

College of Education • College of Health Sciences and Human Services • College of Humanities and Fine Arts • College of Science, Engineering, and Technology • School of Agriculture • College of Business and Public Affairs

Murray State University

Scholars Week



A Celebration of Student
Research, Scholarship, and
Creative Work

April 16-20, 2007

6th Annual
Scholars Week
Program and Abstracts

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Welcome!

Welcome to *Scholars Week 2007*. This year marks the sixth anniversary of Murray State University's *Scholars Week* celebration and is an achievement of which we can all be proud.

This academic year has again been a very productive one for both our undergraduate and graduate students as well as our faculty. In February, Murray State undergraduate students joined students from Kentucky's seven other public institutions and the Kentucky Community and Technical College System at *Posters-at-the-Capitol*, an event in Frankfort organized by Murray State's Undergraduate Research and Scholarly Activity (URSA) office. Throughout the year, over thirty undergraduates at Murray State have received financial support for faculty-mentored projects through the URSA Grant Program. The third edition of *Chrysalis: The Murray State University Journal of Undergraduate Research* has been published and features the scholarly endeavors of students from across the campus. New to Murray State this year, the Research Scholar Fellowship Program, assisted by the Andreen Fund at the Council on Undergraduate Research, awarded seven fellowships to undergraduate in a close review that included more than twenty proposals. Finally, there is *Scholars Week*, the end-of-the-year celebration that recognizes the creative and scholarly work of hundreds of Murray State's undergraduate and graduate students.

I encourage you to attend as many of this year's *Scholars Week* oral and poster presentation sessions, performances and exhibits as possible. Your participation sends a clear signal that Murray State University understands and values the learning opportunities that our faculty provide.

I am grateful to you, our students and faculty, for making this another outstanding year of scholarly accomplishment at Murray State University.

Dr. Randy Dunn
President, Murray State University



Welcome!

Welcome to the 6th anniversary of *Scholars Week* at Murray State University. *Scholars Week* has become a very important event at Murray State University for our students and faculty. I have been extremely pleased to watch this program grow over the six-year period from approximately 200 students the first year to over 1000 students this year. This is truly a university-wide celebration of undergraduate and graduate research, scholarship, and creative activity.

I applaud the efforts of our Undergraduate Research and Scholarly Activities (URSA) office for implementing this program six years ago and then working with students and faculty to achieve greater and greater participation each year. During this week, students have the opportunity to showcase their scholarship efforts through oral presentations, poster sessions, exhibits, and performances.

I believe research, scholarship, and teaching go hand-in-hand to provide one of the very best learning environments for students. We know from current research in learning theory that students learn and retain knowledge better when they are fully engaged in the process. Through the efforts of our dedicated faculty, Murray State University is developing into one of Kentucky's institutions of choice *for students who want to engage in the process of discovery and do significant research and creative work as undergraduates.

I encourage all of you to take advantage of the activities of this week and enjoy!

Dr. Gary R. Brockway
Provost, Murray State University





There are no guarantees in life. We all have heard that. It's difficult to guarantee anything, especially a university's performance with regard to student learning, but there are some parameters: In the world of accountability in which we all live, critical components of student learning are obvious in courses completed, grades achieved, and ultimately graduation; however, another equally critical component of student learning is in research and scholarship during the undergraduate years. "Traditionally, undergraduate education has taken place in the classroom, while research has been for graduate students and faculty. No more. College and universities are pushing hard to get many more undergraduates involved in research" (Justin Pope, Associate Press, USA Today, Feb. 5, 2007). This very current article goes on..."Nationally, there is nothing hotter than

undergraduate research," says George Barthalmus, NC State's director of undergraduate research.

As an NC State alumnus, I echo Dr. Barthalmus' comments, and I am very proud, as a Murray State University faculty member and administrator to share with you that your education here, with tremendous faculty/staff interaction, has been exponentially "ramped up" with regard to undergraduate research under the leadership of Dr. John Mateja in the Undergraduate Research and Scholarly Activity Office. You should be proud of your engagement in scholarship and research during our annual *Scholar's Week*, working hand-in-hand with professors across all of our colleges, departments, and disciplines. I am very proud to welcome you to this cutting edge event where Murray State University is an equal peer to some of the best research universities in the nation.

