as not living up to ideals. To examine this idea, 41 females rated their perceptions and ideals for relationship partners, satisfaction, and openness to alternative partners. Results indicated that the more females perceived male partners as discrepant from ideals, the less satisfied and committed they were to the relationship and the more open they were to alternative relationships. Results will be discussed in terms of their implications for understanding the factors that influence the quality of romantic relationships. This project was supported by an MSU Undergraduate Research Fellowship.

P. 82. Alcohol effects on social interaction in adolescent rats

Crager **Britney A. Maynard, Sarah Schoenhagen, Dr. Ilun M. White, Mentor, Department of Psychology, College of Science and Technology*

The present study examined alcohol effects on social interaction during later development using an animal model. Adolescent rats received multiple injections of alcohol and their social interaction was examined across a two-week period. Guided by our previous report (White et al., 2009), two observers rated social interaction (inter-rater reliability .92). Both groups increased contact and decreased rearing across two-weeks. However, alcohol group showed further increase in contact and less decrease in rearing, yielding higher scores in overall social interaction. Our data suggests that alcohol reduces expression of behavioral inhibition, likely due to decreased prefrontal inhibition. Future study will compare the effects of different classes of drugs on social interaction. This study was supported by an MSU Undergraduate Research Fellowship.

P. 83. Coping styles and depressive personality correlates of shame and guilt

Crager

***Samantha Brewer, Jacklyn Niece, Dr. David R. Olson, Mentor, Department of Psychology, College of Science and Technology**

Guilt and shame have been associated with various forms of distress, including depression. This project examined these emotions and their association with coping strategies and depressive personality characteristics. One hundred thirty women and men completed measures of shame- and guilt-proneness, coping strategies, and sociotropy and autonomy. Correlational analyses indicated that proneness to shame was negatively related to coping strategies involving positive reinterpretation, mental disengagement, focus on emotions, and planning. Shame was positively associated with coping tactics involving substance use and social support. Guilt was positively related to positive reinterpretation, focus on emotions, active coping, and inversely associated with suppression of competing activities. Sociotropy was found to be positively related to shame and negatively related to guilt. Autonomy was positively related to both shame and guilt.

P. 84. Impact of amphetamine and dopamine agonists on acute- and withdrawal-phase feeding in rats

Crager

***Alyssa D. Addison, Gianni Maione, Nicholas A. Holt, Dr. Wesley White, Mentor, Department of Psychology, College of Science and Technology**

Adult male rats were housed in individual tubs in an animal colony. The animals were in a 12-12 hour light-dark cycle and had free access to water. At light onset, different groups of subjects were administered 2.0 mg/kg amphetamine, a dopamine D1 receptor agonist, or a dopamine D2 receptor agonist. Food pellets were placed in feeding cups within each tub during hours 2, 5 and 6-24 post treatment, and food intake during each of these intervals was measured. Compared to saline control, amphetamine produced both a short-term (hours 1-3) and a long-term (hours 6-24) reduction in food intake. Agonists primarily impacted short-term intake. The procedure used may provide an economical way to assess the contribution of dopamine receptors to amphetamine-induced stimulant and withdrawal states. The project was supported by an Undergraduate Fellowship and by NIH grants DA015351 and RR016481.

P. 85. Implications for positive parenting: Parental sensitivity as a predictor of secure attachment in children

Crager

***K. Fugate, *K. Sizemore, P.J. Sexton, Dr. Shari Kidwell, Mentor, Department of Psychology, College of Science and Technology**

Children's attachment is determined largely by sensitive caregiving. This study explores how attachment is related to sensitivity in discussions of children's behavior. Thirty-five families participated when children were four years of age, completing the Strange Situation procedure (Ainsworth, Blehar, & Waters, 1978). Attachment was classified using Crittenden's (2004) preschooler coding system. Sensitivity was assessed two years later via the Reminiscing Task (Laible & Thompson 2000), which involved discussion of a time when the child was "good" and "bad." Parents of secure children displayed greater sensitivity during the task. These findings support the concept of sensitivity as a mechanism for understanding how attachment is "handed down" from parent to child. This work was supported by grants from RCPC and KY EPSCoR, and by an MSU Undergraduate Research Fellowship.

