WKU A Leading American University with International Reach

40th Annual

Western Kentucky University

Student Research Conference

Saturday, February 27, 2010

Carroll Knicely Conference Center

Bowling Green, Kentucky

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Western Kentucky University
is an institutional member of the
Council on Undergraduate Research
Learning Through Research

SCHEDULE OF EVENTS

7:30-8:00 am	Student Registration Conference Center Lobby *Breakfast Refreshments Provided*
8:00-8:45 am	Welcome and Plenary Session Room 163B *Remarks by Dr. Gary Ransdell, University President, and Dr. Barbara Burch, Provost and Vice President for Academic Affairs*
9:00-10:30 am	Concurrent Paper Session Number 1 Rooms 112, 113, 118, 138, 163A, 163B, 163C
10:45 am-12:15 pm	Concurrent Paper Session Number 2 Rooms 112, 113, 138, 163A, 163B, 163C
11:00 am-1:00 pm	Undergraduate/Graduate Poster Session Room 130 *Poster Set-Up 10:30-11:00 am, Poster Judging 11:00 am-12:00 pm, Poster Open Viewing 12:00-1:00 pm* *Lunch Refreshments Provided 12:00-1:00 pm*
1:15-2:45 pm	Concurrent Paper Session Number 3 Rooms 112, 113, 118, 138, 163A, 163B, 163C

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BANQUET AND AWARDS CEREMONY

The WKU Student Research Conference Banquet and Awards Ceremony is scheduled from 5:00-7:30 pm CST on Monday, March 1, 2010 in the Ballroom of Garrett Conference Center on main campus. All students who presented papers and posters at the 40th Annual WKU Student Research Conference, as well as college deans and department heads, are invited to attend.

The Sigma Xi Lecture will begin at 5:15 pm. The dinner buffet will follow the presentation at about 6:00 pm. Conference award winners will be recognized following dinner.

Students received an email message with information about how to RSVP for the WKU Student Research Conference Banquet and Awards Ceremony. RSVPs were due by February 24.

The Sigma Xi Lecturer is Dr. Emily A. Tobey, Professor and Nelle C. Johnston Chair in Early Childhood Communication Disorders at the University of Texas at Dallas. Dr. Tobey will discuss "Frankenstein: How Physics, Literature and Theatre Led to a Scientific Success." The abstract for Dr. Tobey's presentation is as follows.

> It is hard to imagine how a simple observation made by Volta in the late 1700's could leave a lasting legacy impacting physics, literature and theatre. Yet such an observation was made and a legacy was formed that impacts the arts and sciences in ways Volta could not conceive. It is even safer to assume that Volta had no idea that his basic reflection would lead to the restoration of multiple aspects of hearing for many deaf people around the world nearly 300 years later. Imagine a world of silence, imagine a world warning against the over reaching of man and the industrial revolution, and finally, imagine that for the first time you are hearing your child speak, listening to a horse chomp oats or hearing the fall leaves rustle in the wind. Imagine, if you will, a world no longer silent.

ACKNOWLEDGMENTS

Funding for the 40th Annual WKU Student Research Conference was provided by the Office of the Provost and Vice President for Academic Affairs and by the WKU Chapter of Sigma Xi. The conference is organized by the WKU Student Research Council.

The WKU Student Research Council recognizes Dr. Barbara Burch, Provost and Vice President for Academic Affairs, for her long-standing dedication and commitment to student scholarship at Western Kentucky University.

WKU faculty/staff serving as conference judges are Cathy Abell, Darlene Applegate, Ferhan Atici, Nancy Baird, Alexander Barzilov, Mark Berry, Lauren Bland, Kristi Branham, Barbara Brindle, Ingrid Cartwright, James Chappell, Walter Collett, Mary Curtis, Trish Desrosiers, Devona Dixon, Mark Doggett, Holli Drummond, Lisa Duffin, Julie Ellis, Chris Ervin, Tim Evans, Xingang Fan, Jim Fulkerson, Alison Ganze, Marilyn Gardner, Linda Gonzales, Lance

Hahn, Tony Harkins, Cynthia Houston, Roy Howsen, Sandra Hughes, Kumi Ishii, Trish Jaggers, Audra Jennings, Guy Jordan, Molly Kerby, Rodney King, Edward Kintzel, Kenneth Kuehn, Michelle Lane, Qi Li, Ingrid Lilly, Danielle Lovell, Christine Nagy, Matthew Nee, Ivan Novikov, Jane Olmsted, Sarah Ostrowski, Zhao Qin, Rajalingam Dakshinamurthy, Claire Rinehart, Michael Seidler, Julie Shadoan, Nilesh Sharma, Fred Siewers, Roxanne Spencer, Derick Strode, Sharon Whitlock, Phillip Womble, Bangbo Yan, and Wan-Ju Yen. We greatly appreciate the support of the faculty/staff judges.

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

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

Members of the Student Research Council are Darlene Applegate, Amanda Beers, Richard Bowker, Steven Haggbloom, Audra Jennings, Molly Kerby, Bruce Kessler, Rodney King (Chair), Christine Nagy, Farley Norman, Carnetta Skipworth, Michael Smith, Lawrence Snyder, and Derick Strode.

Please visit www.wku.edu/studentresearch for more information about student research at Western Kentucky University.

CONCURRENT PAPER SESSION 1
9:00-10:30 am

Room 112 Undergraduate Presentations: Physical Sciences

9:00 am **Smelser, Amanda Marlene and Yan, Bangbo** "A New Hybrid Organic–Inorganic Porphyrin–Polyoxometalate Compound" (Dr. Bangbo Yan)

9:15 am **Sowell, Dewayne Emmanual** "Cost Effective Robotic Solutions for Military and Law Enforcement" (Drs. Phillip Womble and Alexander Barzilov)

9:30 am **Oakes, Landon* and Dobrokhotov, Vladimir** "Nanostructures in Electronic Nose Technology" (Drs. Vladimir Dobrokhotov and Alexander Barzilov)

9:45 am **Cook, Kyle Wayne** "Recent Results of the WKU Blazar Monitoring Project with Cross Correlations from the Fermi Gamma Ray Space Telescope" (Dr. Michael T. Carini)

10:00 am **Downen, Matthew Ross*** "Geochemical History of the Casitas Shield" (Dr. Andrew Wulff)

10:15 am **Flynn, Elaine*^ and Wulff, Andrew** "Geochemical and Petrographic Analysis of CDCS Lavas from the Casitas Shield, Chilean Andes" (Dr. Andrew Wulff)

Room 113 Undergraduate Presentations: Humanities

9:00 am **Vaught, Kasey** "Disney's *The Little Mermaid*: The Pursuit of Patriarchy" (Dr. Alison Ganze)

9:15 am **Wadlington, Meredith*** "Standing in Place: Climbing the Trees of Southern Literature" (Dr. Wes Berry)

9:30 am **Hunton, Ryan William** "Wallace Stevens in Three Centuries of American Poetry" (Dr. Deborah Logan)

9:45 am **Lawrence, Holly Anne** "What Would Dumbeldore Do?" (Dr. Ted Hovet)

10:00 am **Rogers, Kallie** "*Fish Are Jumping*" (Dr. Heidi Pintner)

10:15 am **Gensler, Melissa** "Rhonda Larson and the Flute: Ties to Spirituality and Humanity, as Displayed in *Movin' On*" (Dr. Heidi Pintner)

Room 118 Undergraduate Presentations: Humanities

9:00 am **Koeneman, Molly*** "Backstage Housewives in *Barn Burning*" (Dr. Walker Rutledge)

9:15 am **Ferguson, Rachel** "Symbolic and Moral Ambiguity in *Young Goodman Brown*, *The Birth-mark*, and *Rappaccini's Daughter*" (Dr. Sandra Hughes)

9:30 am **Acquisto, Mary Alexandra** "A Critical Analysis of Thoreau's *Walden*: 'Reading'" (Dr. Walker Rutledge)

9:45 am **Cliburn, Whitney** "Watchmen and the Transference of Time and Space from Novel to Film" (Dr. Karen Schneider)

10:00 am **Sawyers, Spenser*** "Black-hearted Bastards: Sylvia Plath's Holocaust Imagery in *Daddy* and its Significance" (Dr. Ted Hovet)

Room 138 Undergraduate Presentations: Humanities

9:00 am **Lindsey, Amy** "Success of *Silence of the Lambs*: Why We Love Serial Killers" (Dr. Ted Hovet)

9:15 am **Osburn, Kaitlen M.*** "Ambiguity and Its Reward in Hawthorne's Tales" (Dr. Sandra Hughes)

9:30 am **Looper, Amy** "My Life as Alice" (Dr. Dale Rigsby)

9:45 am **Sholar, Rachel** "Joan Didion and *The Year of Magical Thinking*: A Mastermind of the Grief Account" (Dr. Ted Hovet)

10:00 am **Osburn, Kaitlen M.*** "Milton's Trinity" (Dr. Lloyd Davies)

Room 163A Undergraduate Presentations: Social Sciences

9:00 am **Kersey, Niki*** "Semantic Effects of the Relationship between Sexuality and Aggression" (Dr. Lance Hahn)

9:15 am **Odobasic, Lada Kloi** "Gaining Access in Congress" (Dr. James Chappell)

9:30 am **Tran, Mai Nhat** "Multinational Corporations and the Development of Modern Trade and Retail Business in Vietnam" (Dr. Ian Lee)

9:45 am **Vu, Hanh T.** "Economies in Transition: A Case Study of Vietnam" (Dr. Robert Pulsinelli)

10:00 am **Smith, Chelsey Danielle** "The Effect of a Three Point Sensory Diet on Vocal and Verbal Behavior in a Non-Verbal Child on the Autism Spectrum" (Mary Lloyd Moore, M.S.)

Room 163B Graduate Presentations: Physical Sciences

9:00 am **Jones, Morgan** "A Novel Pervious Cement Reaction Barrier (PCRB) In Situ Arsenic Remediation System" (Dr. Cathleen Webb)

9:15 am **Kancharla, Jahnavi Reddy and Jain, Ajay** "Overexpression of 'Osmotin-Chitinase' Gene Chimera in Medicago to Develop Transgenics Resistant to Various Biotic and Abiotic Stresses" (Dr. Shivendra Sahi)

9:30 am **Miller, Benjamin Verlinden; Lerch, Robert N.; and Groves, Chris** "Examining the Hydrology of Carroll Cave and Toronto Springs, Missouri through Groundwater Tracing and Geochemistry" (Dr. Chris Groves and Pat Kambesis, M.S.)

9:45 am **Muneeruddin, Khaja and Williams, Kevin** "Reaction of Platinum (II) Complexes with Peptides" (Dr. Kevin Williams)

10:00 am **Porter, P. Elliott** "Human Factors Analysis in Naval Aviation" (Dr. Mark Doggett)

Room 163C Graduate Presentations: Social Sciences

9:00 am **Truba, Natalie Prisbe** "The Therapeutic Effects of a Specialized Summer Camp for Children Suffering from a Chronic Heart Condition" (Dr. Sarah Ostrowski)

9:15 am **Sadhnani, Mahesh Hiralal** "Erroneous Perception of Body Size and Suicide Contemplation among Adolescents" (Drs. Cecilia Watkins and Marilyn Gardner)

9:30 am **Epperson, Ann E.** "Internet GIS as a Historic Place-Making Tool for Mammoth Cave National Park" (Dr. Katie Algeo)

9:45 am **Aldridge, Jessica R.; West, Cassie; Hopper, Lindsay; and Hopper, Ronald** "Conceptualizing the Computer Hacker: A Content Analysis of the Media" (Ronald Hopper and Lindsay Hopper)

10:00 am **Kurlawala, Zimple A.** "Sexual Violence Risk Reduction" (Dr. Stephen Nagy)

CONCURRENT PAPER SESSION 2
10:45 am-12:15 pm

Room 112 Undergraduate Presentations: Physical Sciences

10:45 am **Strain, Jacob Michael** "Study of 4-vinylphenol Reductase" (Dr. Kinchel Doerner)

11:00 am **Batra, Sumit; Sahi, Nilesh; Turner, Camille; Mikulcik, Kristen; Shockley, Heather; and Conte, Eric** "Efficient Purification Method for Human Fibroblast Growth Factor" (Dr. Rajalingam Dakshinamurthy)

11:15 am **Woods, Kurt Wade*** "Acoustic Properties of Wood and Carbonized Wood" (Dr. Christopher Byrne)

11:30 am **Forshee, James*^ and King, Stephen*^** "Optimizing Time for Travel through Different Media" (Dr. Tom Richmond)

11:45 am **Emberton, Adam Christopher and Liang, Hui-Chen** "Amphibulator Design Project" (Dr. Mark Cambron)

12:00 pm **Logan, Brittany** "Operation and Calibration Techniques of a Rigaku X-Ray Diffractometer" (Dr. Doug Harper)

Room 113 Undergraduate Presentations: Physical Sciences

10:45 am **Baxley, Jacob Daniel*; Novikov, Ivan; and Barzilov, Alexander** "Detection and Identification of Unknown Materials Using Neutron-Gamma Spectroscopy" (Drs. Ivan Novikov and Alexander Barzilov)

11:00 am **Ayre, Andrew and Grace, Joshua** "Power Management System for Smart Grid Monitoring" (Drs. Stacy Wilson and Mark Cambron)

11:15 am **Berry, James Alex; Morrison, Travis; and Simpson, Mike** "Design of a Remotely-Controlled Mobile Platform for Field Neutron Interrogation" (Dr. Stacy Wilson and Kyle Moss)

11:30 am **Marsh, Danielle Colby; Williams, Heather Rheunna; and Wulff, Andrew** "Analysis of Sediments Exposed above the Barren River, Bowling Green, KY" (Dr. Andrew Wulff)

11:45 am **Williams, Heather Rheunna; Marsh, Danielle Colby; and Wulff, Andrew** "XRD Analysis of Fine-grained Sediments above the Barren River, Bowling Green, KY" (Dr. Andrew Wulff)

Room 138 Undergraduate Presentations: Physical Sciences

10:45 am **Stewart, Patrick Christopher* and Smith, Michael E.** "Gas-filled Paired Swimbladders: GPS for Sound Localization in Loricariid Catfishes" (Dr. Michael E. Smith)

11:00 am **Hall, Jason*; Huskey, Steve; Quintero, Reyes and Gibbs, Mitch** "Pattern of Suction Generation during Prey-Capture in an Elongate Fish" (Dr. Steve Huskey)

11:15 am **Jatczak, Justin*^ and Frazier, Leah*^** "The Role of Cell Proliferation and Cell Migration in Corneal Endothelial Wound Healing" (Dr. Kenneth Crawford)

11:30 am **Kerr, Brandon Keith** "Robot Positioning" (Dr. Stacy Wilson)

11:45 am **Hamlet, Sean and Lodmell, Matthew** "Redesign of Electrical System for Remotely Controlled ATV Platform" (Dr. Stacy Wilson)

12:00 pm **Mitchell, Holly Ruth*^** "Use of a Gamma Ray Scintillometer to Aid Stratigraphic Correlation of Mississippian and Pennsylvanian Rocks in South-Central Kentucky" (Dr. Michael May)

Room 163A Undergraduate Presentations: Humanities

10:45 am **Sizemore, Mechelle** "Social Interaction and the Development of Identity" (David Marquez, M.F.A. and Dr. Brent Oglesbee)

11:00 am **Simpson, William** "Particularism and Defining Morality" (Dr. Michael Seidler)

11:15 am **Rogers, Edward Thomas*** "Concepts of Self: Science and Buddhism" (Dr. Eric Bain-Selbo)

11:30 am **Fickel, Joel*** "Vendettas of Ink, Offenses of Blood: The Life and Literature of Pietro Aretino" (Dr. Andrea Grapko)

11:45 am **Carr, Lauren** "*Airborne* by Gary Schocker" (Dr. Heidi Pintner)

Room 163B Graduate Presentations: Physical Sciences

10:45 am **Hildebrant, Jake** "Management of Integrated Alternative Energy Curriculum" (Dr. Mark Doggett)

11:00 am **Namara, Sarah Joy** "Simplified Accounting Management: A Key Factor for a Successful Lean Organization Management" (Dr. Mark Doggett)

11:15 am **Nutakki, Gopi Chand** "A Comparison of Descriptors of Keypoints Appearance vs. Orientation Histogram" (Dr. Qi Li)

11:30 am **Anozie, Cynthia** "Effect of High Glucose Cultured Human Endothelial Cells on the Kaolin Clotting Time" (Dr. Emmanuel Iyiegbuniwe)

11:45 am **Gangula, Srilatha** "Degradation of Chlorinated Phenols in Swine Waste" (Drs. Eric Conte and John Loughrin)

Room 163C Graduate Presentations: Social Sciences

10:45 am **Barefoot, Jeffrey Allen** "President Obama's Healthcare Proposal and the Affect on Healthcare Quality" (Dr. William Mkanta)

11:00 am **Charsombut, Nottamon** "Global Leadership and Intercultural Communication Skill Needed for Global Organizations and Business" (Dr. Mark Doggett)

11:15 am **Bagwell, Matt** "Practical Applications on Group Think, Expanding Diversity, and Examining Conflict and Its Resolution" (Drs. James Chappell and Saundra Ardrey)

11:30 am **Tsao, Wan-Ting and Lee, Yu-Ting** "2010 ATMAE Presentation Proposal" (Dr. Mark Doggett)

12:00 pm **Lee, Yu-Ting and Tsao, Wan-Ting** "2010 ATMAE Presentation Proposal" (Dr. Mark Doggett)

CONCURRENT POSTER SESSION
11:00 am-1:00 pm

Room 130 Undergraduate Posters: Physical Sciences

U01 **Andrew, Kevin*^** "Identification of DNA Biomarkers for Determining Sources of Fecal Pollution in the Environment" (Rick Fowler, M.S., and Dr. Claire Rinehart)

U02 **Anyanwu, Ejike Ikenna** "African Americans' Explanations for Lung Cancer Disparities" (Dr. Della Brown White)

U03 **Bartonjo, Jane J.; Badwaik, Vivek; Evans, Jesse W.; Willis, Chad B.; and Dakshinamurthy, Rajalingam** "Hormesis Effect – Is it a Real One?" (Dr. Rajalingam Dakshinamurthy)

U04 **Bell, Aaron Christopher* and Gibson, Steven J.** "Seeing the Spiral from the Arms: Modeling the Interstellar Medium of the Milky Way" (Dr. Steven J. Gibson)

U05 **Brock, Rebecca Michaela*^ and Williams, Kevin** "Reactions of Bulky Platinum Compounds" (Dr. Kevin Williams)

U06 **Campbell, Nathan; Hill, Bruce; Santodonato, Louis; Baxley, Jacob; and Gameson, Gordon** "CAGES: A Controlled Automated Gas Environmental System" (Drs. Edward Kintzel and Doug Harper)

U07 **Delomas, Thomas*^; Cary, Miles*^; Morgan, Rebecca*^; Parke, Tyler*^; Hall, Emily*^; Matheny, Margaret*^; Liford, Madison*^; Dingman, Nash*^; and Brown, Samuel*^** "Gatton Academy Students in Nanoscience and Device Physics" (Dr. Vladimir Dobrokhotov)

U08 **Esch, Clarice*^** "Is *Collema sp*., a Gelatinous Lichen, a Sustainable Source of Nitrogen for Greenhouse and Nursery Crop Production? " (Dr. Martin Stone)

U09 **Farnsworth, Elizabeth*^; King, Rodney; and Rinehart, Claire** "Luo Khaos, a New Bacterial Virus Isolated from the WKU Campus" (Drs. Rodney King and Claire Rinehart)

U10 **Hodsdon, Samantha A. and Yan, Bangbo** "Immobilization of Ruthenium Complexes in One- Or Two- Dimensional Networks of Polyoxometallates" (Dr. Bangbo Yan)

U11 **Howard, Courtney*^; King, Rodney; and Rinehart, Claire** "Backyardigan, a Novel Bacterial Virus Isolated from Radcliff, Kentucky" (Drs. Rodney King and Claire Rinehart)

U12 **Howard, Brittney*^; King, Rodney; and Rinehart, Claire** "Discovering New Genomes in the Soil" (Drs. Rodney King and Claire Rinehart)

U13 **Huey, Sarah Kathleen and Kintzel, Edward** "Adsorption of Alcohols on Allotropes of Carbon" (Dr. Edward Kintzel)

U14 **Huffman, James** "The Effect of Endothelin-1 on the Expression of Cyclin Dependent Kinase Inhibitors in Bovine Corneal Endothelial Cells" (Dr. Kenneth Crawford)

U15 **Li, Yan Fen** "Synthesis and Structures of Two Novel Organic-Inorganic Hybrid Compounds Containing Polyoxometalates and Ruthenium(II) Complexes" (Dr. Bangbo Yan)

U16 **Malone, T. J.** "Convective vs. Non-Convective Wind Events: A WRF-Based Comparison" (Dr. Josh Durkee)

U17 **McCann, Sarah** "The Influences of Wind Velocity in Hidden River Cave" (Dr. Chris Groves)

U18 **Metcalfe, Ballard Lee*^ and Antle, Whitney*^** "Average Depths Using Variable Fill Rates" (Dr. Tom Richmond)

U19 **Missik, Justine Emilia*^; Coates, Kati; Bartley, Meridith; and Meier, Albert J.** "Eigen-analysis of Microbial Networks Added to Food Webs" (Drs. Albert J. Meier and Bruce Kessler)

U20 **Olberding, Jordan*; King, Rodney; and Rinehart, Claire** "Mycobacteriophage Luci Isolated from WKU Soil" (Drs. Rodney King and Claire Rinehart)

U21 **Perkins, Mackenzie C.; King, Rodney; and Rinehart, Claire** "Isolation and Character-ization of Wizard007, a Novel Bacteriophage" (Drs. Rodney King and Claire Rinehart)

U22 **Rader, Shelby*** "Characterization of Porous Titanium Silicates" (Dr. Aaron Celestian)

U23 **Rucks, Melinda; Webb, Cathleen; and Mulholland, Natosha** "Bio-accumulation of Mercury (Hg) in Bat Hair from Atmospheric Deposition" (Dr. Cathleen Webb)

U24 **Sangoi, Tejas*^ and Kerr, Brandon*^** "Using GIS to map the Lost River Cave System" (Pat Kambesis, M.S. and Kevin Cary, M.S.)