There are no guarantees in life, and student learning is difficult to measure; however, your participation in Murray State University's *Scholar's Week* is evidence of your success here as a student as well as your success in the not-too-distant-future as a graduate. Don't forget your beginnings, and always remember your alma matre, Murray State University, Kentucky's Public Ivy University and a leading comprehensive university in the nation.

Dr. Tim Todd
Interim Dean, College of Business and Public Affairs



Scholars Week is a rewarding and exciting event for the College of Education and Murray State University. During the year we celebrate student contributions and achievements in many domains but during *Scholars Week* the academic work and achievement is displayed by our most accomplished students. The display of academic work and achievement reflects our institution and gives our community and citizens of the Commonwealth insight to the true meaning of our institution.

Students from each college within the university have prepared exhibits and presentations that reflect their academic endeavors. I encourage you to visit all of the displays and personally congratulate the scholars for their outstanding work and achievement.

As Dean of the College of Education, I welcome you to *Scholars Week* and trust you will be impressed with the displays and the hospitality and friendliness of our students, faculty, college and university.

Dr. Russ Wall
Dean, College of Education



Murray State University's *Scholars Week* provides an exciting opportunity to recognize and celebrate the academic achievements of our undergraduate and graduate students, showcasing the results of their scholarly and creative projects. Research, fundamental and applied, is an essential component of our curricula. Throughout history, major discoveries and new knowledge have been essential to human progress. Through active research agendas and creative endeavors, our faculty and students explore the boundaries of their disciplines and expand our realm of possibilities.

Discovery through research and creative activity encourages a sense of relevance and excitement as new knowledge is applied to society, industry, and beyond. The faculty in the College of Humanities and Fine Arts work together with their students on research and creative projects in classrooms, clinics, and studios, becoming partners in the exploration of disciplines and the acquisition of new knowledge. This partnership expands the abilities of our students to think independently, creatively, and critically. As one of the leading universities in the region, this is our ultimate mission.

Dr. Ted Brown
Dean, College of Humanities and Fine Arts



Scholars Week is a celebration of the unique relationship between students and faculty as they join together to address problems in creative and scientific ways. Collaboration in the research process provides an opportunity for personal and professional growth for both students and faculty that few other activities afford. The College of Health Sciences and Human Services along with the rest of Murray State is committed to continued exploration and to the importance of including undergraduates as well as graduate students in this exciting process. This event celebrates the product of these collaborations as well as the process. As you examine these exhibits, join us in appreciation of the diversity of intellectual

and creative activity going on at Murray State University.

Dr. Elizabeth Blodgett
Dean, College of Health Sciences and Human Service



The primary goal of Murray State University’s faculty and staff is to “foster student-centered learning and development.” Central to the mission statement of Murray State is a strong commitment to recruit and retain highly credentialed professionals, deeply involved in the intellectual development of students. During MSU *Scholars Week*, we celebrate the research, scholarship, and creative accomplishments of our students – testimony of the strength and dedication of students and faculty toward the enterprise of learning. May we see in this week an image of an even greater commitment to a lifetime of scholarly contribution to society.

Dr. Neil V. Weber
Dean, College of Science, Engineering, and Technology



On behalf of the School of Agriculture, I would like to welcome you to this unique opportunity to celebrate research, scholarly, and creative activity. It is also a time to showcase our dedicated faculty who are devoted to personal and professional growth. Life is a journey with many avenues. As you participate in this event, you will view the numerous ways the University is committed to academic excellence as well as providing the opportunity to explore these avenues. Through activities like *Scholars Week*, Murray State University and the Murray State University School of Agriculture offers its students the opportunity to get an education instead of just a degree. I would like to commend all the participants in this event.