P. 86. Where is your mind? Selective attention during diversity-related discussions

Crager **Chassidy N. Ison, Dr. David A. Butz, Mentor, Department of Psychology, College of Science and Technology*

The current work examines whether individuals selectively attend to racial minority faces when discussing topics related to diversity. Participants were randomly assigned to deliver a brief speech on “diversity in the classroom” or “technology in the classroom.” After rehearsing the speech, participants completed a computer task to assess their attention to white and racial minority faces. Finally, participants delivered their speech on camera. We anticipated that participants would selectively attend to racial minority over white faces to a greater extent when discussing topics related to diversity compared to non-diversity related topics. Results will be discussed in terms of their implications for understanding the role of attention in shaping the dynamics of discussions about diversity. This research was supported by an MSU Undergraduate Research Fellowship.

P. 87. Attachment and emotion regulation are related

Crager **Chelsea Baker, *Shelby House, Dr. Shari Kidwell, Mentor, Department of Psychology, College of Science and Technology*

This study explores the parent-child attachment relationship and its association with children’s patterns of emotion regulation. Thirty-five families participated when children were four years of age, completing the Strange Situation procedure (Ainsworth, Blehar, & Waters, 1978). Attachment was classified using Crittenden’s (2004) preschooler coding system. Emotion regulation was measured during a delay task in which children had to wait five minutes for their prize (Silk, 2006). Coding was completed in 15-second intervals. Results suggested that secure children engaged in more passive waiting, but had less a sad affect than insecure children. Anger and sadness were associated with increased attention on the prize. These findings suggest that emotion regulation has implications for children’s well-being. This work was supported by grants from RCPC and KY EPSCoR.

P. 88. Attachment as a moderator of young women's responses to betrayal

Crager **Medina Jackson, Revathi Krishna, Drs. Shari Kidwell and Laurie Couch, Mentors, Department of Psychology, College of Science and Technology*

Attachment to one’s parents impact not only childhood events but also influences many adult experiences. Attachment style has been shown to be a predictor of one’s well-being, but how does attachment affect one’s response to romantic betrayal? This study looked at how the attachment styles of female undergraduate students was associated with how they responded to a betrayal by a romantic partner. Attachment style was assessed by an interview based on the Adult Attachment Interview (Main and Goldwyn, 1984), and in another interview participants were asked to relate details about the worst betrayal they had experienced. Preliminary results suggest that perceived attachment as an adult may be more closely associated with response to betrayal than attachment to one’s parents.

P. 89. The voices inside my head: Utilization of magnetic resonance imaging in the schizophrenic patient

Crager **Nicole Nugent, Cyndi Gibbs, Mentor, Department of Imaging Sciences, Computed Tomography/Magnetic Resonance Program, College of Science and Technology*

Within a given year, one in four American adults will suffer from a diagnosed mental illness. Schizophrenia is considered the most chronic and most disabling of these mental disorders. It is known that schizophrenia causes a disturbance in the psychological thought process. Recent developments in imaging of the brain have shown that schizophrenia often is present with anatomical and physiological changes as well. These changes can be identified through the utilization of magnetic resonance imaging (MRI). Research involving functional magnetic resonance (fMRI) is primarily used to compare the brain function of a schizophrenic patient to a normal, healthy brain. Studies have shown that while some portions of a diagnosed patient's brain is less active than a healthy brain, other sections of the brain are more active when compared to the healthy counterpart. Promising new research demonstrates that fMRI may be used in the future to aid in earlier diagnosis, which could result in earlier treatment and a better prognosis for individuals with schizophrenia. Perhaps in the future, these individuals can live what most of us perceive to be a normal and productive life.

P. 90. Coactivation of D1/D2 receptors is required for amphetamine-induced hypophagia

Crager **Gianni Maione, Drs. Wesley White and Ilsun M. White, Mentors, Department of Psychology, College of Science and Technology*

Pretreatment with D1 or D2 antagonist blocks the long-term hypophagia induced by amphetamine. We examined the time-course of D1/D2 receptor activation required for such hypophagia. Rats were individually housed in stations where they lever-pressed for food (for one-hour periods every three hours). The effects of amphetamine on hypophagia were compared with or without D1/D2 antagonist. D1 or D2 antagonist given 30 minutes after amphetamine blocked long-term hypophagia, whereas antagonists given five hours after amphetamine failed to do so. Our results suggest that long-term hypophagia requires D1 and D2 receptor activation within five hours of amphetamine administration. Our results may have important implications for prevention of symptoms of acute withdrawal from amphetamine. This study was supported by R15DA015351 and P20RR016481.