U25 **Scaff, Tyler*^; King, Rodney; and Rinehart, Claire** "The Phage and I" (Drs. Rodney King and Claire Rinehart)

U26 **Schrader, Sarah*^; King, Rodney; and Rinehart, Claire** "TiroTheta9, a Novel Mycobacteriophage Isolated from the Soil" (Drs. Rodney King and Claire Rinehart)

U27 **Scott, Julie S. and Kintzel, Edward** "Investigation of P-Sexiphenyl Layers Vapor Deposited onto KCl (001) by Atomic Force Microscopy (AFM) " (Dr. Edward Kintzel)

U28 **Simouth, Christopher James* and Binion, Jenna** "Flourescein Functionalized Silsesquioxane Nanoparticles: Synthesis, Characterization and Morphology" (Dr. Hemali Rathnayake)

U29 **Stinson, Chasity; Florea, Lee J.; Fowler, Rick; Brewer, Joshua; McGee, Dorien; Kearns, B. Joe; and Greco, Anthony M.** "Biofilms and Calcite Precipitation within a Cave in the Upper Floridian Aquifer, Citrus County, Florida" (Dr. Lee J. Florea)

U30 **Tope, Cynthia*^; King, Rodney; and Rinehart, Claire** "Agkelos, an Angelic Phage on Earth" (Drs. Rodney King and Claire Rinehart)

U31 **Torres, Ryan Edwards; Durkee, Joshua; and Mahmood, Rezaul** "Urbanization and Its Impacts on Precipitation around Three Urban Centers in the Kentucky-Ohio River Valley" (Dr. Rezaul Mahmood)

U32 **Van Meveren, Mayme M.** "Effect of Radiation Sources Distribution on the Effectiveness of Brachytherapy Treatment" (Drs. Ivan Novikov and Alexander Barzilov)

U33 **Vanover, Eric Scott; Pan, Alice; Lowery, Gerald; and Zhang, Rui** "Production of Highly Reactive Metal-Oxo Species with Molecular Oxygen and Light for the Selective Oxidation Catalysis" (Dr. Rui Zhang)

U34 **Walter, Anna*^ and Smith, Hunter*^** "Zeolite CGS: Ion Exchange and Synthesis" (Dr. Aaron Celestian)

U35 **Wigginton, Sara K.*; Gilkison, Victoria A.*^; Racke, Danielle M.; and Meier, Albert J.** "Ecology of *Panax quinquefolius*, American Ginseng in Mammoth Cave National Park" (Dr. Albert J. Meier)

U36 **Wilson, John Max*** "Leading Lyapunov Exponents from Predictability Times for Cosmological Models" (Dr. Keith Andrew)

U37 **Wix, Jane Marie* and Rodgers, William Nicholas** "Building a Flash Flood Climatology of the Appalachian Mountains" (Dr. Rezaul Mahmood)

Room 130 Undergraduate Posters: Social Sciences

U38 **Fite, Jessica; Xu, Jin; and Drummond, Adam** "New Ways of Learning" (Dr. Sheila Flener)

U39 **Hoehn, Kelsey and Bartek, Jordan** "New Ways of Learning" (Dr. Sheila Flener)

U40 **Robinson, Sara and Wilson, Amanda** "New Ways of Learning" (Dr. Sheila Flener)

U41 **Roe, Maggie Lian*** "Adapting to Aging in Place: An Assessment of Residential Living Facility Residents' Physical Activity Program Expectations" (Dr. Dana Burr Bradley)

U42 **Schulte, Kathleen*** "A Speech-Language Pathologist Perspective on the Referral and Assessment of Bilingual Children Whose Primary Language is not English" (Leisa Hutchison, M.S.)

U43 **Smith, Chelsey Danielle** "The Effect of a Three Point Sensory Diet on Vocal and Verbal Behavior in a Non-Verbal Child on the Autism Spectrum" (Mary Lloyd Moore, M.S.)

Room 130 Undergraduate Posters: Humanities

U44 **Baker, Lauren Emily** "Unresolved Questions in Science" (Matt Tullis, M.F.A.)

U45 **Bell, Devon Thomas** "Past, Present, and Future of Hip Hop" (Matt Tullis, M.F.A.)

U46 **Burchett, Katherine Elizabeth** "Gothic Horror Novelists" (Matt Tullis, M.F.A.)

U47 **Ciemniecki, Shanda Marie** "Looking Beyond the Concrete Jungle" (Matt Tullis, M.F.A.)

U48 **Ciemniecki, Shanda Marie** "Seeing the Anatomy" (Laurin Notheisen, M.F.A.)

U49 **Glass, Kenton** "Modern Web Designers" (Matt Tullis, M.F.A.)

U50 **Kuan, I-Ping** "Legend Puppeteer" (Matt Tullis, M.F.A.)

U51 **Lee, Jiwon** "The Great Composers" (Matt Tullis, M.F.A.)

U52 **Long, Courtney** "American Pop Art Artists" (Matt Tullis, M.F.A.)

U53 **Perry, Cathy** "Traditional Media, Contemporary Art" (David Marquez, M.F.A.)

U54 **Rivera, Roberto Apollo Theodore** "The Godfathers of Anime" (Matt Tullis, M.F.A.)

U55 **Sales, Trevor Alan** "Classic Comedy" (Matt Tullis, M.F.A.)

U56 **Sharpensteen, David Allen** "Influential 20th Century Directors" (Matt Tullis, M.F.A.)

U57 **Steele, Michael** "Fathers of Art Nouveau" (Matt Tullis, M.F.A.)

U58 **Strand, Rebecca Rose** "Great Female American Poets" (Matt Tullis, M.F.A.)

U59 **Thaman, Michael Blaine** "Zombie Pioneers" (Matt Tullis, M.F.A.)

U60 **Tyler, Joey Thomas** "The Back Bowl" (Matt Tullis, M.F.A.)

U61 **Williams, Kristopher** "Influential Contemporary Animators" (Matt Tullis, M.F.A.)

Room 130 Graduate Posters: Physical Sciences

G01 **Badwaik, Vivek; Bartonjo, Jane J.; Evans, Jesse W.; Willis, Chad B.; and Dakshinamurthy, Rajalingam** "Novel Method for Recovery of Recombinant Proteins in Their Soluble Forms from *E. coli*" (Dr. Rajalingam Dakshinamurthy)

G02 **Batra, Sumit; Sahi, Nilesh; Turner, Camille*^; Mikulcik, Kristen; Shockley, Heather; Conte, Eric; and Dakshinamurthy, Rajalingam** "Efficient Purification Method for Human Fibroblast Growth Factor" (Drs. Rajalingam Dakshinamurthy and Eric Conte)

G03 **Graves, Melinda** "Doppler-broadening of Light Nuclei Gamma-ray Spectra" (Drs. Phillip Womble, Alexander Barzilov, and Keith Andrew)

G04 **Rodgers, William Nicholas; Mahmood, Rezaul; Quintanar, Arturo I.; Loughrin, John; and Lovanh, Nanh** "A Sensitivity Study of Energy Fluxes and Evaporation from a Waste Lagoon to Different Stability Model Formulations" (Dr. Rezaul Mahmood)

G05 **Porter, Brandon Lee** "Evaluating Variability in Island Karst Disturbance in Puerto Rico from Application and Refinement of the Karst Disturbance Index" (Dr. Jason Polk)

Room 130 Graduate Posters: Social Sciences

G06 **Bhoyar, Sandhya Shamrao and Mandale, Pankaj** "Effect of Cell Phone Use on College Students" (Dr. Christine Nagy)

G07 **Bhoyar, Sandhya Shamrao "**Normative Beliefs of Students Regarding H1N1" (Drs. Christine Nagy and Steve Nagy)

G08 **Chugh, Pooja and Kumar, Chaitra Anil** "Occupational Hazards Associated with Dental Professions" (Dr. Vijay Golla)

G09 **Dhar, Sohini and Nair, Rasmi** "Healthy-home Environment: Asthma Awareness for Refugees in South-Central Kentucky" (Drs. Emmanuel Iyiegbuniwe and Steve Nagy)

G10 **Greco, Lindsey and Brown, Katie** "Personal Strategies for Increasing Exercise Intensity" (Dr. Steven Wininger)

G11 **Kaya, Crystal Marie** "Benevolent vs. Hostile Sexism: Impact on Work Performance for Women in Turkey" (Dr. Tony Paquin)

G12 **Koirala, Bhawana; Dhar, Sohini; and Sadhnani, Mahesh** "Implications and Challenges of Dental History Forms in University Dental Clinic" (Drs. Terry Dean and Christine Nagy)

G13 **Li, Chao and Shearer, Darlene** "Adolescent Knowledge and Attitudes about Sex and Abstinence: A Cross-sectional Descriptive Study" (Dr. Darlene Shearer)

G14 **Li, Chao and Shearer, Darlene** "Effectiveness of WAIT Training – an Abstinence-only Education Model" (Dr. Darlene Shearer)

G15 **Li, Chao and Fan, Frank** "Is Human Resource an Untackleable Challenge in China's Rural Health Care Reform? " (Dr. Frank Fan)

G16 **Mandale, Pankaj Anandrao; Nicholson, Thomas; Duncan, David; White, John; and Nagy, Steve** "Meditation as Stress Management in Graduate Public Health Students" (Drs. Thomas Nicholson, David Duncan, John White, and Steve Nagy)

G17 **Mandale, Pankaj Anandrao; Bhoyar, Sandhya; and Nagy, Steve** "Adolescent Stress Perception, Emotional Indicators and Risky Behaviors" (Dr. Steve Nagy)

G18 **Mandale, Pankaj Anandrao and Shearer, Darlene** "Study on University Student Attitudes, Beliefs and Perceptions Related to Academic Dishonesty" (Dr. Darlene Shearer)

G19 **Mandale, Pankaj Anandrao and Shearer, Darlene** "Faculty Insights and Experiences with Academic Dishonesty of Students" (Dr. Darlene Shearer)

G20 **Mandale, Pankaj Anandrao and Bhoyar, Sandhya** "Cultural Variation and Its Effect on Student Teacher Interaction and Learning" (Dr. Grace Lartey)

G21 **Mande, Sheetal K. and Ansari, Huma** "Factors Associated with Teeth Whitening" (Drs. Terry Dean, Steve Nagy, and Christine Nagy)

G22 **Saculla, Meghan Marie** "Moral Judgment Development, Narcissism, and Electronic Media and Communication Devices: Trends and Discussion of Future Directions" (Dr. Pitt Derryberry)

G23 **Singh, Shalini** "Racial Discrimination in Health Care Services among HIV-Infected Persons" (Dr. William Mkanta)

G24 **Ghugare, Tushar and Colon, Luis** "Exploring Zirconia as a Column Packing Material in HPLC" **(**Drs. Cathleen Webb and Eric Conte)

CONCURRENT PAPER SESSION 3
1:15-2:45 pm

Room 112 Undergraduate Presentations: Physical Sciences

1:15 pm **Merriam, Anthony** "Control Area Network Communications" (Dr. Michael McIntyre)

1:30 pm **Devore, Wes; Hamlet, Sean; and Weitzel, Charlie** "Programmable Logic Controller Trainer" (Dr. Stacy Wilson)

1:45 pm **Brady, Kathryn** "Isolation of a *Lactobacillus sp.* pep8 Bacteriophage" (Dr. Kinchel Doerner)

2:00 pm **Marquardt, Joseph R.*** "Molecular Tools for Understanding the Population Genetic Effects of Habitat Restoration" (Dr. Jeffrey Marcus)

2:15 pm **Leftwich, Kristin and Celestian, Aaron** "Synthesis and Ion Exchange of Potassium Gallosilicate TsG-1" (Dr. Aaron Celestian)

2:30 pm **Petruska, Natalie** "The Chronicles of Arsenic" (Dr. Kenneth Kuehn)

Room 113 Undergraduate Presentations: Physical Sciences

1:15 pm **Fulling, Randy Matthew; Seng, William; Pullen, Gregory; and Bertke, Sarah** "CNC Milling with Applications in Concrete Etching" (Dr. Mark Cambron, Matthew Dettman, M.S., and Ron Rizzo, B.S.)

1:30 pm **Pease, April; Strolger, Louis-Gregory; Wolff, Schuyler*; and Gott, A. M.** "The Sersic Morphologies of Thermonuclear Supernovae Host Galaxies in the Nearby Galaxies Supernova Search Data" (Dr. Louis-Gregory Strolger)

1:45 pm **Wolff, Schuyler*** "Determining the Progenitors of Type Ia Supernovae from Their Environments" (Dr. Louis-Gregory Strolger)

2:00 pm **Wink, Tara** "Modeling Acoustic Waves Using COMSOL MULTIPHYSICS" (Dr. Alexander Barzilov)

2:15 pm **Patel, Khushbu; Philips, Keith; Fields, Ashton; and Bell, Karen** "Molecular Phylogenetic Analysis of Bostrichoidea (Insecta: Coleoptera)" (Dr. Keith Philips)

Room 118 Graduate Presentations: Humanities

1:15 pm **Puglia, David** "The Culture Cache: Western Kentucky University Folklife Archives Past and Present" (Dr. Michael Ann Williams)

1:30 pm **Sanders, Kyle** "The Unfathomable, the Unforgivable, the Unpardonable: How the Literature of Hawthorne Heightens the Guilt of Shameful Sin" (Dr. Sandra Hughes)

1:45 pm **Bryan, Kendrick William** "Access to Opportunity: A Discussion of Title IX" (Dr. Patricia Minter)

Room 138 Undergraduate Presentations: Social Sciences

1:15 pm **Harrison, Samantha Lee*** "A Rational Choice Approach to Understanding the Impact of the Internet on the Political Participation of Young Voters" (Drs. Scott Lasley, Joel Turner, and Jennifer Montgomery)

1:30 pm **Bullen, Thomas Henry** "The Price of Gold: Are Mine Yields Significant? " (Dr. Michelle Trawick)

1:45 pm **Wynn, Colleen Elizabeth*** "Comparatively Tracing the Hopelessness and Disadvantaged Community Link" (Dr. Holli Drummond)

2:00 pm **Roe, Maggie Lian*** "A Student's Perspective: Using Mixed Research Methods with a Frail Population" (Dr. Dana Burr Bradley)

Room 163A Undergraduate Presentations: Humanities

1:15 pm **McCullagh, Bonnie Shae*** "'That Horrible Crime Not to Be Named among Christians'" (Dr. Carol Crowe-Carraco)

1:30 pm **Pritchett, Leah Dale*** "The Notion of False Equality" (Dr. Patricia Minter)

1:45 pm **Crites, Sarah Elizabeth*** "Revelry, Debauchery, and Blasphemy: Georgian Hell-Fire Clubs" (Dr. Carol Crowe-Carraco)

2:00 pm **Hensley, Megan K.** "Seductive Scabs" (Dr. Yvonne Petkus)

Room 163B Graduate Presentations: Physical Sciences

1:15 pm **Kunapuli, Phani Chandrika and King, Rodney** "Is Transcription of the Bacteriophage HK639 Right Operon Antiterminated?" (Dr. Rodney King)

1:30 pm **Tamarapu Parthasarathy, Prasanna** "Isolation of a Bacteriophage for *Clostridium scatalogenes* ATCC 25775" (Dr. Kinchel Doerner)

1:45 pm **Webb, Amanda** "Sound Production in Two Loricariid Catfish Species" (Dr. Michael Smith)

2:00 pm **Galbreath, William Adam; William, Todd; and Dennis, Roger** "The WKU Vineyard" (Dr. Todd William)

2:15 pm **Cross, Dean and Peimanovic, Nermin** "Higher Voltage Distribution System Feasibility Study" (Dr. Stacy Wilson)

2:30 pm **Sengul, Sevgi and Atici, Ferhan** "Modeling with Fractional Difference Equations" (Dr. Ferhan Atici)

Room 163C Graduate Presentations: Physical Sciences

1:15 pm **Wright, Alice Ann and King, Rodney** "Sequence of Bacteriophage HK239 and Comparative Genomic Analysis" (Dr. Rodney King)

1:30 pm **Wood, Matthew Vincent** "Description of a New Genus (Coleoptera: Ptinidae) of Spider Beetle and Their Diversity in South Africa" (Dr. Keith Philips)

1:45 pm **Selvaraj, Tamilselvi; Huskey, Steve; and Mahan, Margaret** "Prey-Induced Phenotypic Plasticity in the Teeth of Hatchery vs. Wild Largemouth Bass" (Dr. Steve Huskey)

2:00 pm **Gade, Prabhavathi** "Investigation of Volatile Products from Wood Pyrolysis" (Drs. Eric Conte and Chris Byrne)

UNDERGRADUATE ABSTRACTS

Acquisto, Mary Alexandra "A Critical Analysis of Thoreau's *Walden*: 'Reading'" (Dr. Walker Rutledge)

In "Nature," chapter three of Transcendentalist classic *Walden*, Henry David Thoreau emphasizes the importance of being well-versed in literature while eloquently attacking the significant lack of learned individuals who care to understand literature's classics. In my essay, I analyze and critique the Transcendentalists' ideology most associated with Thoreau as it is depicted in the context of man and intellect. I claim that Thoreau's intended coaxing of man to lead a more intellectually fulfilling life is transposed into a personal diatribe attacking what he sees as a pervasively illiterate man. I claim that while Thoreau's intentions may have been worthy, his belief in the inherent intellectual hierarchy of mankind coupled with the impracticality of his demands proves harshly cynical in the end. [page 5]

Andrew, Kevin Andrew*^ "Identification of DNA Biomarkers for Determining Sources of Fecal Pollution in the Environment" (Rick Fowler, M.S. and Dr. Claire Rinehart)

Most of Kentucky and a quarter of the world's population gets its water from underground aquifers formed in the underlying limestone. Kentucky and the Mammoth Cave region are recognized as part of the most extensive and vulnerable karst terrain on the globe. We compiled extensive DNA sequence data of the fecal-specific bacterial group *Bacteriodes* from online DNA sequence databases. These were obtained from many host species. Sequences of these genes were imported into the DNA analysis program Geneious to align sequences from different strains and look for DNA sequence features to determine how the strains from different animal and human hosts may be distinguished. Multiple simple-to-obtain parameters were compared and imported into Mathematica for multi-dimensional analysis. The results predict that different hosts can be discriminated. [page 9]

Antle, Whitney See Metcalfe, Ballard Lee

Anyanwu, Ejike Ikenna "African Americans' Explanations for Lung Cancer Disparities" (Dr. Della Brown White)

As part of a larger study of African American families affected by lung cancer, groups of relatives were surveyed: smokers vs. never smokers, and blood vs. non-blood relatives. These participants were asked what they believed to be reasons for racial disparities in lung cancer in their own words. In order to use this open-ended data in analysis, a set of codes that reflect patterns of responses was developed. In order to ensure the validity and reliability of codes, coders used standardized definitions to assign numbers to each response. They practiced until agreement in coding decisions among multiple coders was achieved. The final product is a code-book that lists and defines all possible codes. [page 9]

Ayre, Andrew and Grace, Joshua "Power Management System for Smart Grid Monitoring" (Drs. Stacy Wilson and Mark Cambron)

The Power Management System for Smart Grid Monitoring is a device that is used for measuring various power line parameters. This particular device is attached to the power line and consists of individual sensors equipped with circuitry for various applications. The monitoring system will accurately measure voltage, current, and temperature of residential distribution and overhead power lines, and send this data along with GPS location wirelessly to a monitoring station. The final device will operate within the distribution level voltage ranges and currents of 69 kV and 0 to 300 amps, respectively. The data from each sensor will be interpreted by a microprocessor. This device will allow power companies to monitor whether certain areas of their power grid meet the required power needs of that system. [page 7]

Baker, Lauren Emily "Unresolved Questions in Science" (Matt Tullis, M.F.A.)

The objective of my student research project is to create a series of three posters that center on the overall theme of science. The resulting art pieces will convey my research on three separate branches of science: astronomy, biology, and chemistry. I will use digital collage to achieve this objective. I will research each of the three branches of science that I have chosen and will pinpoint the advances in each field that I believe best defines that branch of science and I will translate that information into images. The resulting three posters will be similar enough to be easily identified as belonging to the same series but each will uniquely represent its respective subject. [page 11]

Bartek, Jordan See Hoehn, Kelsey

Bartley, Meridith See Missik, Justine Emilia

Bartonjo, Jane J.; Badwaik, Vivek; Evans, Jesse W.; Willis, Chad B.; and Dakshinamurthy, Rajalingam "The Hormesis Effect – Is it a Real One?" (Dr. Rajalingam Dakshinamurthy)

Hormesis is a binary response phenomenon with low-dose stimulation (or inhibition) of effects by substances producing opposite responses at a high does. *Escherichia coli* cells are one of the most widely used hosts for the production of heterologous proteins and its genetics are far better characterized than those of other microorganisms. Recent progress in the fundamental understanding of transcription, translation, and protein folding in *E. coli*, together with serendipitous discoveries and the availability of improved genetic tools, are making this bacterium more valuable than ever for the expression of complex eukaryotic proteins. In the recent past nanomaterials especially gold nanomaterials are considered to revolutionize many arenas, including nanomedicine and nanodiagnostics. In this context, we aim to exploit the effect of potassium tetrachloroaurate (III) hydrate in the growth of two different *E. coli* systems. In addition, correlation between recombinant protein expression yields and the concentration effect is discussed. [page 9]

Bartonjo, Jane J. See Badwaik, Vivek in Graduate Abstracts

Baxley, Jacob Daniel*; Novikov, Ivan; and Barzilov, Alexander "Detection and Identification of Unknown Materials Using Neutron-Gamma Spectroscopy" (Drs. Ivan Novikov and Alexander Barzilov)

Neutron gamma spectroscopy is a non-destructive method used to analyze the chemical composition of unknown substances. A neutron interrogation system to detect and identify materials is under development at the WKU Applied Physics Institute. Neutrons emitted from the source interact with nuclei inside the interrogated container and excite them. Excited nuclei emit gamma-rays with energies specific to chemical elements. The proposed system detects these gamma-rays and makes decisions on possible chemical composition. A special algorithm was developed to simulate and analyze experimental spectra from various substances. The decision-making algorithm was developed and implemented based on obtained results. [page 7]

Baxley, Jacob Daniel See Campbell, Nathan

Bell, Aaron Christopher* and Gibson, Steven J. "Seeing the Spiral from the Arms: Modeling the Interstellar Medium of the Milky Way" (Dr. Steven J. Gibson)

Our home galaxy, the Milky Way, has been a focus of astrophysical research since before we knew there were other galaxies in the universe, but in a number of ways it remains mysterious. The exact size, and spiral arm structure of the Milky Way are still poorly understood. Observation has been instrumental in uncovering what we do know about our galaxy, but theoretical models interpreting these results are also crucial. Our model tests possible relationships between different kinds of interstellar gas observed with radio telescopes. With warm atomic gas as a background, we have run a series of models with the cold atomic gas and colder molecular gas in different parts of the spiral arms, to determine how stellar evolution, involving the compression of these gases entering the arms, would appear in radio surveys. [page 9]

Bell, Devon Thomas "Past, Present, and Future of Hip Hop" (Matt Tullis, M.F.A.)