Dr. Tony Brannon
Dean, School of Agriculture

A Welcome from the Undergraduate Research and Scholarly Activity Advisory Board and Staff

On behalf of the URSA Advisory Board and the URSA Office, welcome to our sixth annual *Scholars Week* celebration. We are pleased that over the past six years that several thousand Murray State University undergraduates and graduate students have had the opportunity to present their research, scholarly, and creative works to the university community.



The work displayed in this year's *Scholars Week* abstract booklet represents thousands of hours of effort on behalf of Murray State's students and faculty. To our students, you are to be commended for your dedication and effort! Your efforts will be rewarded when you apply to graduate school or when you look for that first job. To the faculty, you are helping our students succeed and this is among our greatest rewards.

Please join the URSA Advisory Board and the URSA staff in celebrating the accomplishments of our students by attending as many of the *Scholars Week* events as possible. Our young scholars need your continued support!

URSA Advisory Board:

Pictured (standing left to right, 1st picture): Dwight Holliday, ZB Smetana, Pat Williams, and David Ferguson. Seated: Marcia Hobbs, Adam Murray, and Paula Waddill. Pictured (2nd picture): John Mateja and Tracey Wortham. Not Picture: David Eaton, Harry Fannin, Terry Holmes, Joyce Shatzer, and Howard Whiteman.

Advisory Board and Staff:

Dr. Howard Whiteman
Biological Science

Dr. Tracey Wortham
Occupational Safety and Health

Dr. Zbynek Smetana
Art

Dr. Dwight "Doc" Holliday
Education

Dr. Joyce Shatzer
Education

Dr. Paula Waddill
Psychology

Dr. Terry Holmes
Business Administration

Dr. David Eaton
Economics and Finance

Dr. David Ferguson
Agriculture

Dr. Pat Williams
Agriculture

Dr. Marcia Hobbs
Nursing

Dr. Harry Fannin
Chemistry

Mr. Adam Murray
Library

Dr. John Mateja
Director, URSA / McNair

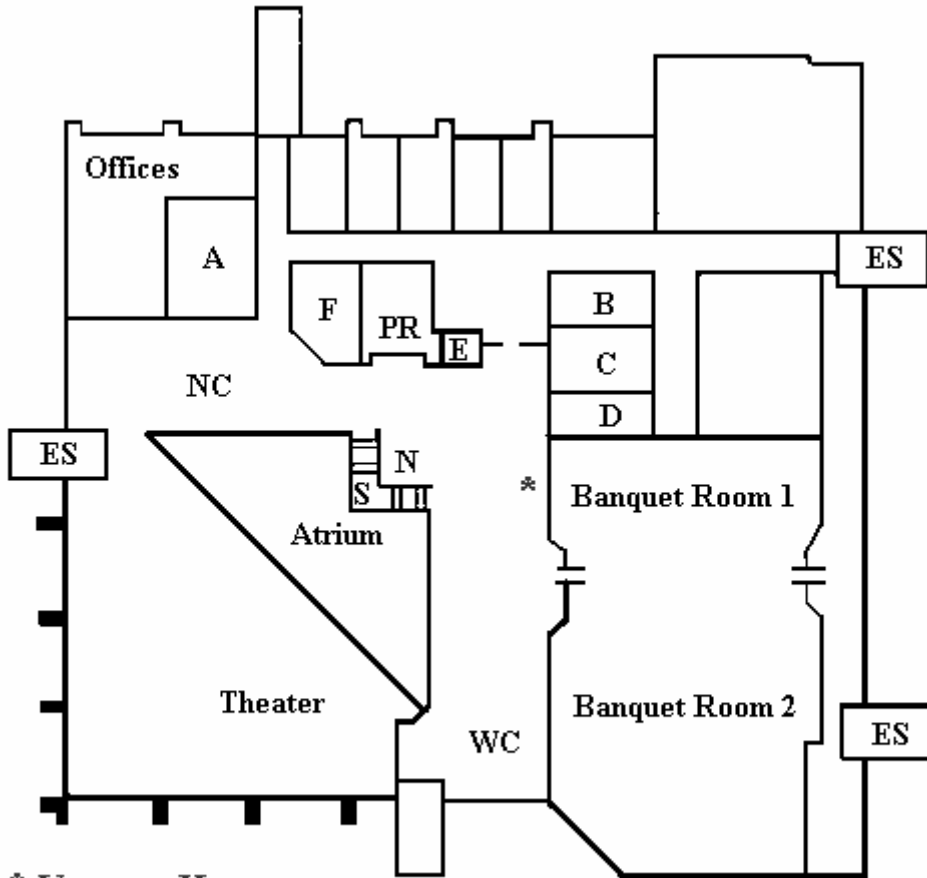
Mr. Jody Cofer
URSA / McNair



Murray State University

Scholars Week

April 16 - 20, 2007



* You are Here

- A – Barkley Room
- B – Ohio Room
- C – Mississippi Room
- D – Cumberland Room
- S – Center Stairs
- NC – North Concourse

- E – Elevator
- F – Tennessee Room
- N – Crow's Nest
- PR – Public Restrooms
- ES – Emergency Stairs
- WC – West Concourse

Scholars Week Program

Monday, April 16, 2007

Poster Session

Sigma Xi Poster Competition

Small Ballroom, Curris Center

Session Chair: Dr. Mike Kemp

9:00 a.m. – 12:00 p.m. Poster Set-Up

12:00 p.m. – 4:00 p.m. Poster Judging

Melissa Addressi – Engineering Physics
and Sara Evans – Applied Physics
*Camcorder Astronomy: Measurement of
Seeing Quality*

Brent Arnold – Geosciences
*An Analysis of Impact of a Residential
Suburb on a Watershed Using Remotely
Sensed Data*

Erin Cathcart – Horticulture
*Short Term Effects of Worm Casting By-
Products on Whitefly Reduction and
Germination Rates in Greenhouse
Production*

Colin Corbett – Chemistry
*Biochemical Assays for
Methyltransferase Enzymes on a
Microfluidic Platform*

Rebecca Cripps – Biology
*Comparison of Nitrogen Isotopic
Signatures of Bluegill from Kentucky
Lake and Ledbetter Creek*

Tyler Downing, Zac Elmore, and Cole
Phelps – Biology
*Enzymatic Activities of Renal H⁺K⁺-
ATPase in Hyperglycemic Mice*

Julia Earl – Water Science
*Lethal and Sublethal Effects of Nutrient
Pollution on Amphibians*

Annette Fowler – Chemistry
*Trace Level Analysis of PBDEs in Fish
Tissue Extracts Using GC-ECD*

Ashley Hagan, Nicole Gerlanc, & Todd
Schoborg – Mathematics and Biology
*Microsatellite Analysis of a Polymorphic
Population of Tiger Salamanders,
*Ambystoma tigrinum**

Holly Mowery – Chemistry and Biology
*Sodium and Potassium Concentrations
in Murray Wastewater Treatment Plant
Samples*

Shane Newborn – Biology/Pre-Med,
Zachary Brain and Komal Patel –
Biology/Pre-Dental, Courtney Harris –
Biology/Pre-Optometry, and Kelly
Harris – Biology/Conservation
*Uncovering the Mechanism of Plant
Invasion by Employing a Comparative
Biophysical Traits Study of Exotic
(*Lonicera Japonica*) and Native
(*Lonicera Sempervirens*)*

Suresh Nune – Chemistry
*Polychlorinated Biphenyls (PCBs),
Chlorinated Pesticides and
Polbrominated Diphenyl Ethers
(PBDEs) in Sediment, Mussel Tissue and
Fish from Kentucky Lake*

Michael O'Brien – Biology
*Blood and Intestinal Parasite of Tiger
Salamanders (*Ambystoma tigrinum
nebulosum*) Based on Life Phase*

Jennifer Parrish-Lamb – Geoscience
A Comparison of Two Historic Church Sites in Land Between the Lakes (LBL) Through Multi-Date Composite Change Detection

Maria Phillips – Chemistry, and Holly Mowery – Chemistry and Pre-Medical
Occurrence of Pharmaceutical Chemical Residues in Murray Waste Water Treatment Plant Samples