P. 91. Theoretical approaches used in smoking cessation programs and their efficacy in relation to quit rates

Crager **Nakia S. Cantrell, Dr. Ann Rathbun, Mentor, Department of Health, Wellness and Human Performance, College of Science and Technology*

According to the CDC, cigarette smoking is the leading cause of preventable death in the United States, accounting for approximately 443,000 deaths, or one of every five deaths, in the United States each year. More than 80% of adult smokers begin smoking before 18 years of age. Youth quit attempts are rarely planned, and are typically unassisted and unsuccessful; as an assisted method, tobacco cessation programs have been shown to almost double the likelihood that a young smoker will succeed in quitting. This poster intends to investigate the theories used in smoking cessation programs and their efficacy in relation to quit rates.

P. 92. Intrusion detection in mobile wireless networks using data mining techniques

Crager **Ethan Plymale, Dr. Sherif Rashad, Mentor, Department of Mathematics, Computer Science and Physics, College of Science and Technology*

As wireless mobile networks become more prominent in our society, security for these networks is a growing issue. Because of the lack of a physical infrastructure, these networks are much easier to infiltrate and many old security solutions no longer work. The problem of intrusion detection becomes more difficult in integrated mobile networks, where different structures of mobile networks are integrated to provide better quality of service every time and everywhere. The goal of our research is to design and implement intrusion detection techniques for mobile networks using data mining technology.

P. 93. A survey of the psychological services available for police officers

Crager **Alexander M. Davis, Dr. Elizabeth P. Biebel, Mentor, Department of Sociology, Social Work and Criminology, Caudill College of Arts, Humanities and Social Sciences*

A survey will be conducted assessing the availability of psychological services for police officers. The survey will also include services for civilian workers and families of officers. It will be sent out to the top 50 largest city and county departments, as well as the 49 state police agencies (Hawaii does not have one) and the top five largest federal law enforcement agencies. We will find out which services are and are not being utilized and why or why not. The results of this survey will be published in a scholarly journal and will be used to improve psychological services in the various departments surveyed as well as others. This project is supported by an MSU Undergraduate Research Fellowship.

P. 94 The pressures of masculinity and doing crime

Crager **Hannah Willis, Rebecca S. Katz, Mentor, Department of Sociology, Social Work and Criminology, Caudill College of Arts, Humanities and Social Sciences*

Traditional definitions of the successful performance of masculinity include economic and career success and positive leadership roles such as father and husband providing a sense of dignity and self-respect to each man (Websdale, 2010). Recent qualitative research links the failure to achieve such an identity among men to both criminal behaviors (Messerschmidt, 2004). This previous work has led us to develop a quantitative scale designed to measure masculine identity and its causal links to men's crime. We are building a unique integrated gendered theory of crime by utilizing James Messerschmidt's structured action theory, Neil Websdale's work on familicidal behavior, Michael Kimmel's research on masculinities, psychological theories on empathy development, and critical race theory to explain the gendered theory of crime (Miller, 2008).

This research was supported by a MSU Undergraduate Research Fellowship. Preliminary findings will be presented at the American Society of Criminology Program meeting in November 2011.

P. 95 Ring closures of hydroxyl fulvenes using hydrazines

Crager **Tyler Franklin, Dr. Mark Blankenbuehler, Mentor, Department of Biology and Chemistry, College of Science and Technology*

Over the past years there have been studies on three iso-forms of Cyclo-oxygenase (COX), COX-1, COX-2, and COX-3. The COX enzyme plays a key role in inflammation. Many compounds have been synthesized to inhibit the Cyclo-oxygenases but there have also been undesirable side effects associated with these compounds. Gastrointestinal ulcers and cardiovascular problems are common. To minimize these side effects, additional studies of new compounds is needed. This study attempts to synthesize analogs of Celebrex[®] (a well known coxib inhibitor). The central pyrazole ring is replaced with a cyclopenta[d]-pyridazine. Nuclear Magnetic Resonance (HNMR) and Infrared Spectroscopy (IR) are used to characterize the products. This research was supported by the MSU Department of Biology and Chemistry.

2010-11

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