Focusing on the past, present, and future of Hip Hop music, the project consists of posters of three legends that changed societies perception of Hip Hop. The first poster is Run-DMC, who – with the help of Def Jam records, Joseph "Run," Darryl "D.M.C.," and Jason "Jam-Master Jay"– put Hip Hop on the map. The next poster is of Nas, whose debut album *Illmatic* is considered one of the best albums in the genre. The next artist I picked is a personal favorite, whom I believe will be the future of Hip Hop, The Cool Kids. Mikey Rocks and Chuck Inglish are leaving the trend of rhyming about violence and taking Hip Hop back to its roots. [page 11]

Bell, Karen See Patel, Khushbu

Berry, James Alex; Morrison, Travis; and Simpson, Mike "Design of a Remotely-Controlled Mobile Platform for Field Neutron Interrogation" (Dr. Stacy Wilson and Kyle Moss)

This project was conducted to fill a void in the scientific community for a mobile neutron interrogation platform. It can also open new possibilities in the future for scientific experiments to be conducted in the field. Some of the problems we were faced with include keeping the equipment from being bombarded with neutrons using shielding and placement. Also, we had to make a frame that dispersed the weight of the equipment evenly across the ATV so it would be stable. We also designed systems to control mechanical functions like steering and braking. We approached these problems based on a past project and expanded on its successful attributes while re-engineering its failures. We were successful in creating a working, durable platform that is also very adaptable to many different experiments and weather conditions. [page 7]

Bertke, Sarah See Fulling, Randy Matthew

Binion, Jenna See Simouth, Christopher James

Brady, Kathryn "Isolation of a *Lactobacillus sp.* pep8 Bacteriophage" (Dr. Kinchel Doerner)

In samples from the swine lagoon on WKU's farm, an anaerobic lactobacillus strain was isolated and found to convert p-coumaric acid to pEP, a malodorant found in swine waste. Anaerobic *Lactobacillus sp.* pep8 was grown in various media at

room temperature. First, Mitomycin C was used to induce any viable prophage, measured as a drop in the optical density. Second, eighteen environmental samples were collected and grown with pep8 then centrifuged and filtered to isolate phage. Plaque assays were then performed in sets of three cycles to confirm appearance of phage plaques. Sixteen environmental samples produced potential phage after multiple purifications. pep8 does not possess a viable prophage since there was no drop in optical density. After placing samples under the TEM, it was found that no phage had been isolated. [page 14]

Brewer, Joshua See Stinson, Chasity

Brock, Rebecca Michaela*^ and Williams, Kevin "Reactions of Bulky Platinum Compounds" (Dr. Kevin Williams)

Several platinum (II) complexes have been known to exhibit anticancer activity by reacting with guanine residues to distort the DNA helix and promote cell death. We have synthesized a series of platinum (II) compounds and then tested reactivity with DNA and protein residues. Results from this research have shown that the size and shape of the complexes affects reactivity with DNA and especially with protein residues. We are now synthesizing platinum compounds that utilize the diamine ligand N, N-dimethylethylenediamine. By changing certain variables, the yield and purity of a synthesized sample has been found to change drastically. [page 9]

Brown, Samuel*^ See Delomas, Thomas

Bullen, Thomas Henry "The Price of Gold: Are Mine Yields Significant? " (Dr. Michelle Trawick)

In 1971 President Richard Nixon officially broke the U.S. dollar from its convertibility to gold, signaling the beginning of our faith-based monetary system. Since then, the price of gold has been particularly meaningful. As a true store of value, gold continues to be hoarded by those who have lost the faith, and feel the dollar is dangerous. It is the author's belief that the less secure investors feel with the dollar, the more they demand gold and the higher the price of gold will rise. An important component of the author's theory is that the gold mined in a given year (traditionally considered "supply") will have a negligible impact on the behavior of this price. In this paper, regression analysis with time series data is used to show conclusively that gold mining yields are not a statistically significant determinant of gold price. [page 15]

Burchett, Katherine Elizabeth "Gothic Horror Novelists" (Matt Tullis, M.F.A.)

The object of my student research project is to create effective visual communication that centers on three influential gothic horror authors in the 1800s: Bram Stoker, Mary Shelley, and Oscar Wilde. Bram Stoker is best known for his book, *Dracula*, which he wrote in 1897. This classic has played a major role in the popularity of vampires today. Mary Shelley wrote the best seller, *Frankenstein*, in 1818. Oscar Wilde is known for his novel, *The Picture of Dorian Gray*, which he wrote in 1891. Although he wrote many plays, this was his only published novel. I propose to communicate my newfound knowledge with three pieces of digital collage art. [page 12]

Campbell, Nathan; Hill, Bruce; Santodonato, Louis; Baxley, Jacob; and Gameson, Gordon "CAGES: A Controlled Automated Gas Environmental System" (Drs. Edward Kintzel and Doug Harper)

The AGES project will provide a system designed to automatically control the delivery of up to ten gases to a sample for experiments to be carried out using the Powder Diffractometer (POWGEN, Beamline 11-A) at the Spallation Neutron Source (SNS) located at Oak Ridge National Laboratory (ORNL). The system will monitor and maintain the flow of each individual gas to the sample during an experiment. During operation the hardware will be isolated but located near the instrument. The gases supplied to the system will be located exterior to the SNS target building, and a user interface in the software will allow remote access with the hardware over an Ethernet connection. The PAGES project will allow the flow of up to three gasses but is portable enough to enable its transportation between beamlines. [page 9]

Carr, Lauren "*Airborne* by Gary Schocker" (Dr. Heidi Pintner)

A flute players' repertoire ranges from easy to professional on a difficulty level. Gary Schocker's piece for flute and piano, Airborne, is ranked between advanced and professional by some of today's most virtuosic flute players. To help understand and master this piece, Schocker's biography and how the piece came to be will be discussed. Also, the piece has been analyzed to understand the form in which it has been composed and various techniques to be used in the piece. The piece demonstrates many challenges for a flute player that must be overcome by the help of practice and performance techniques. [page 8]

Cary, Miles*^ See Delomas, Thomas

Ciemniecki, Shanda Marie "Looking Beyond the Concrete Jungle" (Matt Tullis, M.F.A.)

My visual research project focuses on the efforts of architects to change the public's idea of what a building should be. Great architecture asks us to look beyond concrete jungles and appreciate buildings for the risks they take. The resulting digital collage will show the mind-bending architectural accomplishments of Frank Gehry, Eric Owen Moss and Frank Lloyd Wright. Gehry explores the use of form and surface beyond modern definition. Moss takes existing structures and attempts to reinvent the past by generating new urban structures. Wright built the unexpected while blending the design into the surrounding landscape by using organic and local materials. These men have taken our skylines beyond what seems possible with unique design concepts that give their buildings a personal flare and set them apart from generic department stores. [page 12]

Ciemniecki, Shanda Marie "Seeing the Anatomy" (Laurin Notheisen, M.F.A.)

The objective of my research was to create fine art collagraph prints that show a study of anatomy that asks the viewer to see the parts along with the whole. The idea was to see if the viewer would recognize the animal and human body parts used to create a fantastic creature. The resulting prints began with images of collaged human and animal hands, feet, heads, and bone structures from old children's encyclopedias and old anatomy texts. These challenged the viewer to see new creatures in spite of recognizable features. Collagraph textures created a bridge between a flat paper doll and a tactile skin, blending the animal and human parts together creating one visual figure. [page 12]

Cliburn, Whitney "Watchmen and the Transference of Time and Space from Novel to Film" (Dr. Karen Schneider)

In my paper, I analyze director Zack Snyder's film adaptation of Alan Moore's and Dave Gibbon's graphic novel, Watchmen. I argue that Snyder uses the visual elements of film to move beyond the two-dimensional paneled layout of comic book narration, all while illustrating the effects of time on the characters in the work. Drawing on examples from the movie, I explore how such cinematic techniques as match cuts and intercutting allow viewers of the film to press pause and rewind in their minds, traversing the linear narration of the graphic novel. I also examine the film's many motifs and symbols and use them to connect to the overall themes of the work, such as growing old and searching for meaning. As with the characters in the work itself, I assert that Snyder's adaptation uses the new methodologies of one media to freshen up the old. [page 5]

Coates, Kati See Missik, Justine Emilia

Cook, Kyle Wayne "Recent Results of the WKU Blazar Monitoring Project with Cross Correlations from the Fermi Gamma Ray Space Telescope" (Dr. Michael T. Carini)

In 2000 the Department of Physics and Astronomy began an intensive monitoring project of a subclass of active galactic nuclei called blazars. Since the beginning of this project there has been great progress made in our understanding of the blazar phenomena, as well as great increases in the number of sources that we monitor and the equipment we use. Today one of the focuses of the project is the use of our long-term optical light curves with the gamma ray data made public by the Fermi Gamma Ray Space Telescope to run cross correlations and discover time lags in the flaring states of the monitored blazars. Such analysis will result in a greater understanding of the dynamics occurring in the jets of these objects. In this presentation we provide a brief explanation of blazars and the equipment used before discussing the results from the initial cross correlations performed on Blazar 3C 454.3. [page 4]

Crites, Sarah Elizabeth* "Revelry, Debauchery, and Blasphemy: Georgian Hell-Fire Clubs" (Dr. Carol Crowe-Carraco)

The Knights of the Order of St. Francis, also known as the Medmenham Monks, were a group of men who met at Medmenham Abbey in Buckinghamshire during the mid-1700s. Known for debauchery and pagan worship, it is possible that many of the rumors spread about the Friars (as the members of the group are known) are completely true, although grossly exaggerated. While a sex club for the most part, many of the rumors concerning Satan worship were untrue, possibly stemming from the activities of earlier hell-fire clubs. The actions of the Knights of the Order of St. Francis were kept very secret, and many of their activities were never revealed. [page 15]

Delomas, Thomas*^; Cary, Miles*^; Morgan, Rebecca*^; Parke, Tyler*^; Hall, Emily*^; Matheny, Margaret*^; Liford, Madison*^; Dingman, Nash*^; and Brown, Samuel*^ "Gatton Academy Students in Nanoscience and Device Physics" (Dr. Vladimir Dobrokhotov)

Nanoscience is a relatively new and complex area of research, involving the combined knowledge of fundamental studies of condensed matter physics, materials science and engineering, chemistry, biology, etc. Combining knowledge from different areas, nanoscience gives new and innovative solutions to some of the most important problems of modern society. At present, fabrication of sensors is probably one of the most promising applications of nanomaterials. Students from Gatton Academy of Mathematics and Science actively participate in nanoscience studies conducted at the Department of Physics and Astronomy and Applied Physics Institute at WKU. This presentation provides a summary of their initial experiments and findings. [page 9]

Devore, Wes; Hamlet, Sean; and Weitzel, Charlie "Programmable Logic Controller Trainer" (Dr. Stacy Wilson)

Logan Aluminum is a world class manufacturer of aluminum sheet products with capabilities and experiences in fabrication of rigid container sheet, building products, automotive sheet, distributor sheet, and food can stock markets. Logan Aluminum uses Programmable Logic Controller (PLC) Trainers to teach and prepare new employees who will be working in the plant how to use PLCs to control various machines and devices. The scope of this project is to design and construct a PLC Trainer for Logan Aluminum. The advantage of this PLC trainer is the capability to be used to create specific situations for an employee to troubleshoot. Allowing employees to train on a PLC without damaging expensive equipment is another advantage for Logan Aluminum. Our Senior Design Team will use Logan Aluminum's specifications to create the needed circuit wiring. [page 14]

Dingman, Nash*^ See Delomas, Thomas

Downen, Matthew Ross* "Geochemical History of the Casitas Shield" (Dr. Andrew Wulff)

The Descabezado Grande Cerro Azul Volcanic Complex is located in the Southern Volcanic Zone (SVZ) of the Chilean Andes. It is characterized by the glacially incised Casitas Shield, a plateau comprised of multiple stacks of lava flows.

Samples were collected in stratigraphic order from eight vertical sections from the southern flank of the Casitas Shield and analyzed for complete major and trace element concentrations. This study focused on samples from three eruptive episodes exposed in the CDCS section in order to determine the petrogenetic processes responsible for modifying the magma composition from the original source. They are more primitive compared to the rest of the complex as shown by generally low concentrations of LILE. PLM and SEM analysis revealed sieve-textures and zoning in feldspar to support magma mixing. [page 4]

Drummond, Adam See Fite, Jessica

Durkee, Joshua See Torres, Ryan Edwards

Emberton, Adam Christopher and Liang, Hui-Chen "Amphibulator Design Project" (Dr. Mark Cambron)

The Amphibulator is a microcontroller based system which facilitates time-lapse recordings in remote locations. It is currently being used to study the vocalizations of amphibians in the Green River area of Kentucky and Madrid Spain. The newly redesigned Amphibulator will address many of the problems with the original design, including: the high cost per unit and the limited battery life. The new Amphibulator will incorporate a low-cost, low-power microcontroller, energy efficient surface mount components and a solar charger to help extend the battery life allowing less frequent battery changes. The system will remain easily reprogrammable with a C based programming language for ease of use and flexibility for the researchers. [page 7]

Esch, Clarice*^ "Is *Collema sp*., a Gelatinous Lichen, a Sustainable Source of Nitrogen for Greenhouse and Nursery Crop Production? " (Dr. Martin Stone)

Atmospheric fixation of nitrogen by terrestrial cyanobacteria is important in "soil crusts" of arid land ecosystems worldwide. In the absence of soil organic matter and nitrogen-fixing legumes or other higher plants, they are the primary vehicle for the introduction of nitrogen in these habitats. While some cyanobacteria dwell in soil crust matrices, others are symbionts with a fungus forming a lichen, which live above the soil line. The gelatinous lichen, Collema sp., is native to Warren County, Kentucky inhabiting bare soil. During periods of sufficient soil moisture, it fixes nitrogen and photosynthesizes and its appearance is altered from a dry, hard flake to hydrated, swollen, and jelly-like. Our hypothesis suggests that Collema sp, could be utilized as a partial replacement for nitrogen fertilizer in greenhouse and nursery crops where it would inhabit the surface of the potting media and contribute nitrogen continuously at each watering event. The results of greenhouse studies will be presented and implications discussed. [page 9]

Evans, Jesse W. See Badwaik, Vivek. in Graduate Abstracts

Evans, Jesse W. See Bartonjo, Jane J.

Farnsworth, Elizabeth*^; King, Rodney; and Rinehart, Claire "Luo Khaos, a New Bacterial Virus Isolated from the WKU Campus" (Drs. Rodney King and Claire Rinehart)

There are approximately 1031 bacteriophages on the planet, of which only 579 have been sequenced and archived. Using *Mycobacterium smegmatis* as a host, a new bacteriophage was isolated from a soil sample collected near Florence Schneider Hall on the WKU campus. The phage was purified and its morphology was determined by electron microscopy. The purified phage was designated "Luo Khaos." The genomic DNA from Luo Khaos was isolated and analyzed by DNA restriction analysis and gel electrophoresis. By comparing these results to the results from other students in the Biology Department's Genome Discovery and Exploration program, it was determined that Luo Khaos is a unique bacteriophage. [page 9]

Ferguson, Rachel "Symbolic and Moral Ambiguity in *Young Goodman Brown*, *The Birth-mark*, and *Rappaccini's Daughter*" (Dr. Sandra Hughes)

Within this paper, I examine the symbolism and characters contained in three of Nathaniel Hawthorne's most popular short stories: *Young Goodman Brown*, *The Birth-mark*, and *Rappaccini's Daughter*. I analyze the ambiguity of Hawthorne's symbols, the dubious nature of the morality of his characters and how different understandings of each could affect an individual's reading of Hawthorne's work. With regard to *Young Goodman Brown*, the religious symbolism and Goodman Brown's questionable behavior are explored. The blemish which gives *The Birth-mark* its name is considered alongside Aylmer's controversial morality. The ambiguous Biblical allusion contained within *Rappaccini's Daughter* is examined in relation to the morality it defines in respect to the characters. [page 5]

Fickel, Joel* "Vendettas of Ink, Offenses of Blood: The Life and Literature of Pietro Aretino" (Dr. Andrea Grapko)

The obscure and controversial life of Pietro Aretino, Italian dramatist, poet, and father of both art criticism and modern pornographic literature, is explored in this essay. His long literary career is dissected, from the satiric comedy La Cortigiana to his infamous lust sonnets to his religious books and his letters of blackmail received by princes and priests. Like a Shakespearean hero, he was a larger-than-life character of enormous influence whose demise could perhaps be attributed to his hubris. But unlike Macbeth, Aretino seems to have suffered a worse kind of death: the death of his artistic immortality, his name. Only recently have scholars agreed to unearth Aretino, reevaluate him, brush away virulent labels, and, perhaps, to give this fascinating Renaissance shadow a sliver of the illumination which he has long been denied. [page 8]

Fields, Ashton See Patel, Khushbu

Fite, Jessica; Xu, Jin; and Drummond, Adam "New Ways of Learning" (Dr. Sheila Flener)

When starting the research process for the IDEC project out most important goal was to exhaust all of our resources. Knowing that WKU's campus is host to two libraries itself we took a trip to visit someone who would understand the workings and necessities of our project. While at the library we were able to talk to Brent Long. Mr. Long helped us to understand what modern libraries needed to include to stay up to date with today's every changing technology. We researched different ideas for flooring and for furniture that could be included in both the individual meeting room and in the cafe. One website that proved to be extremely helpful with this was freshome.com. When thinking of a design concept we decided to include a Japanese flare to our design. Some websites that helped us accomplish this are orientalfurniture.com and japanesestylelighting.com. Since we had already taken a look at Western's campus we thought it might be beneficial to look at some libraries in other colleges around the U.S. so we looked at the learning commons at North Carolina State University. We found information at ncsu.edu that helped us get an idea of the relationship of space in a floor plan of this sort. This proved to be a helpful starting place to formulating a design that would be both pleasing to the eye and efficient. Design Concept Statement: A university library is busy place and is not used only for study anymore. A library in today's modern world must be adaptability to new technologies and incorporate new elements, such as computers, Wi-Fi internet, and new entertainment media like CDs and DVDs. The library still must have the common necessities of a library like a common area for students, a quiet area for study, and even a small area for those spending long periods of time in the building. The tranquility of the Japanese culture would seem most appropriate to use in the calm, quiet place. The colors and materials used will be relaxing and soothing making it a place where not only where students will have to study but a place where students will want to study. [page 11]

Flynn, Elaine Denise*^ and Wulff, Andrew "Geochemical and Petrographic Analysis of CDCS Lavas from the Casitas Shield, Chilean Andes" (Dr. Andrew Wulff)

Samples of lava flows from the Casitas Shield portion of the Descabezado Grande-Cerro Azul (DGCA) volcanic complex in the Chilean Andes were studied in order to develop models of their origin. Seven samples were chosen, which had been collected in stratigraphic order from a glacially-encised valley on the southern side of the complex. Whole-rock geochemistry and petrographic analysis confirm that the lavas are basaltic andesites (wt% SiO2 = 50.4 â€"53.03; wt% MgO = 3.9 - 5.8), and tholeiitic in affinity. Concentrations of both compatible and incompatible elements are relatively low for SVZ basalts. Samples are dominated by plagioclase feldspars, many of which exhibit seriate texture, and sparsely olivine- and pyroxene-phyric. Textures (compositional zoning, mantling, resorption, etc.) in some lavas are consistent with changes in the magma chemistry during cooling prior to ascent and eruption. Olivine and feldspar glomerocrysts and zoning are evidence of disequilibrium. [page 4]

Forshee, James*^ and King, Stephen*^ "Optimizing Time for Travel through Different Media" (Dr. Tom Richmond)

There is a famous calculus problem involving the minimization of travel time between two points when the path requires travel through different media, each having different rates of travel. Suppose that one is standing on the edge of an elliptical "pond," that is, where the area enclosed by the ellipse is composed of one media and the area outside the ellipse is composed of another media, and that one has different rates of travel through these media. What is the optimal path to travel from one point on the ellipse to another, given the eccentricity of the ellipse and the rates of travel through the separate media? Surprising results arise in the case for the ellipse of eccentricity 0, a circular "pond."[page 7]

Fowler, Rick See Stinson, Chasity

Frazier, Leah*^ See Jatczak, Justin

Fulling, Randy Matthew; Seng, William; Pullen, Gregory; and Bertke, Sarah "CNC Milling with Applications in Concrete Etching" (Dr. Mark Cambron, Matthew Dettman, M.S., and Ron Rizzo, B.S.)

WKU's student ASCE branch is a national power in the annual concrete canoe competition. An interdisciplinary student team composed of Electrical, Mechanical, and Civil Engineers is designing a CNC cutting tool to engrave artistic designs on the surface of the canoe. The system converts images and letters into code to engrave the design into surface of the canoe. The CNC cutting tool has four degrees of freedom that allow the engraver to move left to right, up and down, along the length of the canoe, and also towards and away from the canoe to engrave into the concrete. The C.N.C. driver controls the stepper motor movements and interprets the programming language. The system positions a simple Dremel Tool to engrave into the concrete. [page 14]

Gameson, Gordon See Campbell, Nathan

Gensler, Melissa "Rhonda Larson and the Flute: Ties to Spirituality and Humanity, as Displayed in *Movin' On*" (Dr. Heidi Pintner)

Flute players, for millennia, have been using their instrument to evoke images of mystical incantations, sorcery, seduction, and spirituality. This is also true of contemporary flutist Rhonda Larson, whose approach to music, whether it be performing, composing, teaching, or listening, creates a very clear connection between the flute and spirituality. In particular, this essay provides a theoretical and form analysis of the development and compositional techniques used in Larson's original composition *Movin' On* for solo flute, along with an overview of the performance challenges of the work. [page 5]

Gibbs, Mitch See Hall, Jason

Gilkison, Victoria A.*^ See Wigginton, Sara K.

Glass, Kenton "Modern Web Designers" (Matt Tullis, M.F.A.)