James Ramsey – Biology
Lifecycle, Distribution, and Secondary Production of Hexagenia bilineata (Say) in Ledbetter Embayment of Kentucky Lake, Kentucky

Amanda Rosewell – Biomedical Sciences
Progesterone Anti-Sense Oligonucleotide Infusion in the Anteroventral Periventricular Nucleus Downregulates Progesterone Receptors

Sarah Sharp – Archaeological Information Systems
Detection of Patterns of Past Occupation of an Archaeological Site Using Spatial Feature Manipulation Techniques

Cynthia Shaw and Evan Roberts – Chemistry
The Low-Barrier Double-Well Potential in Bound HIV Protease Systems and Small Analogs

Whitney Shirley – Agribusiness, Brittany Collins – Agricultural Science, and David Crouch – Agronomy
Comparison of Residual Herbicide Programs for Dark-Fired Tobacco

Courtney Snapp – Water Science
Diatom Colonization Patterns in Springs at Land Between the Lakes National Recreation Area, Western Kentucky and Tennessee

David Sohn – Geosciences
Detecting Temporal Changes in Mountain Glaciers Using Remote Sensing and GIS

Kaleb Tapp and Brian Craig – Agricultural Systems Technology, and Magen Roberts – Agribusiness
Comparing Nitrogen Rates in Dark Tobacco

Courtney Thomason – Wildlife/Zoological Conservation and Tiffany Hedrick – Biology and English
Stressors Associated with Anthropogenic Disturbance Affect Humoral and Cell-Mediated Immunity in White-Footed Mice (Peromyscus leucopus)

Oral Sessions

Economics Session

Mississippi Room, Curris Center
Session Chair: Dr. David Eaton
1:30 p.m. – 4:00 p.m.

Sarah Baker – Economics
The Future of the U.S. Labor Market: What will be the Effect of the Exit of Baby Boomers and Entrance of Generation Y

Todd Broker – Economics
Risky Business: A Look at Individual Decisions of Risk and Uncertainty

Dianna Conner – Economics
Subprime Lending and Housing Market Values: Is there a relationship?

Chase Fisher – Economics and Political Science
The Casino Effect: Identifying the Social Costs Imposed by Casinos

Sam Jackson – Economics
Economics of Ticket Scalping and Regulation

Jennifer Lacewell, Ugur Oner, Michael Schoell, and Chase Venable – Business Administration
The Demand for a Murray State University Education

Mikala Trapani – Economics
Review of Literature on Charitable Giving: The Difference Between Donating and Purchasing

BioMaps Mini-Symposium

Ohio Room, Curris Center
Session Chair: Dr. Renee Fister
2:00 p.m. – 3:30 p.m.

Craig Collins – Mathematics
Optimal Control of Mixed Immunotherapy and Chemotherapy of Tumors

Ashley Hagan, Nicole Gerlanc, and Todd Schoborg – Mathematics and Biology
*Microsatellite Analysis of a Polymorphic Population of Tiger Salamanders, *Ambystoma tigrinum**

Tiffany Hedrick – Biology/English, and Courtney Thomason – Wildlife/Zoological Conservation
*Of Mice and Men: The Effects of Anthropogenic Disturbance on *Peromyscus leucopus**

Celebration of Mentoring

Faculty Club
3:00 p.m. – 4:30 p.m.

Remarks by Dr. Terry Derting, Department of Biological Sciences, and Dr. Paula Waddill, Department of Psychology, as the 2006-07 University Distinguished Mentor Award Recipients Faculty and Staff Welcome!

Exploring Multi-Faceted Effects of Globalization: Studies of Tensions Between Economic, Cultural, and Social Impacts

Barkley Room, Curris Center
Session Chair: Dr. Michael Basile
3:00 p.m. – 4:30 p.m.

Jeffrey Lester – Political Science
The Long Road: WTO Requirements a Step Forward for the Rule of Law in China

Adam Moore – International Affairs
The Great Arab Failure: Can Pan-Arabism Ever Succeed

Tracy Nearhoof – International Affairs
The World Bank and Morocco: Will a Standard Policy Work?

Denisha Robinson – International Affairs
A Dark Side of Globalization: A Comparative Case Study of International Sex Trafficking

Melanie Shepard – German
Is AIDS Prevention in Africa Successful?

Mitchell Thomas – Finance
The Effects of Globalization on the United States Giants: A Case Study of the General Motors Corporation

Georgena Ware – Theatre
He Said – She Said: A Look into the Arguments Concerning Turkey’s Entrance into the European Union

Honors Program Senior Thesis Presentations

Barkley Room, Curris Center
Session Chair: Dr. Mark Malinauskas
4:30 p.m. – 6:15 p.m.

Charissa Acree – Journalism and Spanish
Los Medios: The Hispanic Populations Influence on Print Media

Erin Bogle – Middle School Education
Middle School Education Portfolio

Emily Detrick – Art, Ceramics
Fallible Bodies: BFA Exhibition of Drawings and Ceramics

Lauren Hines – Liberal Arts/Spanish
The French Electoral Process and the 2007 Presidential Election

Christopher Hopper – English
The Second Life of Learning: Exploring the Use of Multi-User Virtual Environments for Higher Education

Emmy Lou Kacer – Spanish
Charismatic Reformation: The Spiritual Re-conquest of Latin America

Adam Moore – International Affairs
The Great Arab Failure: Can Pan-Arabism Ever Succeed?

Tuesday, April 17, 2007

Oral Sessions

Behavioral and Social Sciences Session

Ohio Room, Curris Center
Session Chair: Dr. Paula Waddill
1:30 p.m. – 2:30 p.m.

Ebone` Hatcher – Psychology
Applying the Material Appropriate Processing Framework to Learning Through Video and Text

Marilyn Kennon – Sociology
Wasting Away... Underground

David Solomon - Psychology
Divided Attention Increases Negativity Bias

Heather Stroupe – Psychology
Job Expectations Among College Students

Modern Language Senior Colloquium

Barkley Room, Curris Center
Session Chair: Dr. Meg Brown
2:00 p.m. – 5:00 p.m.

KIIS/Cinema International Essay Scholarship Winners

Cassidy Norvell - English Education and Spanish Education
The Mania-Agape Love Dynamic as a Universal Issue in “Take My Eyes”

Ryan Leach – Psychology
The Dehumanizing Effects of Prejudice and its Cultural Implications

Erin Kelly – French
Teen Pregnancy in France and the United States

Jenny Naes – French
*French Intellectuals During WWII:
From Pacifism to Activism*

Philadelphia Bruss – German
Jews in New Films about World War II

Rachel Scott – German with Teacher
Certification
*The Influence of Turn of the Century
Vienna on the Art of Gustav Klimt und
Egon Schiele*

Bradley Diggs – German & Economics
*Bertolt Brecht and Gerhart Hauptmann -
A Social, Political, and Economic
Comparison Between “Die Heilige
Johanna der Schlachthöfe” and “Die
Weber”*

Cassidy Norvell – English Education
and Spanish Education
*“The House on Mango Street”: Blurring
the Border*

Autumn Starks – Spanish
The Message of “Estacion Inmovil”

Noé Madrigal - Spanish
*Lope de Vega: Poems That Reflect His
Life*

Kelly Jane Rottman - Spanish
*Lorca, A Spokesman for the Gypsies
through the Development of the Theory
of Duende*

Sigma Xi Colloquium – Open to the Community

The Evolution of Goodness
by Lee Dugatkin

Sponsored by Sigma Xi and the College
of Science, Engineering and Technology
Freed Curd Auditorium, Collins Ctr.

Session Chair: Dr. John Mateja
3:00 p.m. – 4:00 p.m.

Book Signing

Author: Lee Dugatkin
Crows Nest, Curris Center
4:00 p.m. – 5:00 p.m.