The objective of my student research project is to create effective visual communication that centers around three prominent artists and their approach to modern web design. These artists include Tim Van Damme of Made by Elephant, Dan Cederholm of Simplebits, and Mark Boulton of Mark Boulton Design. Each designer has his specific style, ranging from standards-based to pushing browsers to their limits. My digital collages will highlight these styles by displaying certain designs from each artist's portfolio. I wish to show in my three digital collages the current consensus of where web design is headed, as well as what truly is possible in a browser. [page 12]

Gott, A. M. See Pease, April

Grace, Joshua See Ayre, Andrew

Greco, Anthony M. See Stinson, Chasity

Hall, Emily*^ See Delomas, Thomas

Hall, Jason*; Huskey, Steve; Quintero, Reyes and Gibbs, Mitch "Pattern of Suction Generation during Prey-Capture in an Elongate Fish" (Dr. Steve Huskey)

Much research has been devoted to suction feeding in fish, but little is known about the dynamics of subambient pressure change inside the mouth. Trumpetfish serve as an ideal organism for determining the pattern of suction generation inside the buccal cavity. In fish with elongated skulls or jaws, there is a potential trade-off with feeding performance that likely shapes their feeding behavior. By employing pressure transducers implanted in the back and front of the buccal cavity, we observed that: 1)the pressure is initially generated in the back, 2)there is an average drop in pressure of -5.42kPa, and 3)there is a 4ms time delay between the two peaks. We hypothesize that evolution of body-length sesamoid tendons has allowed trumpetfishes to overcome the potential trade-off between body shape and subambient pressure translation. [page 8]

Hamlet, Sean See Devore, Wes

Hamlet, Sean and Lodmell, Matthew "Redesign of Electrical System for Remotely Controlled ATV Platform" (Dr. Stacy Wilson)

A remotely controlled ATV platform was built and tested prior to this current project. A second version of this ATV platform was needed, and so were many updates to the electronic system to control the ATV. In order to properly define what updates were needed, we had to understand the current system and how it works. A Microsoft Visual Basic GUI was used to be the program that controls the ATV Platform's functions of starting, stopping, moving forward and backward, turning left and right, and shifting up and down in gear. There were several program glitches, which included incorrect order of code, improper use of subroutines, missing delays, and incorrect Boolean logic. Each of these problems had to be taken into consideration. And along with these problems a more simple and precise redesign of the external electrical system was needed. [page 8]

Harrison, Samantha Lee* "A Rational Choice Approach to Understanding the Impact of the Internet on the Political Participation of Young Voters" (Drs. Scott Lasley, Joel Turner, and Jennifer Montgomery)

This paper develops a theoretical framework for understanding how the Internet and social networking sites affect political behavior with a primary focus on young voters. While the Internet has limited impact upon young voters as a persuasive tool, it does function as an affirmation tool to encourage political participation among young voters already interested in the political process. In particular, the Internet and social networking sites reduce the cost of participation for young voters which can help explain the surge of voter turnout and participation in the 2008 presidential election. [page 15]

Hill, Bruce See Campbell, Nathan

Hensley, Megan K. "Seductive Scabs" (Dr. Yvonne Petkus)

This is a presentation that will illustrate my reaction to a semester of research on intimacy and pornography. I saturated my mind with this imagery that left a residue which allowed me to create an abstraction based on those memories. The seduction from the fantasy-based videos were difficult to watch and impossible to look away from. Hopefully my work evokes some sort of awareness towards sexuality and asks the viewer to experience my interpretation of these sources. [page 15]

Hodsdon, Samantha A. and Yan, Bangbo "Immobilization of Ruthenium Complexes in One- Or Two- Dimensional Networks of Polyoxometallates" (Dr. Bangbo Yan)

In order to increase the efficiency of the charge-separation reaction between an excited photosensitizer and an appropriate electron acceptor, Our strategy is to separate ruthenium complexes in solids using nano-sized polyoxometallates through chemical bonding. Here we report the synthesis, structures and properties of two new organic-inorganic hybrid compounds which are synthesized under hydro/solvothermal conditions. Compound 1, KNa[Ru(bpy)3]2[H2W12O40]•8H2O (bpy = 2,2'-bipyridine) was synthesized in the reaction of RuCl3, bpy, and Na6W12O40•xH2O in water/methanol. Compound 2,

K6[Ru(pzc)3]2[SiW12O40] •xH2O (pzc = pyrazine-2-carboxylic acid), was synthesized in the reaction of RuCl3, pzc, and H4SiW12O40•xH2O water/methanol. These compounds have been characterized using various methods. [page 9]

Hoehn, Kelsey and Bartek, Jordan "New Ways of Learning" (Dr. Sheila Flener)

Research, as well as personal experiences, cast a shadow over the library experience. Libraries are stereotypically known as the dismal space students are provided to study and to research. Traditional libraries are identified by their customary design and appeal, with little inspiration for the inhabitants. Visiting the on-campus library provided insight on several important design concepts to be addressed for an updated learning commons. The key point drawn from the research is that the traditional library is in dire need of modification. Libraries should draw populations in, encouraging learning with inspiring and technologically advanced environments. [page 11]

Howard, Courtney*^; King, Rodney; and Rinehart, Claire "Backyardigan, a Novel Bacterial Virus Isolated from Radcliff, Kentucky" (Drs. Rodney King and Claire Rinehart)

The purpose of our research in the Genome Discovery and Exploration class was to isolate and characterize new bacteriophages from the environment. Phage are the most abundant biological entities on earth, but only a small fraction have been identified and studied. To perform our experiment we used *Mycobacterium smegmatis* as the host. A soil sample was collected from my backyard in Radcliff, Kentucky. Mycobacteriophages were recovered from the soil sample by looking for plaques on a lawn of the bacterial host. A single plaque was picked and subjected to a phage infection and plating procedure to ensure that a single phage type was recovered. An electron microscope was used to examine the morphology of the purified phage which was named "Backyardigan" to reflect the sampling location. The genomic DNA of Backyardigan was isolated and analyzed and the complete DNA sequence was determined. Students in the Genome Discovery and Exploration class will annotate the genome using bioinformatics tools. [page 10]

Howard, Brittney*^; King, Rodney; and Rinehart, Claire "Discovering New Genomes in the Soil" (Drs. Rodney King and Claire Rinehart)

There are millions of bacteriophage in the world, but most have yet to be discovered. The purpose of research conducted in the Genome Discovery and Exploration class, was to find novel bacteriophages that could specifically infect and grow on the bacterium *Mycobacterium smegmatis*. A soil sample was collected from Saunder Springs Nature Preserve in Radcliff, KY. The presence of phage in the soil was determined by looking for plaque formation on a lawn of *M. smegmatis* cells. The phage was purified and named "Spring" to reflect the sampling location. Electron microscopy was used to characterize the morphology of the phage and to insure that only a single type was present. The genomic DNA from Spring was isolated and the concentration was determined with a spectrophotometer. The phage DNA was digested with restriction enzymes and the products were examined by gel electrophoresis. The results of this analysis suggest that Spring is a unique bacteriophage. [page 10]

Huey, Sarah Kathleen and Kintzel, Edward "Adsorption of Alcohols on Allotropes of Carbon" (Dr. Edward Kintzel)

A series of experiments were carried out to study the effect of alkyl chain length on the adsorption kinetics of alcohols onto three allotropes of carbon. Four alcohols (methanol CH3OH, ethanol CH3CH2OH, propanol CH3(CH2)2OH, and butanol CH3(CH2)3OH) were employed in adsorption studies carried out at room temperature on three high surface area carbon substrates, exfoliated graphite (Grafoil), carbon aerogels, and buckminsterfullerene C60. Changes in adsorbate mass over time were noted and converted to reflect the percent coverage on the substrate by estimating the surface area occupied by individual molecules. Trends in the rate of adsorption were observed that are correlated to the length of the alkyl chain. As this length increases the rate of adsorption decreases for each of the carbon substrates. Differences in adsorption rates were also observed as a function of the carbon allotrope. These differences can be understood qualitatively as being related to the surface geometry. [page 10]

Huffman, James "The Effect of Endothelin-1 on the Expression of Cyclin Dependent Kinase Inhibitors in Bovine Corneal Endothelial Cells" (Dr. Kenneth Crawford)

The purpose of this study is to determine whether the down regulation of a cyclin-dependant kinase inhibitor (p27kip1) by endothelin-1, will overcome G1 phase arrest and promote cell cycle progression in bovine corneal endothelial cells (BCEC). The location and expression of cyclin dependant kinase inhibitors (CDKIs) in response to endothelin-1 was determined by immunofluorescence techniques in primary cultures of BCEC. Confluent and actively growing cells were treated with 20nM endothelin-1 for 24h and fixed in 4% paraformaldahyde. Cells were incubated overnight with rabbit anti-p27kip1 followed by a goat anti rabbit-FITC conjugate. Fluorescence microscopy revealed a distinct nuclear localization of p27kip1 in confluent, contact inhibited cells. The nuclear staining was greatly reduced in actively growing cells. Treatment of BCEC with endothelin-1 resulted in a reduction in the nuclear localization of p27kip1. Endothelin-1 down-regulation of p27kip1 may promote cell cycle progression and subsequent cell proliferation. [page 10]

Hunton, Ryan William "Wallace Stevens in Three Centuries of American Poetry" (Dr. Deborah Logan)

In Three Centuries of American Poetry, an anthology compiled by Allen Mandelbaum and Robert Richardson, which attempts to document the canon from the 17th century to 1922, Wallace Stevens is tied with Ralph Waldo Emerson for fourth place in highest page count, with 29 pages of selected poems. Since the anthology's cutoff point ends abruptly at 1922, only Stevens's first book, Harmonium, arguably his most brilliant work, is represented. Even so, the poems in the anthology fail to show Stevens's early variation of theme and style, his wide range of voice and perspective that makes these poems essentially

modern. Thus, this selection of Stevens chosen by Mandelbaum and Richardson is dry and boring, not a unique or even appropriate representation of Stevens's imaginative innovation within the art of poetry. [page 5]

Jatczak, Justin*^ and Frazier, Leah*^ "The Role of Cell Proliferation and Cell Migration in Corneal Endothelial Wound Healing" (Dr. Kenneth Crawford)

Healing of corneal wounds depends on cell proliferation and cell migration. This study explores the effects of a promoter (ET-1) and an inhibitor (5-FU) of cell proliferation on corneal endothelial wound healing *in vitro*. Wound healing in the presence of 5-FU assesses the contribution of cell migration to wound healing. BCEC were isolated from bovine eyes and grown in cell culture. Wound healing was examined in confluent BCEC after mechanical wounding. Cultures treated with 100nM ET-1 and/or 10uM 5-FU, and were photographed at 0, 24, 48 and 72h post-wound. The wound area (um^2) of each culture was determined using image analysis software. Cultures treated with ET-1 heal significantly faster (46%) than controls, whereas those treated with 5-FU healed significantly slower (33%) than controls. ET-1 stimulated wound healing 10.8% in the presence of 5-FU suggesting that ET-1 may enhance cell migration in addition to promoting cell proliferation. [page 8]

Kearns, B. Joe See Stinson, Chasity

Kerr, Brandon Keith "Robot Positioning" (Dr. Stacy Wilson)

In the field of mobile robots positioning and location are essential to the operation of a robot. Two categories that robot positioning can be divided into are relative and absolute positioning. Each category has different challenges and limitations as well as advantages. There is no simple solution to creating a perfect positioning system. Developers often have to combine techniques in order to achieve the required accuracy and performance of a positioning system. This project focuses on researching the different techniques that are available or are being studied. After comparing each method, a system will be created by choosing a method, or a combination of, that seems more viable. This will be demonstrated by showing that it is capable of determining position, orientation, and direction of travel of a device as it moves around a room. [page 8]

Kerr, Brandon See Sangoi, Tejas

Kersey, Niki* "Semantic Effects of the Relationship between Sexuality and Aggression" (Dr. Lance Hahn)

Physiological similarities and sexual assault statistics show a link between sexuality and aggression. We aim to determine whether the relationship between these concepts is reflected in semantic networks in the brain. In order to determine these semantic relationships, a lexical decision task was formed using a list of words rated as highly related to aggression and a list of words rated as highly related to sexuality. If aggression and sexuality are semantically linked, we expect to find significantly shorter reaction times for sexual targets preceded by aggressive primes than for neutral primes, as well as shorter times for aggressive targets preceded by sexual primes than for neutral primes. Preliminary results suggest that aggressive words inhibit priming of sexual targets and suggest a general priming effect by sexual words. [page 5]

King, Stephen*^ See Forshee, James

Koeneman, Molly* "Backstage Housewives in *Barn Burning*" (Dr. Walker Rutledge)

Females in William Faulkner's short story *Barn Burning* fit the traditional role of the time period: backstage housewife. Though the role is standard, the way in which the *Barn Burning* women live in their role is different. Mrs. Snopes – submissive housewife to the contemptible Abner – and Mrs. de Spain – matriarch in her household even over her husband, the Major de Spain – serve as foils for one another as powerless and powerful, victim and victimizer, silent and outspoken. Neither woman is heard nor seen very often, but their influence is perceivable in the actions of their men and the way in which men act under their influence. [page 5]

Kuan, I-Ping "Legend Puppeteer" (Matt Tullis, M.F.A.)

The objective of my research is to create effective visual communication that centers on these puppeteers from different nations and generations. My project will focus on the master puppeteers, Li Tien-lu of Taiwan, Jiri Trnka of the Czech Republic, and Jim Henson of U.S.A. Master Li is one of the most famous Taiwanese hand puppeteers, using the traditional style of performing. Jiri Trnka is known as "the Walt Disney of East." He is internationally recognized as the world's greatest puppet animator. Finally, Jim Henson is one of the most known puppeteers in American history. He adapted ancient art of puppetry to modern television. Puppets confront fears, improvise, and move audiences to new worlds. In order to show the contributions of these puppeteers, I use digital collage to present different culture styles of puppets and technology. [page 12]

Lawrence, Holly Anne "What Would Dumbeldore Do?" (Dr. Ted Hovet)

This work explores the world of J. K. Rowling and her books that have become modern day classics. In my research I studied Albus Dumbledore and compared him with the Holy trinity. Through his benevolence, sacrifice, and guidance he portrays the Father, Son, and Holy Spirit. Through study of the Holy Bible, Christian journals, and the books themselves, one can argue that this character represents something far greater than a humble wizard of children's fiction. [page 5]

Lee, Jiwon "The Great Composers" (Matt Tullis, M.F.A.)

My student research project is to create effective visual communication that informs about three great composers during Classical and Romantic eras. The resulting written report and three digital collages will focus on Beethoven, Mozart, and

Haydn. Their works are still played by many orchestras. Most people recognize Beethoven's "Symphony No. 5," Mozart's Opera "Don Giovanni," and Haydn's "The Seasons." [page 12]

Leftwich, Kristin and Celestian, Aaron "Synthesis and Ion Exchange of Potassium

Our research concentrates on synthesis and ion exchange of nanoporous TsG-1 structure, which poses remarkably high ion selectivity for cesium, even in very low concentrations (~10 parts per million cesium) in concentrated alkaline solutions typical of spent nuclear fuel. Briefly, upon ion exchange the TsG-1 material locks in the cesium into its nanoporous crystalline framework, which in turn distorts, and does not allow the release of the ion back to the environment; thus effectively sequestering cesium from solution. The remaining waste could then be stored using more conventional systems. This talk will detail the structure of the TsG-1 material, ion sequestration and selectivity mechanisms, and future directions for material synthesis. [page 14]

Li, Yan Fen "Synthesis and Structures of Two Novel Organic-Inorganic Hybrid Compounds Containing Polyoxometalates and Ruthenium(II) Complexes" (Dr. Bangbo Yan)

Polyoxometallates (POMs), which are metal oxide cluster anions with discrete structures, have been extensively studied due to their potential applications as catalysts, sorbents, electronic materials, and medicine. The mononuclear ruthenium (II) complex [Ru(bpy)3]2+ (bpy = 2,2'- bipyridyl) is photoactive and capable of proton-coupled electron transfer reactions. We are interested in the synthesis of hybrid materials containing POMs and [Ru(bpy)3]2+ , and to investigate the ability of [Ru(bpy)3]2+ to photosensitize the near-UV absorbing polyoxometallates with the ultimate objective of exploiting their photocatalytic ability on splitting water. Here, we describe two new organic-inorganic hybrid compounds of polyoxometallates. Compound 1, [Ru(bpy)3]2[Mo8O26]•6H2O, was synthesized from the reaction of [Ru(bpy)3]Cl2 with molybdic acid under hydrothermal condition. Compound 2, [Ru(bpy)3][W6O19], was synthesized from the reaction of cis-bis (2,2'-bipyridyl) dichloro-ruthenium (II) hydrate, 2,2'-bipyridyl and sodium metatungstate monohydrate under hydrothermal condition. These compounds have been characterized by elemental analysis, UV-Vis, fluorescence, thermogravimetric analysis and single-crystal X-ray diffraction studies. [page 10]

Liang, Hui-Chen See Emberton, Adam Christopher

Liford, Madison*^ See Delomas, Thomas

Lindsey, Amy "Success of *Silence of the Lambs*: Why We Love Serial Killers" (Dr. Ted Hovet)

Clarice Starling may be the most important part of the success of Jonathan Demme's *Silence of the Lambs* (1991). The film allows its audience to relate to Clarice in various ways and helps us feel as if we are helping her catch the criminals. Movies such as this give us comfort in knowing that in the end there is always a resolution because the "good guys" always win. The film originated as a novel written by Thomas Harris in 1988. People are naturally attracted to serial killers whether they are real or fictional. The film's popularity is also due to the multitudes of serial killer activity during the 1980s and 1990s, and the massive amounts of media coverage given to these killers. I have researched how the film makes us identify with Clarice Starling and how it relates to the media coverage of the serial killers in the 80s and 90s. [page 5]

Lodmell, Matthew See Hamlet, Sean

Logan, Brittany "Operation and Calibration Techniques of a Rigaku X-Ray Diffractometer" (Dr. Doug Harper)

At the Applied Physics Institute, we use a Rigaku X-Ray Diffractometer [XRD] to determine the atomic structure of a given test sample. This instrument was recently paired with a LabVIEW based software application to provide a modern user interface for acquiring and analyzing XRD data. We are presently modifying the LabVIEW applications to include procedures for routine calibration of the XRD to detect any systematic error in the angle at which measurements are taken, and then to correct this error with an appropriate offset. In this presentation, I will speak about the procedures and safety precautions involved in operating the XRD as well as the fundamentals of XRD analysis. The development and progress of the calibration software will also be discussed. [page 7]

Long, Courtney "American Pop Art Artists" (Matt Tullis, M.F.A.)

The focus of my student research project is to create effective visual communication focusing on the works of three American Pop Art artists from the 19th century. I propose to communicate my research by creating three different digital design collages of my three subjects. The three American Pop Art artists I chose to research are Roy Lichtenstein, Jim Dine, and Robert Rauschenberg. I chose Roy Lichtenstein because he was familiar with American Culture and helped develop the Pop Art movement. I chose Jim Dine because he uses traditional painting techniques with a mix of collage, printing, etching, and papermaking. Lastly, I chose Robert Rauschenberg because he used unusual colors and a variety of junkyard objects that he found. [page 12]

Looper, Amy "My Life as Alice" (Dr. Dale Rigsby)

This is an experimental creative non-fiction essay that fuses research with memoir and literature. The paper explores research that details the many negative effects of frequent moving on children. Centering my essay on memories of numerous relocations in my own childhood, I provide real life examples of these adverse effects. In addition to the research element of this paper, I compare my life experiences to that of Alice's as chronicled in Lewis Carroll's popular tale, Alice's Adventures in

Wonderland. I reveal how each move took me further and further down the "rabbit-hole" and how I eventually landed in a "Wonderland of sorts, where I was never the right size, never in control, and nothing ever made sense." While this work showcases my struggles, it also offers hope that children can, like me, ultimately overcome them. [page 5]

Lowery, Gerald See Vanover, Eric Scott

Malone, T. J. "Convective vs. Non-Convective Wind Events: A WRF-Based Comparison" (Dr. Josh Durkee)

High-wind events are frequent and dangerous phenomena responsible for widespread damages, injuries, and casualties across the U.S. each year. These events are commonly associated with severe convective storms (or convective wind events) during the warm season. However, non-convective high-wind events have been shown to produce hazardous outcomes similar in magnitude to hurricanes, particularly during the cool season. This study uses the Weather Research and Forecast model to provide a descriptive comparison between convective and non-convective wind events. Both high-wind classifications occur throughout the year, with the highest frequency of occurrence for convective and non-convective wind events during the warm and cool-season months, respectively. Another important difference is non-convective wind events are typically synoptic in scale (widespread and longer-lived), while convective wind events are more localized with shorter durations. However, both high-wind events are largely associated with the passage of mid-latitude cyclones. Convective wind events commonly occur as pre-frontal events within the warm sector of mid-latitude cyclones, while non-convective wind events occur in the wake of advancing cold fronts. Output data from the model simulations indicate that mid-latitude cyclone dynamics play an important role in the formation of a high frequency of both types of events. [page 10]

Marquardt, Joseph R.* "Molecular Tools for Understanding the Population Genetic Effects of Habitat Restoration" (Dr. Jeffrey Marcus)

Habitat isolation and fragmentation has been found to lead to restrictions in gene flow between fragmented butterfly populations. Much of the fragmentation in south central Kentucky is the result of extensive grazing and other agriculture uses of natural habitats. The Conservation Reserve Enhancement Program (CREP) aims to remedy this problem, among others, by replanting natural vegetation destroyed by grazing and initiating land use changes away from agriculture. Six butterfly species are used; two believed to be directly affected by the seed plantings, two believed to be indirectly affected by land use changes, and two unaffected by the process. The use of a genetic fingerprinting technique known as Randomly Amplified Fingerprints (RAF) was used to study the population structure of these butterflies. [page 14]

Marsh, Danielle Colby; Williams, Heather Rheunna; and Wulff, Andrew "Analysis of Sediments Exposed above the Barren River, Bowling Green, KY" (Dr. Andrew Wulff)

Samples for this analysis were collected from an exposure of layered sediments in Bowling Green, KY. Samples were collected from two areas of the outcrop: the middle and lower clay units, as well as from the Barren River. Characterization of each sample site was done using standard sediment sieves, Malvern Particle Size Analyzer, and XRD analysis. The goal of this research is to determine the flow regime as well as of the source material of the clay particles. Data obtained from a grain size analysis of the Barren River sample revealed that grains were poorly sorted; strongly coarse skewed. The clay-sized particles were further analyzed using the Malvern Particle Size Analyzer to reveal all aspects of the particles on a more defined scale. Standard Operating Procedures were developed for future students in Earth Science studies. [page 7]

Marsh, Danielle Colby See Williams, Heather Rheunna

Matheny, Margaret*^ See Delomas, Thomas

McCann, Sarah "The Influences of Wind Velocity in Hidden River Cave" (Dr. Chris Groves)

Wind in caves can be caused by a number of factors: barometric pressure or temperature differences between the surface and cave, ice chambers below cave rooms, resonance, or wind blowing through the cave. A steady wind in a passageway has been felt in Hidden River Cave and it is hypothesized that meteorological conditions on the surface affect the wind velocity in the cave. Wind velocity readings for the entrance, three rooms and passageways were taken using an anemometer, as well as temperature using an infrared thermometer. Surface weather conditions collected every five minutes and recorded in a data logger were obtained for analysis and later compared with data collected in the cave. Evidence suggests that the temperature differences between the surface and the cave caused the wind, and the barometric pressure influenced it. [page 10]

McCullagh, Bonnie Shae* "'That Horrible Crime Not to Be Named among Christians'" (Dr. Carol Crowe-Carraco)

Sexuality in the Georgian England time period encompasses a variety of homosexual behaviors, and is often controversial due to the varied perceptions that can be drawn. The fodder of political cartoons, letters, and newspapers of the time period provide a vast source of primary material that draws a picture of sexuality. Homosexuality has been conceived as an immoral act since medieval times, but varying degrees of homosexuality have been preserved in British culture. Ranging from mollies to female husbands, homosexuality took an assortment of forms in the time frame of the Hanoverians. The different forms of homosexuality observed exemplify the cultural and societal reactions to homosexuality when the acts were flaunted or hidden from view. [page 15]

McGee, Dorien See Stinson, Chasity

Merriam, Anthony "Control Area Network Communications" (Dr. Michael McIntyre)

We are developing a communications testbed for the Freescale S12 microprocessor that will feature standard RS232 and CAN communications. We are also looking to expand to utilizing a wireless protocol within these lines. We will be able to interface the S12 with multiple peripheral devices for it to control and get feedback. The computer connected to the S12 will send commands and gather data from the processor to compile it in data logs for later review. [page 14]

Metcalfe, Ballard Lee*^ and Antle, Whitney*^ "Average Depths Using Variable Fill Rates" (Dr. Tom Richmond)

The purpose of this project was to investigate average depths of tank shapes with different fill rates. In the investigation, we came across a new way of modeling the problem, using weights, essentially creating a weighted average. We developed some interesting formulae for finding the average depth of shapes based upon the form of an equation y=ax^b. [page 10]

Missik, Justine Emilia*^; Coates, Kati; Bartley, Meridith; and Meier, Albert J. "Eigen-analysis of Microbial Networks Added to Food Webs" (Drs. Albert J. Meier and Bruce Kessler)

Food webs are the best method for depicting prey and predator interactions among species in an ecosystem. Food webs can be depicted in adjacency matrices where 0's represent no direct interaction and 1's represent a direct interaction. The number of indirect pathways of length n within a system is calculated by performing a power series of n on the adjacency matrix of the system. The number of indirect pathways increases with increasing path length. We analyzed the direct pathways of an adjacency matrix and calculated an eigenvalue. We added a bacterial loop to an already existing food web which dramatically increased eigenvalues and pathway proliferation. Pathway proliferation may be one of the great roles of bacteria in ecosystems. [page 10]

Mitchell, Holly Ruth*^ "Use of a Gamma Ray Scintillometer to Aid Stratigraphic Correlation of Mississippian and Pennsylvanian Rocks in South-Central Kentucky" (Dr. Michael May)

The Shanty Hollow area in northeastern Warren County has been characterized before, but never with a gamma ray scintillometer on the outcrop. With the gamma ray scintillometer, a measurement of the radioactivity of sedimentary rocks above and below a major unconformity or sequence boundary was able to be obtained. The gamma ray plot generated at Shanty Hollow was correlated to a gamma ray profile constructed for strata located along HWY 185, near the Green River. Upon inspection, I found that what was believed to be Waltersburg Sandstone from the Mississippian Period is most probably Caseyville Sandstone from the Pennsylvanian Period. The data collected adds to the state geological record and allows for informed drilling for unconventional resources – such as tar sands, asphalts, and heavy oil – associated with the sequence boundary. [page 8]

Morgan, Rebecca*^ See Delomas, Thomas

Morrison, Travis See Berry, James Alex

Mulholland, Natosha See Rucks, Melinda

Oakes, Landon* and Dobrokhotov, Vladimir "Nanostructures in Electronic Nose Technology" (Drs. Vladimir Dobrokhotov and Alexander Barzilov)

An electronic nose is a biologically inspired device that identifies and analyses chemical compounds in gaseous environments. Electronic nose technology has many potential uses in the food industry where it could help maximize product quality and reduce production costs. An electronic nose consists of a mechanism for chemical detection, such as an array of electronic sensors, and a mechanism for pattern recognition, such as a neural network. Currently research is focused on making the devices smaller, less expensive, and more sensitive. It became possible thanks to the application of nanostructures in electronic nose technology. In this presentation we discuss the possibilities of sufficient improvement of sensitivity and selectivity of electronic noses using novel nanomaterials. [page 4]

Odobasic, Lada Kloi "Gaining Access in Congress" (Dr. James Chappell)

It is unknown to our public how interest groups gain access in Congress. To better understand the process and clear misconceptions, this work will analyze the process of gaining access according to the literature of Henson "Gaining Access: Congress and the Farm Lobby." The focus is on four important factors: competitive advantage, cost-efficiency, effectiveness and recurrence. The results show that without consistent growth of competitive advantage based on numerous factors, without cost efficient and effective service, and a topic that re-occurs on the agenda, interest groups cannot gain access in Congress. [page 5]

Olberding, Jordan*; King, Rodney; and Rinehart, Claire "Mycobacteriophage Luci Isolated from WKU Soil" (Drs. Rodney King and Claire Rinehart)

Bacteriophage (phage) are viruses that infect bacterial hosts. They are extremely abundant, yet most are unclassified. Phage use bacteria to replicate, and then lyse the host cell to release the newly-assembled viruses. The goal of the experiments conducted in the Genome Discovery and Exploration program was to add to the scientific community's database of characterized phage. A novel phage was isolated from a soil sample taken from Western's campus. Mycobacteriophages were detected in the soil sample, by growing them on the host bacterium, *Mycobacterium smegmatis*. After incubation, plaques (clear areas in the bacterial lawn where lysis has occurred) were visible. From the many plaque morphologies observed on the plates, a single plaque type was chosen. The phage from the plaque were purified extensively. The genomic DNA of the newly isolated phage

(named Luci) was extracted and analyzed. The results of the DNA analysis suggest that Luci is a unique mycobacteriophage. [page 10]

Osburn, Kaitlen M.* "Ambiguity and Its Reward in Hawthorne's Tales" (Dr. Sandra Hughes)

Studying Nathaniel Hawthorne's works often means being subjected to short stories filled with ambiguous characters, plots, endings, and themes. Hawthorne makes use of moral, linguistic, and symbolic ambiguity in many of his most well known works, such as *Roger Malvin's Burial*, *Young Goodman Brown*, and *Rappaccini's Daughter*. Hawthorne's works prove difficult to wade through on their own, but in these particular tales the prevalence of ambiguity creates wide differences in interpretation; however, dissecting the effect of ambiguity on the outcome of these stories proves to be most rewarding. This paper explores the role of ambiguity in Hawthorne's works and how its use ultimately makes the reader search harder for an explanation in some of Hawthorne's tales. [page 5]

Osburn, Kaitlen M.* "Milton's Trinity" (Dr. Lloyd Davies)

Humans have struggled with the concept of Evil since the beginning of existence. According to Christian doctrine, this event was known as "The Fall." In the essay *Areopagitica* and the epic poem *Paradise Lost*, John Milton discusses the creation of Evil, its purpose in the world, and the co-existing natures of Good and Evil in order to justify God's primordial judgments. Milton's explanation correlates closely with his theory of free will, and soon, it becomes clear that Milton's theology is founded on a trinity of Good, Evil, and Freedom. [page 5]

Pan, Alice See Vanover, Eric Scott

Parke, Tyler*^ See Delomas, Thomas

Patel, Khushbu; Philips, Keith; Fields, Ashton; and Bell, Karen "Molecular Phylogenetic Analysis of Bostrichoidea (Insecta: Coleoptera)" (Dr. Keith Philips)

The Bostrichoidea is a diverse group of beetles, found throughout the world. The superfamily includes the families Bostrichidae (horned powder-post beetles), Dermestidae (carpet beetles and skin beetles), Anobiidae (death-watch beetles)and Ptinidae (spider beetles). The group is varied in its ecology, with the ancestral condition possibly wood-boring, but with derived species living in fungi, dung, accumulated organic matter, and as inquilines in the nests of mammals and ants. To determine the phylogenetic relationships within the Bostrichoidea, DNA sequences were obtained from the mitochondrial genes cytochrome oxidase I (COI) and large subunit rRNA (16S), and the D2 loop of the nuclear 28S gene. Phylogenies will be presented and will include a discussion on the monophyly of the families and subfamilies within the Bostrichoidea. [page 14]

Pease, April; Strolger, Louis-Gregory; Wolff, Schuyler*; and Gott, A. M. "The Sersic Morphologies of Thermonuclear Supernovae Host Galaxies in the Nearby Galaxies Supernova Search Data" (Dr. Louis-Gregory Strolger)

The Nearby Galaxies Supernova Search (NGSS) Project intended to find nearby supernovae in order to measure the rate of supernovae in nearby galaxies, and map out the diversity of galactic environments. Our current goal is to constrain the ages (partly constrained by morphological types) and metallicities of galaxies that hosted type Ia supernovae during the survey, to better understand the progenitor mechanisms for these supernovae. I will present the morphology measures of the host galaxies using a program, GALFIT, to quantify the light profiles using Sérsic indices. I will compare these to galaxies that did not host supernovae to find a correlation in supernova rates and galaxy properties. Our results should improve the understanding of initial conditions for rates of type Ia supernovae in galaxies in the local universe. [page 14]

Perkins, Mackenzie C.; King, Rodney; and Rinehart, Claire "Isolation and Characterization of Wizard007, a Novel Bacteriophage" (Drs. Rodney King and Claire Rinehart)

The purpose of my research was to isolate a novel bacteriophage from an environmental sample collected from Hopkinsville, Kentucky. Our search was restricted to viruses that specifically infect mycobacterium species. This was accomplished through an enrichment procedure using *Mycobacterium smegmatis* as the bacterial host. After several rounds of purification, the morphological characteristics of the mycobacteriophage (designated Wizard007) were determined by electron microscopy. Viral genomic DNA was isolated from the Wizard007 particles. The purified DNA was assessed for quality, quantity and size by DNA restriction analysis and gel electrophoresis. The sequence of the Wizard007 genome has been determined. Students in the Genome Discovery and Exploration class will annotate the genome by identifying all the viral genes using the tools of bioinformatics. [page 10]

Perry, Cathy "Traditional Media, Contemporary Art" (David Marquez, M.F.A.)

Bronze casting sculptures using natural materials such as twigs, flowers, seed pods, and vines is the focus of my research. Using these small, delicate, and sometimes brittle items are especially difficult to cast. I cast this material in the time-honored and traditional Lost Wax Method. This involves waxing the plant material and then wax welding them together into the basic form. After gating the form by adding a pour spout, the wax form is then placed into a plaster mold. The material is then burned out in a kiln. In place of the form is a negative space which is filled with molten bronze. The bronze is then broken out of the mold. Removing the gating with a grinder, the bronze is now ready for a patina. Bronze is a traditional material that I use for contemporary art. Experimenting with the material is a great way to expand my work. [page 12]

Petruska, Natalie "The Chronicles of Arsenic" (Dr. Kenneth Kuehn)

Arsenic is a very mysterious and dangerous substance. It comes from the natural environment and is found on the periodic table as element 33 and the chemical symbol is As. It is classified as a metalloid meaning that is has the appearance and some properties of metal. Arsenic is found in trace amounts in rocks, animals, water, soils and plants – virtually everywhere. Arsenic can also be found in wood preservatives, dyes, drugs, soaps, semiconductors, herbicides and poisons. Arsenic naturally occurs in the earth's soil and be distributed by air and water. Chemical plants such as coal and power plants help to create such a dangerous chemical to get into the air and water. There are many ways we can handle this issue and do this by going to state representatives and showing them how much of an issue this is. We can also get with other Universities to do studies, show the public evidence, and write letters to the Government to prove to them that is has to be dealt with. [page 14]

Pritchett, Leah Dale* "The Notion of False Equality" (Dr. Patricia Minter)

In this paper, I argue that decisions of the court that allege to promote equality do not uphold their promise. This paper will illustrate that many paramount court cases in American legal history have failed to liberate minority groups and on some occasions have hindered equality. I will use cases such as "The Slaughterhouse Cases," "Civil Rights Cases of 1883," "Plessy v. Ferguson," and "Ritchie v. People" to illustrate that when a decision of the court claims to promote equality, it is not always fact. [page 15]

Pullen, Gregory See Fulling, Randy Matthew

Quintero, Reyes See Hall, Jason

Racke, Danielle M. See Wigginton, Sara K.

Rader, Shelby True* "Characterization of Porous Titanium Silicates" (Dr. Aaron Celestian)

Crystalline silicotitanates (CST) are porous zeolitic structures which are naturally very ion selective materials. These structures have the potential to safely store hazardous chemical byproducts and are widely used as ion-exchangers and gas sieves for separation technologies. Several silicotitanates were synthesized in our lab. The structure and chemical composition of these were determined by using a combination of Raman spectroscopy and X-ray diffraction (XRD), revealing the complex mechanisms which control the ion selectivity in these materials. [page 10]

Rivera, Roberto Apollo Theodore "The Godfathers of Anime" (Matt Tullis, M.F.A.)

In my display of the Visual Research Series, I will make poster presentations of three legendary creators of anime. Anime is a genre of art that has its origins in Japan and worked its way into the west from 60s, 70s, and 80s during the Pop Art movement. Osamu Tezuka, Yoshiyuki Tomino, Katsuhiro Otomo are THE three originators whose works gave birth to a generation of artists trying to mimic their images. I will make three different posters showing their famous works that are recognized as classic art forms from the Pop Art movement, graphic novels, and the monumental visuals that made them legends. [page 12]

Robinson, Sara and Wilson, Amanda "New Ways of Learning" (Dr. Sheila Flener)

Color plays an important role in a physical learning environment. It is also a major element in interior design that impacts student's achievement as well as teacher effectiveness and staff efficiency. Color recommendations for a library differ for each area, as they are used for separate purposes. In this space, a feeling of openness is achieved not by adding structural walls, but by creating different areas for specific functions. These areas are designated by color and furnishings of the different spaces. A color scheme including earth tones with pops of bright colors allow the user to feel focused, but also be stimulated at the same time. The furnishings of the space are what give it its modern feel. They are not only sleek and stylish, but comfortable as well. [page 11]

Roe, Maggie Lian* "Adapting to Aging in Place: An Assessment of Residential Living Facility Residents' Physical Activity Program Expectations" (Dr. Dana Burr Bradley)

Village Manor is an independent retirement community in Kentucky. When the community was built in 1995, designers did not anticipate residents' long term physical activity needs. To meet the needs of current and future residents, resident's physical activity levels and their expectations were examined. The PASE survey was administered to develop a profile of current physical activity. One focus group was held to develop themes relating to residents' current desires. Results showed that compared to the theoretical recommendations for this age group, resident's current activity levels were less. Their desires for specific physical activity programs were not being met. This presentation concludes with recommendations for fitness area enhancement to increase the likelihood of residents meeting proposed physical activity levels. [page 11]

Roe, Maggie Lian* "A Student's Perspective: Using Mixed Research Methods with a Frail Population" (Dr. Dana Burr Bradley)

Formal course work in gerontology and research methods provides a strong foundation for conducting research with older adults. However, only through hands on experience can a student fully appreciate the challenges of working with this population. This presentation briefly describes the methodologies employed and focuses on what actually occurred during a CE/T focus group session. Issues such as physical environment, quality of the partnership between WKU and the residential facility and health status of the older adults were important to consider. The presentation concludes with suggestions for both students and faculty advisors to insure a fruitful research experience for both the older adults and the researchers. [page 15]

Rogers, Kallie "*Fish Are Jumping*" (Dr. Heidi Pintner)

Robert Dick's composition *Fish Are Jumping* is a solo flute work written in the form and style of the blues. This piece is a valuable addition to the flute repertoire. It contains several extended, or nontraditional, techniques such as glissandi, multiphonics, natural harmonics, and singing and playing. While expanding and enriching the flutist's tone and technique, the composer also denounces any stereotypes that the flute is not a suitable jazz/blues instrument with this fun and challenging work. [page 5]

Rogers, Edward Thomas* "Concepts of Self: Science and Buddhism" (Dr. Eric Bain-Selbo)

Owen Flanagan's *The Problem of the Soul: Two Visions of Mind and How to Reconcile Them* establishes a strong argument for the existence of a philosophical harmony between the scientific and Buddhist concepts of the self; however, theories in astrophysics that consider the possibility of a 4th dimension appear to challenge the idea that such a harmony can exist. The objective of my presentation is to discuss why such scientific theories challenge Flanagan's argument by first discussing the Buddhist view of the self, then demonstrating how the nature of a 4th dimension would distort it. After discussing these fundamentals, I will demonstrate the validity of Flanagan's argument and explain how he manages to parallel the scientific and Buddhist views of the self. To explain how the concept of self would change in the 4th dimension, I will show a video clip of a lecture given by Carl Sagan, in which he explains the 4th dimension as a theoretical view. I conclude that if future sciences are to consider the 4th dimension as a property of reality, then the concepts of self in science and Buddhism will be drastically opposed to one another. Since my argument is based on theories that are not yet proven, and possibly will never be, one should interpret my argument as a theoretical and conjectural attempt to approach the notion that science and Buddhism parallel one another with skepticism. [page 8]

Rucks, Melinda; Webb, Cathleen; and Mulholland, Natosha "Bio-accumulation of Mercury (Hg) in Bat Hair from Atmospheric Deposition" (Dr. Cathleen Webb)

Mercury (Hg) is a persistent neurotoxin that is easily transported through karst aquifer systems. The largest source of Mercury is atmospheric deposition, largely produced by coal-fired power plants. Over 350 individual bat hair samples have been analyzed for Hg with a wide variety in species diversity. Our project has expanded to three more national parks in the Kentucky and Tennessee area. Hg levels in the hair of different bat species, including federally listed endangered species, have been determined and found to range between 1-13 ppm. In addition to bat hair, several bat guano samples have been analyzed for Hg and found to range from 0.0030 ppm to 0.9470 ppm. Further analysis has been performed on insects to gain additional information regarding how bats bio-accumulate Hg through the food chain. Sediment samples have also been analyzed for Mercury. Quality analysis and quality control tests were done using human hair reference standards. [page 10]

Sales, Trevor Alan "Classic Comedy" (Matt Tullis, M.F.A.)

The objective of my student research paper is to effect a visual communication that centers on classical slapstick. My subjects are Charles Chaplin, Abbot and Costello, and the Three Stooges. These comedians shaped the development of modern comedy and enriched the lives of millions with their humorous antics. I propose to communicate my findings in the form of digital collage and a written paper. [page 12]

Sangoi, Tejas*^ and Kerr, Brandon*^ "Using GIS to map the Lost River Cave System" (Pat Kambesis, M.S. and Kevin Cary, M.S.)

The Lost River Cave System is an important feature of the karst landscape on which Bowling Green, Kentucky is developed. Because karst is vulnerable to human impact, georeferenced cave maps are important to help identify sources of water pollution and other impacts. This team project focuses on georeferencing the Lost River Cave System and associated features. GPS coordinates of cave entrances, sinkholes, springs, karst windows, and other karst features is being mapped against a physical map of the area using GIS. Standard cave survey techniques is being used to define size, shape, and location of conduits. Once data is collected, the information will be organized using GIS to georeference the data and organize photos and field descriptions. The Lost River GIS can function as a tool for land management and development decision-making. [page 10]

Santodonato, Louis See Campbell, Nathan

Sawyers, Spenser* "Black-hearted Bastards: Sylvia Plath's Holocaust Imagery in *Daddy* and its Significance" (Dr. Ted Hovet)

Sylvia Plath's 1965 poem *Daddy* is the author's most notorious and controversial poem, due to the author's metaphorical use of the Holocaust. Plath's, as well as the speaker's, relationship with her father and her own German heritage create an intricate and precarious relationship with the poem's Holocaust imagery and language. The speaker pits herself against her dead father by labeling herself as a Jew, and dubbing her father a demonic "man in black with a Meinkampf look," to be able to finally mourn her father's untimely death. Plath struggled to balance life as a mother, wife, and writer, expressed in the frustration with the male figures throughout the poem. After studying *Daddy* via biographical, psychological, and feminist literary approaches, it emerges as a complex, fascinating poem, rich in its multi-contextual meaning. [page 5]

Scaff, Tyler*^; King, Rodney; and Rinehart, Claire "The Phage and I" (Drs. Rodney King and Claire Rinehart)

The Genome Discovery and Exploration class was composed of 20 novice scientists who were challenged to isolate and characterize novel bacteriophages from the environment. Our goal was to isolate phages that specifically infect *Mycobacterium smegmatis*, a common soil bacterium. Each student purified their phage to homogeneity and assigned a name to their discovery. I named my phage Hortensius Cato 9. High titer lysates were prepared and the phage particles in these lysates

were examined by electron microscopy to determine their morphological characteristics. Phage Genomic DNA was isolated and the amount of DNA recovered was determined spectrophotometrically. The DNA was analyzed by using restriction enzymes to cut the DNA and the resulting fragments were analyzed by gel electrophoresis. The DNA sequence of two bacteriophages isolated in the class will be determined. We will annotate the genomes of these phages by identifying all the viral genes using the tools of bioinformatics. [page 10]

Schrader, Sarah*^; King, Rodney; and Rinehart, Claire "TiroTheta9, a Novel Mycobacteriophage Isolated from the Soil" (Drs. Rodney King and Claire Rinehart)

Bacteriophages are the most abundant organisms on earth, and yet very few types have been characterized. The objective of this experiment was to isolate and characterize a novel bacteriophage from the environment. *Mycobacterium smegmatis*, a harmless bacterium commonly found in soil, served as the host and facilitated the enrichment and recovery of mycobacteriophages. The presence of phage was confirmed by the appearance of clear, circular plaques on a lawn of bacteria. A single phage type was purified to homogeneity and was designated TiroTheta9. The purified TiroTheta9 phage particles were visualized by electron microscopy. TiroTheta9 genomic DNA was isolated and analyzed using a spectrophotometer, DNA restriction enzymes and gel electrophoresis. Based on this data, we conclude that TiroThet9 is a unique mycobacteriophage. These experiments were conducted over the course of a semester in the Genome Discovery and Exploration class. [page 10]

Schulte, Kathleen* "A Speech-Language Pathologist Perspective on the Referral and Assessment of Bilingual Children Whose Primary Language is not English" (Leisa Hutchison, M.S.)

This study presents the results from a survey issued to speech-language pathologists in the state of Kentucky regarding their perspectives on referral and assessment of bilingual speakers whose primary language is not English. The study was conducted to determine methods for decreasing the over-identification of bilingual students served for speech and language disorders. [page 11]

Scott, Julie S. and Kintzel, Edward "Investigation of P-Sexiphenyl Layers Vapor Deposited onto KCl (001) by Atomic Force Microscopy (AFM) " (Dr. Edward Kintzel)

We have investigated the structural properties of the aromatic molecule p-sexiphenyl (p-6P) vapor deposited onto KCl (001) substrates. Individual substrates were maintained in the temperature range 50-200 Â°C during growth of these ultra-thin films. In a series of AFM studies the microstructure evolution of the adsorbed films can be observed as a function of substrate temperature during deposition. Included in our observations are needle-like structures and platelets of p-sexiphenyl that can be related to the substrate temperature during deposition. The needles are approximately aligned along the [110] direction of the KCl (001) surface. The results are reproducible and suggest that ultrathin films of p-6P molecules can be grown with desired molecular orientations by carefully selecting the appropriate substrate temperature during deposition. [page 10]

Seng, William See Fulling, Randy Matthew

Sharpensteen, David Allen "Influential 20th Century Directors" (Matt Tullis, M.F.A.)

The goal of my student research project is to create and visually communicate the overall theme surrounding influential 20th century cinema directors. The resulting written report and digital collages will express the important contributions to the growth and evolution of storytelling, and visual based media in the modern film industry by Alfred Hitchcock, Stanley Kubrick, and Akira Kurosawa. [page 12]

Sholar, Rachel "Joan Didion and *The Year of Magical Thinking*: A Mastermind of the Grief Account" (Dr. Ted Hovet)

The objective of my student research project is to reveal how Joan Didion's memoir, *The Year of Magical Thinking*, is a superb example of the "grief account," and should not be lassoed into the self-help genre. Nevertheless, one might find Didion's prose shelved in the "self-improvement" section at bookstores. Didion's memoir chronicles her bereavement process after the death of her husband, John Gregory Dunne. Yet make no mistake, *The Year of Magical Thinking* is not another 12-step program. Didion's memoir will be examined as a "grief account," more specifically, death explored through memoir (Dennis 802). This study will use research into the self-improvement, memoir, and grief account genres to illustrate how Didion's work differs from self-improvement literature. Didion's prose is a profound literary machine; we must treat it as such. [page 5]

Simouth, Christopher James* and Binion, Jenna "Flourescein Functionalized Silsesquioxane Nanoparticles: Synthesis, Characterization and Morphology" (Dr. Hemali Rathnayake)

Stable flourescein functionalized nanoparticles were prepared by base catalyzed hydrolysis of flourescein carboxylic acid functionalized silane precursor in the presence of catalytic amount of tetraethoxysilane (TEOS). Particle size and dispersity were controlled by adjusting the molar ratios of ammonium hydroxide and TEOS concentration. The size, shape and surface morphology of these functionalized particles were visualized using transmission electron microscopy, and characterized by elemental analyses, and FT-IR spectroscopy. We were able to optimize the reaction conditions to prepare smaller size nanoparticles in sizes ranging from 20 nm to 80 nm in size. These fluorescent nanoparticles are highly advantageous due to the significant load of covalently attached dye and high solubility in a wide range of solvents and medium. [page 10]

Simpson, Mike See Berry, James Alex

Simpson, William "Particularism and Defining Morality" (Dr. Michael Seidler)

Moral particularism is a view of moral philosophy, which claims that moral actions are necessarily context sensitive and cannot be wholly explained by any moral theory or set of abstract general moral principles. In this paper I explore the problems with the assumptions of generalist moral theories and discuss the perceived problem of defining morality within a particularist framework. [page 8]

Sizemore, Mechelle "Social Interaction and the Development of Identity" (David Marquez, M.F.A. and Dr. Brent Oglesbee)

Social Interaction and the Development of Identity Social Interaction and the Development of Identity is a sculptural and video installation designed to ask viewers how they have been influenced by and how they have influenced their social environment. The installation was constructed in a 20' x 20' square room. A video displaying a series of overlapping interview excerpts was projected on one wall along which were lined 8 life-sized, hollow figures made with masking tape. The remaining walls were covered by questionnaire responses addressing the same theme as the video. Through the repetition of theme and overlap of information, the installation illustrates that all of us have equal or similar concerns and experiences, regardless of their diverse backgrounds. [page 8]

Smelser, Amanda Marlene and Yan, Bangbo "A New Hybrid Organic–Inorganic Porphyrin–Polyoxometalate Compound" (Dr. Bangbo Yan)

A porphyrin molecule in chlorophyll is responsible for absorbing visible light during photosynthesis. The benefits of using metalloporphyrins as building blocks for synthesis of supramolecules are their photochemical excitations and rich redox chemistry. On the other hand, polyoxometalates have been shown to act as photocatalysts for water splitting. Our hope is that once successful binding of these molecules is achieved, excited electrons from porphyrin molecules will transfer to polyoxometalates and catalyze the reduction of water to produce hydrogen. Using a molecular building block approach, we have synthesized a new compound containing a metalloporphyrin complex and a polyoxotungstate cluster unit. [page 4]

Smith, Chelsey Danielle "The Effect of a Three Point Sensory Diet on Vocal and Verbal Behavior in a Non-Verbal Child on the Autism Spectrum" (Mary Lloyd Moore, M.S.)