Honors Program Senior

Thesis Presentations

Mississippi Room, Curris Center
Session Chair: Dr. Mark Malinauskas
4:30 p.m. – 6:15 p.m.

Erin Black – Mathematics
Styrofoam Recycling Initiative
Elizabeth Cawein – Journalism
*Reading Between the (Bar) Lines: The
Social and Cultural Impact of Music
Journalism*

Phillip Dishon – Electronic Media
Television
*Being Brakhage: An Exploration of
Independent Film Production*

Jason Hinson – Political Science
*A Matter of Interpretation: The United
States and International Law*

Rachael Jaenichen – Public Relations
and Organizational Communication
*What is the Relationship Among
Wedding Planning, Gender
Communication, and Conflict
Management*

Katie Marks – Psychology
*The Adversarial Assumption of Law and
Psychology*

Eric Wilson – Electro Mechanical
Engineering
*Monitoring Water Levels in Personal
Hydration Systems*

Sigma Xi Banquet

Large Ballroom
6:30 p.m. – 8:30 p.m.

Performance

Performing Arts Hall
6:30 p.m.

String Chamber Music Recital

Director: Sue-Jean Park
Assisted by: Matthew Butterfield

Da-ye Choi	Andrew Miller
Mary Choukalas	Samantha Miller
James Dill	Holly Pritchard
Marilyn Freezor	Nickolas Schulz
Nikki Fuller	Gracie Wallace
Sarah Horn	Julia Watkins
Blair Joseph	Andy Webber
Sarah Lee	Elizabeth Whitsett
Matthew Mazzonie (faculty)	
Sue-Jean Park (faculty)	

Performing Arts Hall
8:00 p.m.

Woodwind Chamber Music Recital

Director: Mr. Scott Erickson

Joseph Alexander	Andrew Lundy
Alex Bruner	Joel Roberts
Josh Byrne	Marshall Shank
Devon Caton	Heather Waters
James Kyle Damron	Chris Watson
Rachel Deren	Tim Zeiss
Cassie Fischer-Flaherty	

Wednesday, April 18, 2007

Poster Session

General Session

Small Ballroom, Curris Center
9:00 a.m. – 11:30 a.m.

** Students will be with their posters from 10:30 a.m. to 11:30 a.m.*

*** Sigma Xi Poster Competition*

Participant

**** American Humanics or Service Learning Posters*

1. Cassie Abbott, Katie Adams, Brittanie Ainslie, Yvonne Anderson, Leah Barker, Amanda Barnt, Amanda Cerny, Betty Cleaver, Kathleen Dixon, Andrea Elliott, Nathan Futrell, Megan George, Dameca Jerman, Toshiharu Kikuchi, Jacinda Lewis, Anita Long, Kelly Lynch, Amie Miller, Leigh Nason, Cowann Owens, Laura Schroeder, Laura Shreve, Wayne Simpson, Patricia Siza, and Chelsie Zeigler ***