The study involved a single subject, non-verbal child on the autism spectrum, in a clinical setting over a 20 week period. The subject was on a sensory diet, administered before therapy sessions. The tactile, vestibular and proprioceptive systems were targeted with deep pressure touch, a suspension swing, and joint compression. The primary focus was on language development with specific attention to the enhancement of vocalizations/verbalizations. The child experienced the sensory diet for schedule of 1 week off, 2 weeks on, 1 week off, 2 weeks on, 1 week off and 1 week on for the first 8 weeks. A student speech-language pathologist is planed, directed and worked with the client for one hour twice a week for ten weeks. A researcher observed to document data and oversee progress to relay the efficacy of the three point sensory diet. [page 6]

Smith, Hunter*^ See Walter, Anna

Sowell, Dewayne Emmanual "Cost Effective Robotic Solutions for Military and Law Enforcement" (Drs. Phillip Womble and Alexander Barzilov)

Wireless Action and Surveillance Platform (WASP) Abstract for WKU Student Research Conference Talk is devoted to design, construction and possible commercialization of an economical robotic platform directed at both military and state explosive disposal units for surveillance and action to neutralize improvised explosive ordinance. As units with similar functionality are already on the market, emphasis was placed on the attention to the cost-effective approach. The design, construction and testing of the platform will be discussed. A quick overview of additional equipment and software developed in conjunction with the robot for its further ease-of-use will also be given in the context of their more generalized application. [page 4]

Steele, Michael "Fathers of Art Nouveau" (Matt Tullis, M.F.A.)

The goal for my student research project is to create an effective visual communication centered on the theme of Art Nouveau. My digital and written portions of this project will highlight three key figures in the Art Nouveau Movement: Alphonse Mucha, Jules Cheret, and Theophile Steinlen. I will communicate this information through the visual form of digital collage. [page 12]

Stewart, Patrick Christopher* and Smith, Michael E. "Gas-filled Paired Swimbladders: GPS for Sound Localization in Loricariid Catfishes" (Dr. Michael E. Smith)

Catfishes of the family Loricariidae have bi-lobed swim bladders that are adjacent to their ears. We hypothesize this anatomical design assists these fishes in sound localization. Previous experiments demonstrated that the loricariid catfish *Otocinclus affinis* could be trained via operant conditioning to approach a speaker producing conspecific sounds. Twenty-six trained fish were used to test the acuity of this sound localization by randomizing a conspecific sound-stimulus through four speakers mounted along the edge of a round tank and videotaping fish behavior. Fish were acclimated for five min., exposed to the sound for five min., and then recorded for another five min. At the beginning of each trial, 19 out of 26 fish (73%) swam to the correct sound-producing speaker first. Fish spent significantly more time near the sound-producing speaker than the other three speakers. These experiments demonstrated that *O. affinis* can localize sound. Twenty-four trained fish were then used to test whether swim bladder deflation would affect sound localization. To test this we used the same setup and recorded the behavior of fourteen un-deflated (control) fish which resulted in 100% accuracy for localizing the correct speaker. We then deflated the swim

bladders of the remaining ten fish, and 0% of the fish went to the correct speaker. In conclusion, swim bladders do play a role in sound localization of *O. affinis*, and once deflated, they have difficulty in localizing a conspecific sound. Future experiments will further study the sound localization acuity of *O. affinis*. [page 7]

Stinson, Chasity; Florea, Lee J.; Fowler, Rick; Brewer, Joshua; McGee, Dorien; Kearns, B. Joe; and Greco, Anthony M. "Biofilms and Calcite Precipitation within a Cave in the Upper Floridian Aquifer, Citrus County, Florida" (Dr. Lee J. Florea)

We present an example of biofilms from Thornton's Cave in west-central Florida. Some biofilms have crystalline overgrowths. PCR and electrophoresis identify the films as the iron-oxidizing bacteria *Leptothrix spp*. SEM images of the biofilms reveal a mat of hollow tubes. Other SEM images illustrate that these tubes may be overlain by and intercalated with rhomboidal crystals. EDS and XRD establish the mineralogy of the tube sheaths and the crystal overgrowth as FeOx and CaCO3, respectively. A calcite tablet exposed directly to the cave water and a second encased in a chamber with a filter were left in the cave for nearly five months during the winter of 2007-08. Neither sample lost mass during the experiment, nor were etchings or borings detected in the sample exposed to microbial activity. [page 11]

Strain, Jacob Michael "Study of 4-vinylphenol Reductase" (Dr. Kinchel Doerner)

Malodorants have recently become a problem near commercial swine farms with some malodorants being detected up to sixteen kilometers down wind from the facility. One of these malodorants is 4-ethylphenol. Recently the laboratory has isolated Lactobacillus sp. pep8 that is capable of converting para-coumaric acid to 4-ethylphenol. The conversion is a two-step process. First para-coumaric acid is decarboxylated to 4-vinylphenol and then reduced to 4-ethyl phenol by the action of 4-vinylphenol reductase. Para-coumaric acid decarboxylase is a well-studied enzyme however 4-vinylphenol reductase has yet to be identified. Lactobacillus sp. pep-8 was grown in MRS media with para-coumaric acid (1 mM). The generation of 4-ethylphenol will be determined by the change in absorbance at 350 nm by UV spectroscopy for NADH/NADPH (0.5 mM) cofactor. [page 7]

Strand, Rebecca Rose "Great Female American Poets" (Matt Tullis, M.F.A.)

The objective of my student research project is to create effective visual communication that centers around female American poets. The resulting written report and digital collages will be based on the following three poets: Sylvia Plath, Dorothy Parker and Anne Sexton. All of these women were very successful despite having mental issues dealing with suicide. Although Plath and Sexton's work were more focused on the problems in their lives, Parker was also known for her wit. [page 12]

Thaman, Michael Blaine "Zombie Pioneers" (Matt Tullis, M.F.A.)

My objective with the student research project is to create effective visual communication that centers on the overall theme of the zombie phenomenon. The resulting written report and digital collages will be based on the following information. Zombies have become a noteworthy part of pop culture. I plan to visually communicate this theme using three leaders in zombie entertainment. I will present George A. Romero, Max Brooks, and Shinji Mikami. Romero is a well-established filmmaker responsible for *Night of the Living Dead*. Brooks is a new but very popular novelist who has written *The Zombie Survival Guide*. Shinji Mikami is the founder of the prolific *Resident Evil* video game franchise. [page 12]

Tope, Cynthia*^; King, Rodney; and Rinehart, Claire "Agkelos, an Angelic Phage on Earth" (Drs. Rodney King and Claire Rinehart)

Through the WKU Biology Department's Genome Discovery and Exploration Program, I was able to isolate a unique mycobacteriophage from a soil sample. Bacteriophage are viruses that use a specific bacterium as a host to generate new phage particles. The bacterial host used in the class, *Mycobacterium smegmatis*, is a common inhabitant of soil. Through a series of experiments, I was able to purify a single phage type. The newly discovered phage was named Agkelos, which means "angel" in Greek. This name was chosen because the plaques formed by the phage had a faint halo around a turbid center. After harvesting large numbers of Agkelos phage particles, I was able to characterize the morphology of the phage using an electron microscope. The genomic DNA from Agkelos was extracted and analyzed by spectrophotometry, DNA restriction enzymes, and gel electrophoresis. These results showed that Agkelos was different from the phages discovered by other students in the Genome Discovery and Exploration class. [page 11]

Torres, Ryan Edwards; Durkee, Joshua; and Mahmood, Rezaul "Urbanization and Its Impacts on Precipitation around Three Urban Centers in the Kentucky-Ohio River Valley" (Dr. Rezaul Mahmood)

It is well known that urbanization produces urban heat island (UHI) effect which resulted in higher air temperatures compared to outlying rural areas. This effect has the potential to alter convection and enhance precipitation in areas downwind of large cities. This is due primarily to urban and industrial development. This study was conducted to measure the degree of enhancement of precipitation in 3 cities: Evansville, Indiana; Louisville, Kentucky; and Cincinnati, Ohio. The scope of this research was from the months of June to August during the years of 1998-2009. Tropical Rainfall Measurement Data (TRMM) was used to provide time-series sensitive anomaly products that displayed evidence of possible enhancement of precipitation in and around these three urban areas. Initial results indicate potential modification of localized precipitation regime during the years of 1998, 2001, 2005, and 2006. We conclude that further investigation is needed to better understand these outcomes. [page 11]

Tran, Mai Nhat "Multinational Corporations and the Development of Modern Trade and Retail Business in Vietnam" (Dr. Ian Lee)

This paper looks at what causes retail market to modernize in Vietnam and the path that the market takes as modern trade evolves. The paper investigates the shift from traditional trade to modern trade in Vietnam. The less developed markets of some South East Countries including Vietnam have become attractive to multinational companies. There has been an increasing expansion of multinationals in Vietnam. This paper investigates and the movement from traditional trade to modern trade in Vietnam. Although modern trade still captures a small portion of trade in Vietnam, there is an increasing growth in the demand for this new kind of trade. The paper also looks at the multinationals involving in modern trade and retail business in Vietnam. Study shows that localization plays an important role in the success of current leaders. [page 6]

Turner, Camille*^ See Batra, Sumit in Graduate Abstracts

Tyler, Joey Thomas "The Back Bowl" (Matt Tullis, M.F.A.)

My student research project objective is to visually communicate the overall theme of snow skiing and three of its disciplines. The first discipline is alpine skiing, which is essentially downhill skiing on a groomed slope, but can include slalom and giant slalom. The second discipline is cross country snow skiing, or Nordic skiing. The last discipline is freestyle/freeride, which is a combination of using a terrain park and the actual mountain for jumps and tricks. I propose to communicate my research with through the visual communications of digital collage art and a written paper. [page 12]

Van Meveren, Mayme M. "Effect of Radiation Sources Distribution on the Effectiveness of Brachytherapy Treatment" (Drs. Ivan Novikov and Alexander Barzilov)

Interstitial brachytherapy is a form of cancer treatment using radioactive sources that are implanted directly into cancerous tissue. A special case of interest in interstitial brachytherapy for the treatment of prostate cancer is the sensitivity of the cancerous prostate cells to radiation compared to that of healthy prostate cells, which are more likely to be affected by the radiation than the cancerous tissue. We studied the effectiveness of radiation treatment as a function of the size of radiation sources and their distribution in a treated volume. The dose distribution was calculated using Monte Carlo Neutron Propagation simulation software (MCNP5). The effectiveness of the dose distribution was estimated from published survival models for healthy and cancerous tissues. In the presented work, we are discussing the obtained results. [page 11]

Vanover, Eric Scott; Pan, Alice; Lowery, Gerald; and Zhang, Rui "Production of Highly Reactive Metal-Oxo Species with Molecular Oxygen and Light for the Selective Oxidation Catalysis" (Dr. Rui Zhang)

The goal of this research is to develop selective oxidation catalysis via highly reactive metal-oxo species. The proposed catalytic sequence involves the following: 1) photo-disproportionation of the μ-oxo metal(IV) dimers to give metal(III) and metal(V)-oxo oxidizing species; 2) substrate oxidation by resulting metal(V)-oxo species to give oxidized products and a second metal(III) species; 3) oxidation of metal(III) complexes by O2 to regenerate μ-oxo metal(IV) dimer. The catalytic sequence is inexpensive, using only molecular oxygen from the atmosphere and visible light. It is also very "green" because there are no by-products for the catalytic sequence. The target transient oxidant for the photo-catalytic procedure is the ruthenium(V)-oxo or iron(V)-oxo species that are highly reactive oxidant for a wide range of oxidations. [page 11]

Vaught, Kasey "Disney's *The Little Mermaid*: The Pursuit of Patriarchy" (Dr. Alison Ganze)

Classic Disney films represent childhood and innocence for many Americans; however, Disney's films also offer commentary on contemporary American society. Typically, Disney films are animated adaptations of classic fairy tales. Hans Christian Andersen's children's story *Dem Lille Havfrue* is Disney-fied via *The Little Mermaid*. While they are both tales of headstrong females, the translation from word to screen doesn't convey the same message about these young women and the worlds in which they live. Alternations within the concepts of body image, the conventions of matriarchy and patriarchy, and to the character of Ariel herself from the nineteenth century version to the modern-day cinematic romance demonstrate Disney's specific, restrictive view of the female heroine. Thorough examination of this film proves the Disney version to be less progressive than Andersen's tale, suggesting that an American audience would shy away from progressive women's fiction in order to maintain the art of social conditioning. [page 5]

Vu, Hanh T. "Economies in Transition: A Case Study of Vietnam" (Dr. Robert Pulsinelli)ß

The term "economies in transition" refers to the economic processes taking place in the economies which move from a centrally-planned economy to a free market. The late 1980s and early 1990s witnessed the fall of The Union of Soviet Socialist Republics (USSR) and the chain of socialist countries in Central and Eastern Europe, and also observed a sharp increase in the number of countries abandoning their central planning economy models and moving towards market-based economies. Most transitions share common negative and positive characteristics, and in spite of high expectations, at the beginning, the transition process did not bring back positive changes (Young). The long and pain-taking process only pays off in the long run. The transition process of Vietnam bears many similarities to those of other transition economies. After a slow-growing period, more positive consequences are observed. [page 6]

Wadlington, Meredith* "Standing in Place: Climbing the Trees of Southern Literature" (Dr. Wes Berry)

Because of their ability to both adorn and blemish a landscape, trees of Southern literature can symbolize the deeply-rooted connection between humans and the natural world of the American South. The relationship, however, is a tarnished one. Underneath the surface of the Southern sentimental pastoral lies a dark undercurrent of racism and oppression, echoing lines of

the grotesque imagery in Billie Holiday's *Strange Fruit*. My ecocritical analysis of Southern writers' use of tree symbolism begins with an examination of Zora Neale Hurston's novel *Their Eyes Were Watching God*, then uncovers ethereal, barren landscapes that haunt the works of such Southerners as Lewis Nordan, Eudora Welty and Richard Wright, concluding that trees of Southern literature are valuable non-human structures that tie characters to the heritage of the land. [page 5]

Walter, Anna*^ and Smith, Hunter*^ "Zeolite CGS: Ion Exchange and Synthesis" (Dr. Aaron Celestian)

Our role in the Crystal Kinetics laboratory was to synthesize gallosilicate zeolites, specifically natrolite and CGS analogues, and perform ion exchange studies with a focus on understanding the crystallographic transformations. We primarily used Raman microscopy, scanning electron microscopy, and X-ray diffraction to characterize the materials before and after ion exchange. Preliminary evidence suggests that despite the large ionic radius of Cesium, it does exchange into the small tunnels within the crystalline framework of the zeolites. This is shown by unit cell parameter changes and shifts in the Raman spectrum associated with elongation of bonds within the framework of the zeolites. Future work will investigate the time dependent nature of the ion exchange process to determine the mechanisms of the crystallographic transformations. [page 11]

Weitzel, Charlie See Devore, Wes

Wigginton, Sara K.*; Gilkison, Victoria A.*^; Racke, Danielle M.; and Meier, Albert J. "Ecology of *Panax quinquefolius*, American Ginseng in Mammoth Cave National Park" (Dr. Albert J. Meier)

Wild ginseng (*Panax spp*.) contains proteins that have been shown to improve psychological, physical, and immune performance. In North America, wild populations are in rapid decline due to overharvesting, poaching, over-grazing, canopy manipulation, and too-frequent fire activity. Given the many uses, it is critical to locate and conserve remaining populations. Our goals are to describe dynamics of ginseng at Mammoth Cave National Park, identify characters that predict reproductively, characterize individuals crucial to population growth, and predict habitats where *P. quinquifolius* may be found or reintroduced. From 2001-2005 we monitored two ginseng populations at MCNP. In 2009, we began a field search at MCNP to find additional populations. Here we present analyses of our monitoring data and an analysis of favorable habitat in the Park. [page 11]

Williams, Heather Rheunna; Marsh, Danielle Colby; and Wulff, Andrew "XRD Analysis of Fine-grained Sediments above the Barren River, Bowling Green, KY" (Dr. Andrew Wulff)

Samples for this study were collected from an outcrop on the northeastern bank of the Barren River in Bowling Green, Kentucky, and from sediments actually in the Barren River itself below the outcrop. The purpose of this study was to characterize and compare the clay mineralogy in the three sample sites. A cumulative weight analysis of sand to clay sized particles sieved from the river sample was plotted on a probability ordinance scale. Clay-sized particles accounted for 3.69% of the sieved sample. X-ray diffraction analysis was performed on the outcrop samples as well as the clay-sized particles from the sieved river sample. Phase analysis data obtained from each of the respective clays was then compared with the ICSD database. Preliminary results show quartz-dominated samples, consistent with a loess provenance. [page 7]

Williams, Heather Rheunna See Marsh, Danielle Colby

Williams, Kristopher "Influential Contemporary Animators" (Matt Tullis, M.F.A.)

The objective of my student research project is to visually communicate my knowledge of Matt Groening, Mike Judge, and John Krisfaluci. I am an aspiring animator and these three men have had a great influence on my work. Matt Groening is the man behind the long-running *The Simpsons* TV series, as well as the cult hits *Futurama* TV series and *Life in Hell* comic strip. Mike Judge created the infamous, youth-ruining *Bevis and Butt-head* and the satirical, yet moral, *King of the Hill* TV series. John Krisfaluci pushed boundaries with his television series *Ren and Stimpy* and *The Ripping Friends*. I propose to communicate my subjects through the visual communication of three digital collage art pieces and a written paper. [page 12]

Willis, Chad B. See Badwaik, Vivek in Graduate Abstracts

Willis, Chad B. See Bartonjo, Jane J.

Wilson, Amanda See Robinson, Sara

Wilson, John Max* "Leading Lyapunov Exponents from Predictability Times for Cosmological Models" (Dr. Keith Andrew)

We examine a cosmologically inspired system of non-linear partial differential equations. Although these equations are deterministic, they do not yield long-term predictability. This behavior can be characterized using a measure of the separation of initial conditions as a function of time. When the separation is exponential, the largest positive exponent is known as the Lyopunov exponent. We extract this exponent numerically using a program written in Mathematica that allows us to estimate the predictability time of the system. We find a large class of cosmologies lead to chaotic behavior. [page 11]

Wink, Tara "Modeling Acoustic Waves Using COMSOL MULTIPHYSICS" (Dr. Alexander Barzilov)

COMSOL MULTIPHYSICS is a finite element analysis and solver software package used to model various applications pertaining to physics and engineering. The acoustics module contains many built-in applications that allow modeling acoustic propagation in solids and stationary fluids. For example, one may predict the acoustic properties of a room by modeling it in COMSOL. Using the Pressure Acoustics module, I verified the accuracy of COMSOL's ability to model how precisely

sound waves propagate throughout a room. A small conference room at the Applied Physics Institute was modeled, including a box on a desk table in the room, with a point source setting on the table close to the box transmitting vibrations at a specific frequency. [page 14]

Wix, Jane Marie* and Rodgers, William Nicholas "Building a Flash Flood Climatology of the Appalachian Mountains" (Dr. Rezaul Mahmood)

The Appalachian Mountains are subject to flash floods due to interactions between complex terrain and frequent rainfall. However, there is a lack of research concerning flash floods in this region. This study addresses concerns by examining summer (June-August) rainfall frequency and intensity in connection with flash floods in the Appalachian region of eastern Kentucky and West Virginia during 1995-2005. Flash floods were identified using the National Climatic Data Center's (NCDC) Storm Database. Radar estimated rainfall data from the area NWS Weather Forecast Offices were provided by NCDC. In order to examine relationships between flash flood events and rainfall amounts for both states, the latter was categorized for: 0 to 24.99 mm, 25 to 49.99 mm, 50 to 74.99 mm, 75 to 99.99 mm, 100 to 124.99 mm, 125 to 150 mm, and 150+ mm. Subsequently, we have calculated flash flood frequencies associated with these rain fall amounts and categories. [page 11]

Wolff, Schuyler* "Determining the Progenitors of Type Ia Supernovae from Their Environments" (Dr. Louis-Gregory Strolger)

We present the recalculation of the rates of supernovae in local, low redshift ($z<0.1$) from the Nearby Galaxies Supernovae Search Project using an improved baseline designed to maximize SNe yield. Approximately 15 additional SNe of various types and ages have been discovered from the dataset and added to the 42 SNe already detected. This sample is sufficient to obtain an accurate rate of SNe in the local universe. The rates are weighted by volume, total light, and host galaxy type. Further spectroscopic data for the progenitor galaxies of each event will allow us to compare the rates using various galaxy properties. We present a detailed description of the resurveying of the NGSS dataset, the rate calculations, and the preliminary results. [page 14]

Wolff, Schuyler* See Pease, April

Woods, Kurt Wade* "Acoustic Properties of Wood and Carbonized Wood" (Dr. Christopher Byrne)

Wood is a naturally-occurring anisotropic cellular polymer with unique acoustic properties in its radial, tangential and longitudinal directions. Wood can then be carbonized, leaving a carbon monolith that retains the grain features of the wood. This monolith has acoustic properties that differ from the original specimen in magnitude but similar in directional characteristics. This presentation will cover the measurements made of carbonized wood and make comparisons to the original wood properties. It will be shown that velocity is reduced by 34 percent in some species by carbonization, and anisotropy is retained but reduced. These properties suggest the material can be as an alternative in acoustic applications. This is a part of an ongoing study in which wood is transformed into advanced materials such as composites and ceramics. [page 7]

Wynn, Colleen Elizabeth* "Comparatively Tracing the Hopelessness and Disadvantaged Community Link" (Dr. Holli Drummond)

There has been much research concerning hopelessness among impoverished urban neighborhoods in the U.S. This research has addressed many dimensions of hopelessness, including variation by race, associations with violence, as well as the origins of hopelessness. However, little research has focused on comparing the variation of these effects by country (i.e., comparisons of the urban disadvantaged experience in the U.S. with the urban disadvantaged in developing countries). Using two unique data sources, the Mobile Youth Survey (MYS) and a similar survey of disadvantaged adolescents in Medellin, Colombia, this study aims to comparatively examine the process of hopelessness among the "truly disadvantaged" at home and abroad. [page 15]

Xu, Jin See Fite, Jessica

GRADUATE ABSTRACTS

Aldridge, Jessica R.; West, Cassie; Hopper, Lindsay; and Hopper, Ronald "Conceptualizing the Computer Hacker: A Content Analysis of the Media" (Ronald Hopper, Lindsay Hopper)

The modern-day hacker is often defined as someone who uses programming skills to gain unauthorized access to a computer network or file. This presentation will focus on a content analysis of four major U.S. newspapers and their conceptualization and presentation of computer hackers in the news media. The findings of this analysis suggest that the media often mislabels and negatively present hackers to the public whether or not a computer crime has been committed. Consequently, the negative stigma associated with the label of hacker is perpetuated despite academic efforts to correctly identify and label specific categories of hackers. [page 6]

Anozie, Cynthia "Effect of High Glucose Cultured Human Endothelial Cells on the Kaolin Clotting Time" (Dr. Emmanuel Iyiegbuniwe)

Endothelial cell function may be damaged in diabetes mellitus as a result of hyperglycemia. The purpose of this study was to determine the effect of high glucose-cultured endothelial cells on kaolin clotting time. Eight healthy blood donors were included in the study. EAhy 926 endothelial cells were incubated with varying physiological glucose concentrations (5.5, 11.0 and 22.0 mM RPMI 1640 glucose medium) 24 hours prior to conducting the clotting test. The results of the different clotting times showed that 6 donors had longer clotting times for physiological glucose cultured EAhy 926 endothelial cells when compared to the other experimental conditions. The results showed no significant difference between the four groups ($p>0.1$) tested, however, shorter clotting times were observed in the 22.0 mM cells compared to the control culture ($p<0.1$). Further studies with large samples are recommended to establish the effect of glucose concentration on clotting time. [page 8]

Badwaik, Vivek; Bartonjo, Jane J.; Evans, Jesse W.; Willis, Chad; and Dakshinamurthy, Rajalingam "Novel Method for Recovery of Recombinant Proteins in Their Soluble Forms from *E. coli*" (Dr. Rajalingam Dakshinamurthy)

Escherichia coli is one of the most widely used hosts for the production of recombinant proteins. The use of bacteria as factories for recombinant expression is sometimes limited by their intrinsic tendency to accumulate the target protein into inactive insoluble aggregates, called inclusion bodies. While some proteins can be extracted and refolded from the insoluble inclusion bodies, others cannot. Therefore, there is a strong need for development of strategies to mitigate the formation of inclusion bodies during overexpression of proteins in bacterial hosts. This study will examine those specific challenges and will explore potential solutions to this problem. We aim to exploit synthetic molecular chaperones like gold to prevent the formation of inclusion bodies during over-expression of proteins in bacterial hosts. [page 12]

Badwaik, Vivek See Bartonjo, Jane J. in Undergraduate Abstracts

Bagwell, Matt "Practical Applications on Group Think, Expanding Diversity, and Examining Conflict and Its Resolution" (Drs. James Chappell and Saundra Ardrey)

Public and nonprofit administrators face a myriad of challenges that require the brain power of every individual within one's organization to resolve. We must foster an atmosphere that is conducive to open dialogue and discourse to broaden our collective toolkit on policy, process, and implementation methods and designs. Understanding group think and its implications on practice and application, embracing diversity and its expanding definitions within our organizations, and examining conflict and its implications for administrators in our organizations will provide a foundation for creating an atmosphere that is conducive to open discussion on policy, process, and implementation methods and designs. [page 9]

Barefoot, Jeffrey Allen "President Obama's Healthcare Proposal and the Affect on Healthcare Quality" (Dr. William Mkanta)

Healthcare quality has been addressed for decades with intensifying public debates and political posturing. The diversity of stakeholders within the healthcare industry has created a subjective view of healthcare quality based upon the unique perspective of the individual stakeholder. President Obama was elected to office promising to improve our national healthcare system and has recently proposed significant reforms. This research paper will investigate if it is possible to gain insight into the impact of healthcare quality concerning Obama's recent plan for healthcare reform. I am also interested in how the President's healthcare plan will affect quality in relation to three of the popular models for healthcare. The objective of my work is to identify the stakeholders most likely affected. [page 8]

Batra, Sumit; Sahi, Nilesh; Turner, Camille; Mikulcik, Kristen; Shockley, Heather; Conte, Eric; and Dakshinamurthy, Rajalingam "Efficient Purification Method for Human Fibroblast Growth Factor" (Drs. Rajalingam Dakshinamurthy and Eric Conte)

Members of the fibroblast growth factor (FGF) family have been associated with a variety of important functions including angiogenesis and wound repair, survival of neurons, and pathogenesis of various diseases. FGFs interact with specific FGF receptors and heparan sulfate proteoglycan on cell surfaces. Conventionally, the synthetic heparin sepharose column chromatography method was used to purify FGF, which is very efficient but has many disadvantages like long experimental time and cost and maintenance of heparin column. On the other hand, in the present study we devised an efficient off-column purification method with no disadvantages in the heparin column. In this newer purification method we used amberlite ion exchange resins having high exchange capacity, which is derived from carboxylic acid functional groups. These resins, which consist of styrene divinylbenzene or polyacrylic copolymers as macroreticular spherical beads, are easily regenerated using dilute mineral acid and can be used over wide pH ranges. These findings pave the way for purification of several other cationic proteins. [page 12]

Bhoyar, Shamrao Sandhya and Mandale, Pankaj "Effect of Cell Phone Use on College Students" (Dr. Christine Nagy)

Cell phone use is emerging as an addiction problem that has the potential to affect the health of university students. This study examined the relationship among sleep, depression, social interaction, dependence and cell phone use. This cross sectional prospective study involved a survey on 171 undergraduate students. Analysis showed increased dependence with high use of text messaging while driving and high use of cell phone primarily to interact with friends in the afternoon and night. Students reported feeling safe with cell phone and indicated a high self-efficacy for not using it if asked by the professor in class, if its use affected their health and if stricter university policies were employed. Analysis showed absence of peer influence on students for cell phone use. This study will help to increase our knowledge and create awareness about potential health concerns associated with cell phone use. If warranted, health programs could be developed to address these health concerns. [page 13]

Bhoyar, Sandhya Shamrao "Normative Beliefs of Students Regarding H1N1" (Drs. Christine Nagy and Steve Nagy)

There has been an alarming increase of H1N1 cases globally**.** This cross sectional study assessed students' perceptions and awareness about H1N1 after its outbreak in May 2009 in college students (N= 503) before the administration of H1N1 vaccine on campus. Questions appraised students' knowledge of preventive methods for H1N1, influences to get immunized, barriers preventing them from vaccination and sources of information about H1N1. Results indicated that 37% believed they were at risk for H1N1, 25% intended to get vaccinated and 49% were aware of preventive methods. Few saw parents or friends (18%) as influences to get vaccinated and only 6% identified barriers that might prevent them from getting vaccinated. Students reported learning about H1N1 from sources like television (90%), friends and family (92%), the internet (81%) and teachers (78%). Results will help program planners identify communication channels and strategies to use to develop education and awareness programs to promote H1N1 vaccination. [page 12]

Bhoyar, Sandhya Shamrao See Mandale, Pankaj Anandrao

Bhoyar, Sandhya Shamrao See Mandale, Pankaj Anandrao

Brown, Katie See Greco, Lindsey

Bryan, Kendrick William "Access to Opportunity: A Discussion of Title IX" (Dr. Patricia Minter)

Title IX refers to the Educational Amendments of 1972 and does not expressly refer to any athletic programs, but debate within the two houses of Congress indicated athletics would be impacted by the legislation. The statute prohibits gender discrimination in educational institutions that either directly or indirectly receive federal funds. Ten key areas are addressed by the law: Access to Higher Education, Athletics, Career Education, Education for Pregnant and Parenting Students, Employment, Learning Environment, Math and Science, Sexual Harassment, and Standardized Testing and Technology. While Title IX has created a sex-segregated athletics system, inequity in athletic opportunities is still commonplace. [page 14]

Charsombut, Nottamon "Global Leadership and Intercultural Communication Skill Needed for Global Organizations and Business" (Dr. Mark Doggett)

The world hastily develops in many kinds of technology and business. This advancement has brought international recruitment. People work as such this world is one big organization; thus, intercultural association becomes an important competence of any organization. Leadership also needs to deal with this issue. Proper leadership skills and intercultural knowledge can bring the organizations to achieve their goals. Courses in colleges or university both undergraduate and graduate should require courses about leadership and communication skills. Students should know practice or build their leadership and communication ability which is essential in organizations. Also, those organizations or companies can provide these issues as a training program to develop their employees. [page 8]

Chugh, Pooja and Kumar, Chaitra Anil "Occupational Hazards Associated with Dental Professions" (Dr. Vijay Golla)

Dental professionals are susceptible to a number of occupational hazards resulting in adverse health effects. These include percutaneous exposure incidents (PEI); exposure to infectious diseases (including bioaerosols), radiation, dental materials, and noise leading to musculoskeletal disorders; dermatitis, respiratory disorders, eye injuries, psychological problems, and other potential health effects. In the past, dentist and dental hygiene students used to stand at the dental chair, and were at risk of developing varicose veins, phlebitis, fallen arches, and scoliosis. Today, students are instructed to sit at the dental chair, with a potential for developing hemorrhoids, a stiff neck, scoliosis or arthritic knee joints from prolonged inactivity. This goes along with today's patient positioning in the dental clinic where dental patients are positioned almost horizontally unlike yester years where patients sat upright, and could expectorate or regurgitate easily to clear their throats. Most dentists are aware of occupational hazards at their workplace, but the level of protection against these work related injuries varies. As part of infection control protocols, dentists should continue to utilize personal protective measures and appropriate sterilization or other appropriate and effective disinfection techniques. It is recommended that regular workshops and informational seminars on occupational hazards be organized for all employees of dental clinics periodically. Such activities could enhance learning and application of preventive measures to help reduce and control occupational hazards in dental professions. [page 13]

Cross, Dean and Peimanovic, Nermin "Higher Voltage Distribution System Feasibility Study" (Dr. Stacy Wilson)

Due to the expansion of south Warren County, WRECC has developed an interest in studying the benefits of a higher voltage distribution system due to the addition of the Joseph Warren School, and the expansion of the property near the Gander Mountain store and the Natcher Parkway extension. A team of senior electrical engineering students are conducting this feasibility study for WRECC. With this greater demand of power, the team will be evaluating the feasibility of a 7,200/14,400 Y to 14,400/25000 Y voltage conversion. Benefits of using 25,000 volt systems are that the systems operate at half the current and a quarter of the voltage drop compared to a 14,400 volt system. By using historical and future loading information about this area, the team will explore the feasibility of upgrading this system for a minimum of 20 years using tools such as Milsoft Wind. [page 15]

Dennis, Roger See Galbreath, William Adam

Dhar, Sohini See Koirala, Bhawana

Dhar, Sohini and Nair, Rasmi "Healthy-home Environment: Asthma Awareness for Refugees in South-Central Kentucky" (Drs. Emmanuel Iyiegbuniwe and Steve Nagy)

Public Health faculty & students at WKU collaborated with the Housing Authority of Bowling Green (HABG) to conduct a series of focus groups. This entailed discussions with different ethnic group samples to identify potential risky environmental health practices. Each focus group consisted of 6-8 members who were identified by immigrant gatekeepers. Meetings occurred at the HABG learning center during late afternoon hours; the format introduced the purpose of the focus groups and required participants to respond to a standard series of questions patterned after theoretical constructs. When necessary, English interpreters were utilized. Most groups acknowledged the role of personal responsibility in asthma care and prevention. Susceptibility and severity indicators varied considerably. Barriers to prevention largely focused on ignorance and laziness. Cleanliness beliefs were similar across groups and cues to action were misunderstood. Theoretical constructs can assist in identifying immigrant characteristics that can be utilized to develop environmental health interventions. [page 13]

Epperson, Ann E. "Internet GIS as a Historic Place-Making Tool for Mammoth Cave National Park" (Dr. Katie Algeo)

This project lays the groundwork for an Internet delivered Public Participation Geographic Information System to facilitate exploration and discovery of the past communities of the Mammoth Cave Park area. The emergence of Internet Web 2.0 design along with distributed GIS services allows for anyone to interact with and add to the information found on central internet sites. Historical geography often relies upon public participation from individuals outside the academic world to provide narrative descriptions, photographs and manuscripts of past places and events. PPGIS allows for visualization of the pre-park communities in new and unique ways. A PPGIS website for Mammoth Cave will create a central location for dispersed and disparate park data resources related to pre-park Mammoth Cave communities to be presented with a geographic context. [page 6]

Gade, Prabhavathi "Investigation of Volatile Products from Wood Pyrolysis" (Drs. Eric Conte and Chris Byrne)

In this research we are following the thermochemical degradation from the heating of biomass in the absence of oxygen. The objective is to investigate the volatile by-products from wood pyrolysis for the production of chemicals and for fuel use. We are investigating the volatile products obtained at different heating rates by GC-MS. Calorific values of the condensed vapors, collected at different conditions of flash, fast and slow pyrolysis are to be measured using a bomb calorimeter. Present results indicate that heating rates influence the apparent temperatures a particular compound is released. The information we obtain will be valued by industries such as charcoal and activated carbon producers which currently perform biomass pyrolysis by allowing them to form approaches that optimize their energy use and minimize waste. [page 16]

Galbreath, William Adam; William, Todd; and Dennis, Roger "The WKU Vineyard" (Dr. Todd William)

There are now two vineyards at the Western Kentucky University Farm. The vineyard in front of the greenhouse is a demonstration vineyard for students and the public to learn about establishing and growing a vineyard. I conducted my research at the newest vineyard, which was established in May 2009 behind the greenhouse. I studied different types of weed control under the grape vines and the effects of treatment on the growth of the plants. The four weed control treatments are no treatment, sprayed with Roundup, tilled with a rotary tiller, and mowed. I used six rows of grapes, each of which had 24 plants (six plants for each of the four treatments). This paper presents the results of my research and recommendations for weed control in vineyards. [page 15]

Gangula, Srilatha "Degradation of Chlorinated Phenols in Swine Waste" (Drs. Eric Conte and John Loughrin)

Naturally occurring plant derived phenols can be degraded through bacteria in swine waste. Chlorinated phenols, which are not naturally present in the environment, are toxic and generated from industrial activities. It is our hypothesis that bacteria located in swine wastes may also have the ability to degrade chlorinated phenols. Identifying situations (and organisms) in which degradation of pollutants occurs is important field of research. Experimental work was focused on measuring the degradation of seven chlorinated phenols in swine waste using solid-phase microextraction (SPME) and gas chromatography(GC).Our work focused on development of methods for the quantification of chlorinated phenols in swine wastes and results of bioremediation research. [page 8]

Ghugare, Tushar and Colon, Luis "Exploring Zirconia as a Column Packing Material in HPLC" **(**Drs. Cathleen Webb and Eric Conte)

Zirconium (IV) oxide or ZrO_2 sometimes known as zirconia, is a metal oxide with a very unique surface chemistry. In this research, the complex chemistry of zirconia surface is examined. Strong hard Lewis acid sites present on a zirconia surface can interact with hard Lewis base sites resulting in interactions that have been successfully exploited in the separation of proteins. The physical and chemical properties of zirconia from a chromatographic point of view are described. The dependence of the surface area, pore size, and pore volume on thermal treatment is also emphasized. The absorption capability of ATP by zirconia was studied with some initial spectra characterization. In a further research, zirconia is exploited for the separations of ATP, AMP and ADP. Adenosine-5'-triphosphate (ATP) one of the nucleotides, will be adsorbed to the surface of the porous zirconia. The immobilization efficiency onto the porous zirconia material will be evaluated in terms of the amount of protein attached to the compound and from the biological activity remaining after the immobilization step. The effects of pH and buffer concentration will also be presented. The results will be compared with a similar experiment with porous silica of similar material. The aim is to see how well zirconia can be substituted with silica in protein separations. [page 13]

Graves, Melinda "Doppler-broadening of Light Nuclei Gamma-ray Spectra" (Drs. Phillip Womble, Alexander Barzilov, and Keith Andrew)

Non destructive methods of material interrogation are used to locate hidden explosives and thwart terrorism attempts. In one such method materials are bombarded neutrons which react with the nuclei of the atoms within causing a de-excitation process emitting a gamma ray. The spectrum displayed by the collection of these gamma rays gives valuable information regarding the material's elemental make- up. In an article written by P. C. Womble, et al. it was hypothesized that gamma-rays from neutron-induced gamma-ray reactions on light elements with atomic numbers less than 20 were Doppler-broadened. My research using neutron interrogation of Carbon, Water and Ammonium Nitrate will attempt to prove this hypothesis. Proving this should assist in the development automated threat detection. [page 12]

Greco, Lindsey and Brown, Katie "Personal Strategies for Increasing Exercise Intensity" (Dr. Steven Wininger)

This study investigated the use of personal strategies for increasing exercise intensity. Participants consisted of 116 university students (83 female, 33 male). Participants ran or walked on a treadmill for two miles at their preferred pace during the first of two sessions. After the first session, participants were prompted to develop strategies for improving their two mile time in the second session scheduled for one week later. Strategies included things done both immediately before and during the next exercise session. Males completed the two miles significantly faster than females in both exercise sessions. Males also had significantly higher rates of perceived exertion than females during the second session, in other words, males worked significantly harder to improve their times. [page 13]

Hildebrant, Jake "Management of Integrated Alternative Energy Curriculum" (Dr. Mark Doggett)

The popular field of study in today's falling market is alternative energies. Many colleges are offering degrees in alternative energies, but are their graduates finding the positions upon graduation? I will address this issue, as well as give examples of how Madisonville Community College (MCC) has integrated alternative energies into the AIIT program without limiting students' abilities to find employment upon graduation. Currently MCC has purchased a 3kw solar panel kit, a wind park including 5 wind turbines, and a bio-diesel processor to teach its students different processes associated with alternative energies. [page 8]

Huma, Ansari See Mande, Sheetal

Jain, Ajay See Kancharla, Jahnavi Reddy

Jones, Morgan "A Novel Pervious Cement Reaction Barrier (PCRB) In Situ Arsenic Remediation System" (Dr. Cathleen Webb)

Remediation of Superfund hazardous wastes sites with contaminated groundwater is a key research area. We examined a pervious cement reactive barrier system (PCRB) in which the modifier is incorporated directly into the matrix pervious cement barrier. As the groundwater flows through the barrier, contaminants will be trapped and/or modified, thereby reducing the contaminant plume and the necessity for further treatment. Such a system will require little or no active maintenance; furthermore, characterization of contaminants at the site would allow the PCRB to be "tailored" to specific characteristics. Our primary contaminant of interest is arsenic. This project used batch, column, and adsorption experiments to evaluate and model the adsorptive capacity of the PCRB for arsenic uptake. [page 6]

Kancharla, Jahnavi Reddy and Jain, Ajay "Overexpression of 'Osmotin-Chitinase' Gene Chimera in Medicago to Develop Transgenics Resistant to Various Biotic and Abiotic Stresses" (Dr. Shivendra Sahi)

Medicago is widely used as a forage crop but is often susceptible to pathogenic infections and exhibits low growth in drought conditions. Genotypes of Medicago that show good per cent regeneration were selected. AGL1 strain was transformed with binary vector pBTEX harboring osm-chi gene chimera with nptII as a selection marker and were co-cultivated with calli generated from hypocotyl explants. Transformed calli were grown on callus inducing medium containing kanamycin (50 mg/L) and carbenicillin (350 mg/L).Transformed shoots would be grown on the root inducing medium for developing into plantlets and would then be transferred to the green house. Molecular and morphophysilogical studies would be carried out for the confirmation of osm-chi gene chimera in the transgenics and their degree of resistance to various biotic and abiotic stresses. [page 6]

Kaya, Crystal Marie "Benevolent vs. Hostile Sexism: Impact on Work Performance for Women in Turkey" (Dr. Tony Paquin)

As women become more prominent figures in the work place, it becomes increasingly important to study the unique situations, such as benevolent and hostile sexism, which they face. Benevolent sexism encompasses subjectively positive (for the sexist) attitudes toward women in traditional roles: protective paternalism, idealization of women, and desire for intimate relations. Hostile sexism, however, encompasses the negative equivalents on each dimension: dominative paternalism, derogatory beliefs, and heterosexual hostility. Previous research has found that exposure to sexism, especially of the benevolent variety, can result in reduced performance outcomes for women. Most studies to date which have assessed the impact of benevolent vs. hostile sexism on women's performance have done so in the context of more egalitarian western society. The present study seeks to contribute to this cultural gap in the literature by examining the impact of benevolent and hostile sexism on performance for women in four textile factories in Turkey. [page 13]

Koirala, Bhawana; Dhar, Sohini; and Sadhnani, Mahesh "Implications and Challenges of Dental History Forms in University Dental Clinic" (Drs. Terry Dean and Christine Nagy)

Utilizing dental history forms are integral in developing and individualizing oral hygiene education for patients as well as essential components in training dental hygiene students. One thousand records(532 to date)of visits by the non-student population visiting the Western Kentucky University dental clinic that occurred between September 2006 and December 2008 will be reviewed. Items reviewed included demographics, utilization of dental services, oral hygiene instruction, toothbrush types, fluoride use, previous experiences, questions related to systemic health, and nutrition. More than forty items were assessed upon WKU's human subjects review board approval. Findings revealed anticipated and somewhat surprising responses to questions asked related to nutrition, oral health and general health. [page 13]

Kumar, Chaitra Anil See Chugh, Pooja

Kunapuli, Phani Chandrika and King, Rodney "Is Transcription of the Bacteriophage HK639 Right Operon Antiterminated?" (Dr. Rodney King)

Sequence analysis of Bacteriophage HK639 revealed the presence of a *put*-like element in the left operon of the phage. *Put* sites were first discovered in HK022 and have been shown to promote transcription anti-termination by unique RNA-mediated mechanism. We have shown experimentally that the HK639 *put*L RNA suppresses transcription termination. Curiously, there is no *put*R like site in the right operon of HK639. To identify genes or sites required for anti-termination in the right operon of HK639, a suppressor tRNA gene (tRNAgly) is inserted at different locations by the recombineering technique. The effect of the insertions was qualitatively monitored by assaying phage release. A tRNA insertion into the HK639 M3 gene prevented phage release suggesting that M3 gene is essential for phage production. To quantitate tRNAgly production from the fusions we plan to monitor the expression of a luciferase reporter plasmid that carries a lux gene amber mutation. [page 15]

Kurlawala, Zimple A. "Sexual Violence Risk Reduction" (Dr. Stephen Nagy)

The purpose of this study was to compare victims and non-victims on traits that may identify targets for intervention based on an interpersonal and sexual assault survey. 6.7% of females and 1.3% of males reported being a victim of sexual violence. Being white, single and living away from campus were risk factors. Females who practiced regular religious services identified their risk at 5% compared to those females who do not practice religious services at almost double the risk (9.4%). 10.7% of males and 17.6% of females reported being stalked or receiving unwanted attention. Only 6% of respondents thought that abuse was a concern for college students. Literature shows that victimization is underreported. Implications are that personalized approaches must be developed for sexual violence risk reduction among students. [page 6]

Lee, Yu-Ting and Tsao, Wan-Ting "2010 ATMAE Presentation Proposal" (Dr. Mark Doggett)

This presentation will present photography techniques and technologies that combine knowledge with the computer. It will change the image in manufacturing and construction techniques, as well as accreditation requirements. In this presentation, we will present how a student uses the photography skills to develop the academic knowledge and the future industry. [page 9]

Li, Chao and Shearer, Darlene "Adolescent Knowledge and Attitudes about Sex and Abstinence: A Cross-sectional Descriptive Study" (Dr. Darlene Shearer)

Premarital sexual activity among teens is a controversial issue in the U.S. WAIT (Why Am I Tempted) Training is a curriculum that delivers key health and youth development messages through abstinence only education. Pretest questionnaires from 2,147 adolescents aged from 12 to 18 year of age who participated in WAIT training were analyzed. The findings show that measures of teen knowledge, beliefs, and confidence about abstinence and sexual activity differed significantly by gender, race, age, and school type. Overall, males had more knowledge and were more pragmatic about teens being sexually active and the challenges of being abstinent. Females had stronger beliefs about negative outcomes of sex and positive benefits of abstinence and were more confident about being abstinent. The poster will describe these and other student differences. [page 13]

Li, Chao and Shearer, Darlene "Effectiveness of WAIT Training – an Abstinence-only Education Model" (Dr. Darlene Shearer)

This study compares pre and post scores of teens to determine the effectiveness of an abstinence-only training program conducted at public and private schools in a large county of Florida. Participants were 12 to 18 years of age and participated in five hours of WAIT (Why Am I Tempted) Training, a curriculum that delivers key health and youth development messages about abstinence until marriage. Pre and Post tests were linked by a unique ID number that resulted in 1230 matched pairs. Findings showed that knowledge, beliefs, and confidence related to abstinence improved significantly as a result of the training. The improvement was notably varied by demographics and by school type. The poster will also discuss changes in student confidence about abstaining from sex before marriage. [page 13]

Li, Chao and Fan, Frank "Is Human Resource an Untackleable Challenge in China's Rural Health Care Reform? " (Dr. Frank Fan)

With the success of its economic reforms over the past three decades, China's government has made great efforts to launch health system reforms. However, there is much public dissatisfaction with inequitable access to health care services and escalating costs. The lack of trained health personnel, especially in remote areas, has been neither well addressed nor studied. This presentation will show that China is facing a serious shortage of well trained health care personnel in rural areas. China's current health care manpower problems will be demonstrated on three perspectives: quality, quantity, and distribution. The poster

will also describe causes of these problems and compare China's health workforce with other developed countries. Suggestions for what should be done to enhance the health workforce in rural China will be presented. [page 13]

Loughrin, John See Rodgers, William Nicholas

Lovanh, Nanh See Rodgers, William Nicholas

Mahan, Margaret See Selvaraj, Tamilselvi

Mandale, Pankaj Anandrao and Bhoyar, Sandhya "Cultural Variation and Its Effect on Student Teacher Interaction and Learning" (Dr. Grace Lartey)

A cross sectional study was conducted by distributing surveys to international students (n=132). Analysis showed 90% of full time students aged 18to 27 years from public institution were international students. Students researched about WKU and the U.S. culture through internet (98%), WKU website and from student organizations before enrolling at WKU. International students interacted more than twice as much with their faculty in their country than in U.S. Communication with home- country faculty was done face-to-face (100%), while at WKU, students preferred email followed by face-to-face (95%) and phone calls (52%). As teaching method being different in their country and English not being the primary language, international students reported stress. Thus these findings show that the difference in cultural variation increased stress in international students and affected student teacher interaction, thereby affecting their learning and hindering effective teaching. [page 13]

Mandale, Pankaj Anandrao; Bhoyar, Sandhya; and Nagy, Steve "Adolescent Stress Perception, Emotional Indicators and Risky Behaviors" (Dr. Steve Nagy)

We examined student reports of high and low stress perception with various emotional and coping indicators using data from the Alabama Adolescent Surveys (1988, 1990, 1993, 1998 and 2001 N=1857-6168). Bivariate measures using best fit around the 50th percentile were used for comparisons conducted on the independent measure of high and low perceived stress and the dependent measures. Findings from the five different cross-sectional cohorts show consistencies across years: emotional indicators of sadness and hopelessness along with negative coping strategies such as smoking, alcohol abuse and bulimia are consistently and significantly associated with high perception of stress. Prevention programs for substance use and mental health must incorporate stress management strategies to offset issues related to coping and mood among adolescent populations. [page 13]

Mandale, Pankaj Anandrao; Nicholson, Thomas; Duncan, David; White, John; and Nagy, Steve "Meditation as Stress Management in Graduate Public Health Students" (Drs. Thomas Nicholson, David Duncan, John White, and Steve Nagy)

The effectiveness of an in-class stress management intervention for improving course content retention was tested with a cross-over design in two introductory graduate biostatistics classes. A pretest duplicating items on the midterm and final exam was administered to all students at the first class meeting. Identical midterm and final exams were administered in both classes. During the first half of the semester, each class session in one section was preceded by a ten minute deep breathing stress management procedure (n = 29). During the second half of the semester this procedure was discontinued in the first section and implemented in the other section (n = 9). There were no significant differences by age, citizenship, or gender between the two sections of the course. Students in both classes showed significant gains in knowledge, the stress management intervention showed no significant impact on gains. [page 13]

Mandale, Pankaj Anandrao and Shearer, Darlene "Faculty Insights and Experiences with Academic Dishonesty of Students" (Dr. Darlene Shearer)

This descriptive study examined experiences and perceptions of faculty regarding cheating and plagiarism. Over 120 faculty members at WKU responded with 47% of 50 years of age. Nearly 80 % of responders agreed that plagiarism is a big problem; 81% said they had caught students cheating in their classroom; and nearly 90% said it is easy to spot plagiarized work. More than half believed students who cheat do so numerous times. However, contrary to one of the study hypotheses, only 22% of faculty believed that international students commonly cheat. Nearly half think that U.S. students cheat as much or more than international students. The presentation will discuss other faculty beliefs about academic honesty, its causes and how these beliefs influence the actions they take with students when academic dishonesty occurs and solutions to eliminate it from the WKU campus. [page 13]

Mandale, Pankaj Anandrao and Shearer, Darlene "Study on University Student Attitudes, Beliefs and Perceptions Related to Academic Dishonesty" (Dr. Darlene Shearer)

This descriptive study examined attitudes, beliefs, and perceptions of 140 international students at WKU. The findings showed that nearly half of the students reported little or no prior knowledge of plagiarism and 45% indicated that plagiarism is not an important concern in their country of origin. In spite of receiving advice from friends (40%) and warnings from professors (66%), 28% of responders said they had cheated or plagiarized at least once while at WKU. Another 6% reported engaging in these practices numerous times. Nearly 34% said they believe academic dishonesty is common among international student classmates while 44% felt that U.S. students also plagiarize. The presentation will demonstrate and discuss the association between student attitudes and beliefs, their academic behavior, discuss student opinions about preventing or reducing academic dishonesty and the implications for public health training programs. [page 13]

Mandale, Pankaj Anandrao See Bhoyar, Sandhya Shamrao

Mande, Sheetal K. and Ansari, Huma "Factors Associated with Teeth Whitening" (Drs. Terry Dean, Steve Nagy, and Christine Nagy)

The novelty of having teeth whitened has practically disappeared on today's landscape, seemingly becoming more of a routine part of elective procedures in improving one's appearance. This study assessed tooth whitening behavior among college students. A non-random sample of 541 students took part in the study. Results showed 42% were not satisfied with present color of their teeth, 46% had queried a dentist about tooth whitening procedures, and 46% reported past history of having their teeth whitened. Chi-square analysis compared teeth whitening behavior based on demographic characteristics. Logistic regression was used to predict teeth whitening behavior. Surprisingly, dissatisfaction with teeth color was not significantly associated with teeth whitening. [page 13]

Miller, Benjamin Verlinden; Lerch, Robert N.; and Groves, Chris "Examining the Hydrology of Carroll Cave and Toronto Springs, Missouri through Groundwater Tracing and Geochemistry" (Dr. Chris Groves and Pat Kambesis, M.S.)

In karst, relationships between land use and groundwater quality are interconnected. The complexity of karst makes identification of these connections difficult to determine. Carroll Cave, Missouri is a fluvio-karst system with biological and speleological significance. Initial delineation of a recharge area for Carroll Cave indicates an area of 15 km2. Thunder River, in Carroll Cave, was traced to 8 springs at Toronto Springs, a multi-spring system. Five springs appear to have sources independent of Carroll Cave. From geochemical properties of each spring, water chemistry differences between the outlets are evident. Dataloggers, water analysis of ion and bicarbonate are defining variations in water chemistry. By dye tracing and creating geochemical signatures for individual springs, source waters for Toronto Springs are being identified. [page 6]

Mikulcik, Kristen See Batra, Sumit

Muneeruddin, Khaja and Williams, Kevin "Reaction of Platinum (II) Complexes with Peptides" (Dr. Kevin Williams)

Platinum (II) diamine and triamine complexes are known to react readily with proteins, and the sulfur atom of methionine is a key target. Chelation with the amide nitrogen is possible for many platinum (II)diamine complexes with peptides. Previously, we have found that the presence of bulk on the amine ligands can alter the stoichiometry and/or coordination preferences in the reactions of platinum complexes with methionine and N-acetylmethioine. Here, we have investigated the reactions of several platinum(II)complexes with two model peptides, FMRF and ACTH (1-10)(sequence SYSMEHFRWG), both of which contain an internal methionine residue. The platinum complexes differ in leaving groups and amount of amine ligand bulk. HPLC with a cation-exchange column has been used to monitor the rates of reaction and to determine the number of products. [page 6]

Nair, Rasmi See Dhar, Sohini

Namara, Sarah Joy "Simplified Accounting Management: A Key Factor for a Successful Lean Organization Management" (Dr. Mark Doggett)

Over the past years, lean, just-in-time or quality management concepts have been employed in various industries to emphasize waste elimination, one-piece flow in all processes and continuous improvement. Their application has illustrated significant positive change. Accounting, however, has largely been isolated in lean transformation. Therefore, there is an increasing need to streamline and simplify accounting systems for easy understanding by all the parties (executives, employers, and shareholders). This presentation examines elements that should be eliminated from the traditional accounting systems in order to easier provide time-based products. The presentation will also suggest tools that would facilitate implementation of the simplified approaches and their continuous improvement. [page 8]

Nutakki, Gopi Chand "A Comparison of Descriptors of Keypoints Appearance vs. Orientation Histogram" (Dr. Qi Li)

Descriptors of image features are expected to be robust with respect to varied imaging conditions, including scale, orientation, etc. Appearances and orientation histograms (such as SIFT) are two popularly used descriptors in image matching applications, such as stereo correspondence, object recognition. In the context of scale and orientation invariant matching, appearance will be normalized to the standard size and orientation. In this research, we present a comparison study of these two kinds of descriptors of key points on stereo correspondence. [page 8]

Peimanovic, Nermin See Cross, Dean

Porter, Brandon Lee "Evaluating Variability in Island Karst Disturbance in Puerto Rico from Application and Refinement of the Karst Disturbance Index" (Dr. Jason Polk)

Karst environments are landscapes that contain important resources, including groundwater resources and are easily disturbed by a variety of human impacts. The Karst Disturbance Index (KDI) is a holistic tool used to measure anthropogenic impacts on karst environments. The purpose of this research was to create a KDI score for Arecibo, Puerto Rico and to refine the indicators and scoring to best utilize the KDI for karst management in an island karst setting. Application of the KDI will educate the public and help to foster stewardship of the karst resources in Puerto Rico. Preliminary results indicate a prevalence of disturbance ranging from urbanization to agriculture, with additional research needed to identify further disturbances and mitigation recommendations. [page 12]

Porter, P. Elliott "Human Factors Analysis in Naval Aviation" (Dr. Mark Doggett)

Human error is an ongoing problem in the aviation industry. Figures show these errors are blamed for up to 80% of aviation mishaps. Of these, the term "operator error" is listed up to 60% of the time. Determining the human factors involved in aviation mishaps through root cause analysis (RCA) is a valuable key in preventing future mishaps. The Human Factors Analysis and Classification System (HFACS) developed by Drs. Scott A. Shappell and Douglas A. Wiegmann has become the method of choice in the Department of Defense (DOD). In 2009, the Navy institutionalized this system into aviation mishap investigation. This presentation will show how the system works as an RCA tool in Naval aviation mishap investigation, its benefits in mishap prevention, and the utility of the system in other industries. [page 6]

Puglia, David "The Culture Cache: Western Kentucky University Folklife Archives Past and Present" (Dr. Michael Ann Williams)

Western Kentucky University has a rich history of folklore scholarship, dating back to at least the early 20th century and Gordon Wilson. Folklore archives across the nation have long been repositories for the fieldwork of folklorists, and a place to look to supplement future studies. Western Kentucky's Folklife Archives are no exception, housing thousands of impressive pieces donated from many generations of folklore scholars. Yet very little has been written about the Western Kentucky Folklife Archives Through oral history and primary documentation, my paper attempts to capture a brief history of the Folklife Archives from the earliest days of Gordon Wilson, D. K. Wilgus, and Lynwood Montell to the present day. [page 14]

Quintanar, Arturo I. See Rodgers, William Nicholas

Rodgers, William Nicholas; Mahmood, Rezaul; Quintanar, Arturo I.; Loughrin, John; and Lovanh, Nanh "A Sensitivity Study of Energy Fluxes and Evaporation from a Waste Lagoon to Different Stability Model Formulations" (Dr. Rezaul Mahmood)

Emissions from agricultural and animal operations directly impact the quality of life and health of people that live and work in proximity to these sources of pollution. One known source of malodorous gases and particulate matter are anaerobic lagoons which are widely used in the United States to collect, treat and store effluents from concentrated animal feeding operations (CAFOS). The present research is part of an ongoing air quality research program whose general goal is to establish phenomenological relationships between emissions from anaerobic waste lagoons and the meteorological and atmospheric stability conditions that control it. As a first step towards that, it is proposed to test the sensitivity of evaporation and sensible heat fluxes estimates from three methodologies. [page 12]

Rodgers, William Nicholas See Wix, Jane Marie in Undergraduate Abstracts

Saculla, Meghan Marie "Moral Judgment Development, Narcissism, and Electronic Media and Communication Devices: Trends and Discussion of Future Directions" (Dr. Pitt Derryberry)

Recently, some disturbing trends in moral judgment development were reported (Thomas and Bebeau, 2008). In national samples of undergraduates and graduates compiled over the last decade, Thoma and Bebeau cited increases in personal interests moral reasoning (i.e., the least developmental advancement) and decreases in postconventional moral reasoning (i.e., the most developmental advancement). Thoma and Bebeau suggested that certain broad-based social trends occurring over the last decade may be responsible for these changes. Such trends include increases in narcissism and use of electronic media and communication devices (i.e., social networking websites, cellular phones, and iPODs). These trends may have translated to increased self presentation and self isolation. If so, moral judgment developmental changes are sensible. Thus, the current study investigated the degree to which moral judgment development is linked to narcissism and the use of and attitudes toward electronic media and communication devices. Results support that these variables are linked. [page 13]

Sadhnani, Mahesh Hiralal "Erroneous Perception of Body Size and Suicide Contemplation among Adolescents" (Drs. Cecilia Watkins and Marilyn Gardner)

Suicide is the third leading cause of death among young people ages 15 to 24. Suicide or an attempt to commit suicide is often preceded by stressful events in one's life. Ridicule from peers can be such a stressful event and can precipitate suicide ideation among adolescents. There has been a growing trend of cultural bias against obese and overweight individuals. This stigmatization has lead to children being increasingly conscious of their weight. Data from the National 2007 Youth Risk Behavior Survey (YRBS) were analyzed to explore the relationship between suicidal ideation and suicide gestures/attempts and the perception of body size among youth who accurately and inaccurately identified their BMI status. Results from this study, as well as the public health implications, will be discussed. [page 6]

Sadhnani, Mahesh Hiralal See Koirala, Bhawana

Sahi, Nilesh See Batra, Sumit

Sanders, Kyle "The Unfathomable, the Unforgivable, the Unpardonable: How the Literature of Hawthorne Heightens the Guilt of Shameful Sin" (Dr. Sandra Hughes)

An unpardonable sin is a sin so serious, forgiveness is beyond the reach of God's grace. The theme of Unpardonable Sin has resonated throughout many works written by Nathaniel Hawthorne. As a man whose ancestors took part in a chapter of

America's shameful history, Hawthorne uses the idea of heavy guilt that burdens his protagonists. Their own selfish, immoral choices or thoughts cause many events to unfold that leave the character (and others) in misery and/or disgrace, far from being saved by the mercy of God. This essay demonstrates the aforementioned issue, using two of Hawthorne's most conflicted and corrupt creations: Reuben Borne from *Roger Malvin's Burial* and Aylmer from *The Birth-mark*. The selfish actions of these literary characters are prime examples of Hawthorne's fixation of unpardonable sin. [page 14]

Selvaraj, Tamilselvi; Huskey, Steve; and Mahan, Margaret "Prey-Induced Phenotypic Plasticity in the Teeth of Hatchery vs. Wild Largemouth Bass" (Dr. Steve Huskey)

Fishes are highly phenotypically plastic. So, aquacultured fish may vary significantly from their wild counterparts which can adversely affect their survival after release. This study tries to determine if oral and pharyngeal jaw dentition differed between hatchery and wild bass. Scanning electron micrographs of the jaws were compared for the number and characteristics of teeth. Wild bass feed on live elusive prey using their villiform oral jaw teeth to secure prey trapped between the jaws during capture. In contrast, hatchery reared fish maintained on pelleted food suggest, their oral jaw might develop differently (fewer and reduced size) than their wild counterparts. This difference could have a significant effect on prey-capture efficiency when introduced into the wild. [page 16]

Sengul, Sevgi and Atici, Ferhan "Modeling with Fractional Difference Equations" (Dr. Ferhan Atici)

Statistics from the American Cancer Society (ACS) show that breast cancer is the leading cancer type in women under 65. Accordingly, mathematical modeling become an integral part of immunological research. Almost in every theory of mathematics there exists its discrete counterpart which makes the theory easier to understand and easier to use in modeling process of the real world problems. Since the fractional derivative of a function depends on its whole time history, and not on its instantaneous behavior, they are perfectly suited for the tumor growth. In this talk, some basics of discrete fractional calculus will be developed. We use simplest discrete fractional calculus of variations problem and derive Euler-Lagrange equation. We introduce and solve Gompertz fractional difference equation for tumor growth models. [page 15]

Shockley, Heather See Batra, Sumit

Singh, Shalini "Racial Discrimination in Health Care Services among HIV-Infected Persons" (Dr. William Mkanta)

Racial and ethnic disparities found in access to health care are well discussed among HIV/AIDS infected adults & its prevalence is complex. It has been observed that access-related factors like insurance status, income level, cultural & spiritual belief & varied health systems contribute for lower access of health services utilization in minorities. Despite efforts at various levels of the government to address this problem, there is still a significant number of HIV/AIDS infected population experiencing the inequity, with reports from nationally representative studies showing that HIV-infected individuals belonging to minority populations have not been able to obtain some needed health care services. The purpose of presentation is to examine types of differences still reported regarding health services received by HIV-infected individuals. [page 13]

Tamarapu Parthasarathy, Prasanna "Isolation of a Bacteriophage for *Clostridium scatalogenes* ATCC 25775" (Dr. Kinchel Doerner)

3-Methyl Indole (3-MI) is one of the compounds responsible for malodours in food, animal production and waste. *Clostridium scatalogenes* is the most studied strain for the production of 3- MI. If, the factors that down regulate the production of 3-MI are known, additives may be used that can minimize the 3-MI production. To understand and elucidate the pathway for 3-MI production, we need a genetic modification system in *Cl. scatalogenes*. This system will allow generation of mutants defective in or regulation of 3-MI synthesis. Phages are useful tools within bacterial genetic systems. Currently a phage capable of infecting *Cl. scatalogenes* has not been identified. Upon isolation of phage, *Cl. scatalogenes* will be screened for 3- MI production. We tested 18 environmental samples for a phage that could infect *Cl. scatalogenes*. Prophage induction using Mitomycin-C did not yield any phage. Plaque assays and TEM also failed to indicate the presence of a phage. [page 15]

Truba, Natalie Prisbe "The Therapeutic Effects of a Specialized Summer Camp for Children Suffering from a Chronic Heart Condition" (Dr. Sarah Ostrowski)

The current study was designed to evaluate quality of life, self-efficacy and peer-comparisons in children and adolescents diagnosed with a chronic heart condition before and after a week of specialized summer camp. The campers completed the measures upon arriving at camp and on the last day of camp. Findings suggest non-significant changes from baseline to post-treatment with respect to campers' quality of life ($t(23)=1.40$, $p>.05$, $d=.068$), self-efficacy ($t(42)= .23$, $p>.05$, $d=.014$), and peer comparisons ($t(38)=.85$, $p>.05$, $d=.063$); however, post-hoc analyses revealed that, at post-treatment, male participants had higher mean scores on peer comparison ($p = .022$) and significantly lower means on the measure of self-efficacy ($p = .006$) than their female counterparts. Findings suggest that specialized summer camps may have a more positive effect on the male campers' perceived self-efficacy than females' perceived self-efficacy. [page 6]

Tsao, Wan-Ting and Lee, Yu-Ting "2010 ATMAE Presentation Proposal" (Dr. Mark Doggett)

Courses in photography design introduce the theory of photography, develop potential skills, and give realistic practices to increase the experiences. The involutes will use the basic skills of photography combined with their academic and program scholar to finish their works. A generic photography design course will be the foundational class; we focus on the people who are interested in photography and link up with current industry. Students will understand the development model used in academic

knowledge and in industry to completely restructure its generic photography design foundation course to reflect industry requirements. [page 9]

Tsao, Wan-Ting See Lee, Yu-Ting

Webb, Amanda "Sound Production in Two Loricariid Catfish Species" (Dr. Michael Smith)

Many families of catfish produce sounds via pectoral spine stridulation. The sound production capabilities and characteristics of the family Loricariidae have not been well studied. Sounds produced by two loricariid catfish species, *Otocinculus affinis* and *Pterygoplichthys gibbiceps* were recorded. Light and scanning electron microscopy were used to examine the pectoral spines from the largest and smallest fish from both species. Relationships between spine inter-ridge distance, pulse duration, and frequency will be discussed. [page 15]

West, Cassie See Aldridge, Jessica R.

William, Todd See Galbreath, William Adam

Wood, Matthew Vincent "Description of a New Genus (Coleoptera: Ptinidae) of Spider Beetle and Their Diversity in South Africa" (Dr. Keith Philips)

A new genus of spider beetle (Coleoptera:Ptinidae) from South Africa is presented. The genus can be distinguished by the distinct pattern of ridges on the elytra and the inflated setal tufts on the pronotum. An overview of the diversity of Southern African spider beetles is also presented, as well as a brief synopsis of their evolutionary history. [page 15]

Wright, Alice Ann and King, Rodney "Sequence of Bacteriophage HK239 and Comparative Genomic Analysis" (Dr. Rodney King)

Genes expressed from prophages have a variety of functions, including virulence and exclusion. We are interested in bacteriophage HK239 because it can exclude a wide range of phage including P2, P1vir, Lambda, HK022, T4rII, and φ80. In previous work, a clone that excluded HK022 was identified as a φ80 cor homolog. None of the screened clones excluded P2 or Lambda which suggests that multiple genes control superinfection exclusion in HK239 lysogens. To identify other candidate exclusion gene(s) and to further characterize the phage, we have sequenced and annotated the HK239 genome. We have compared the genome to other lambdoid phages and, as is common in this family, there is evidence of genetic mosaicism. No additional exclusion homologs have been identified. However, based on the genomic location of known exclusion genes in other phage, several candidate genes in HK239 have been identified as potentially encoding exclusion functions. [page 15]

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