Virtual Agency Collaboration with a Local State Agency

2. Melissa Addressi – Engineering Physics and Sara Evans – Applied Physics **

Camcorder Astronomy: Measurement of Seeing Quality

3. Sherri Anderson, Dennis Carbrough, and Rachel English ***

United Way Community Survey

4. Brent Arnold – Geosciences **
An Analysis of Impact of a Residential Suburb on a Watershed Using Remotely Sensed Data

5. Chad Ashby – Business Administration ***
Ping Pong Tournament

6. Megan Bivens, Erin Gray, and Nathan Marshall ***
"It's My Very Own" Bags of Love
7. Clay Boyd, Sabrina Johnson, and Amber Roach ***
The Party
8. Jessica Bruner – Psychology
Intercollegiate Athletics and Disordered Eating
9. Whitney Bush, Michael Dennis, and McKinzey Hodge ***
Food for Friends
10. Amy Carter, Michael Dennis, and Jamie Jones ***
Needline Blanket Drive
11. Kelley Carter – Communication Disorders ***
Shoot the Moon with High Nine: A Service Learning Program
12. Erin Cathcart – Horticulture **
Short Term Effects of Worm Casting By-Products on Whitefly Reduction and Germination Rates in Greenhouse Production
13. Kara Clark, Josh Dunn, Ben Henke, Janel McGill, and Jenny Smith ***
Great American Smoke-Out
14. Ross Clark, John Gorrell, and Allie Hunt ***
Pet University
15. Courtney Cook and Andy Dukes ***
Angel Attic Newsletter
16. Colin Corbett – Chemistry **
Biochemical Assays for Methyltransferase Enzymes on a Microfluidic Platform
17. Rebecca Cripps – Biology **
Comparison of Nitrogen Isotopic Signatures of Bluegill from Kentucky Lake and Ledbetter Creek
18. Natalie Cunningham and Jessica Weatherford ***
Worship Together
19. Karen Delandy, Whitney Fowler, and Jacqueline Jordan ***
Humane Society of Calloway County
20. Jonathan DeMarie – Psychology
Joint Mobilization Just Loosen Up
21. Tyler Downing, Zac Elmore, and Cole Phelps – Biology **
Enzymatic Activities of Renal H⁺K⁺-ATPase in Hyperglycemic Mice
22. Julia Earl – Water Science **
Lethal and Sublethal Effects of Nutrient Pollution on Amphibians
23. Kelli Eckdahl and Michael Stranger ***
Bags of Love

24. Carrie Elliott – Agricultural Education, Justin Parrish – Agriculture Science, and Chris Rodgers – Agronomy
Comparison of De-Topping Methods for Dark-Fired Tobacco with Three Different Bloom Stages and Two Different Heights
25. Rachel English – Outdoor Recreation ***
Powder Puff Pool Tournament: A Service Learning Program
26. Amanda Enochs, Bethany Powell, and Greg Widelski ***
Pet University
27. Annette Fowler – Chemistry **
Trace Level Analysis of PBDEs in Fish Tissue Extracts Using GC-ECD
28. Ashley Hagan, Nicole Gerlanc, & Todd Schoborg – Mathematics and Biology **
*Microsatellite Analysis of a Polymorphic Population of Tiger Salamanders, *Ambystoma tigrinum**
29. Myshayla Herron and Nathan Moore ***
Clothing the Community
30. Kim Hill, Brittany Shemwell, and Brian Stutler ***
Pet University
31. Daniel Hughes – Organizational Communication ***
All Shuffle Aboard: A Service Learning Program
32. Chungen (Lester) Hung
Web 2.0
33. Mandy Laszenski and Shaina Slowaik ***
The Party
34. Jonathan Lewzader – Chemistry and Pre-Pharmacy
Development of New Synthetic Strategies for the Synthesis of N-heterocyclic Scaffolds
35. Jessica Lindley – Pre-Veterinarian
The In Vitro Binding Effectiveness of Selected Pathogens Using Phyllosilicate Clays
36. Stefanie Long – Exercise Science, Wellness
Diabetes and Exercise
37. Dana Manley – Nursing
Increasing Physical Activity in Middle School Students: A Pedometer Project
38. Holly Mowery – Chemistry and Biology **
Sodium and Potassium Concentrations in Murray Wastewater Treatment Plant Samples
39. Shane Newborn – Biology/Pre-Med, Zachary Brain and Komal Patel – Biology/Pre-Dental, Courtney Harris – Biology/Pre-Optometry, and Kelly Harris – Biology/Conservation **
*Uncovering the Mechanism of Plant Invasion by Employing a Comparative Biophysical Traits Study of Exotic (*Lonicera Japonica*) and Native (*Lonicera Sempervirens*) Honeysuckle Species*

40. Suresh Nune – Chemistry **
Polychlorinated Biphenyls (PCBs), Chlorinated Pesticides and Polbrominated Diphenyl Ethers (PBDEs) in Sediment, Mussel Tissue and Fish from Kentucky Lake
41. Michael O'Brien – Biology **
*Blood and Intestinal Parasite of Tiger Salamanders (*Ambystoma tigrinum nebulosum*) Based on Life Phase*
42. Jennifer Parrish-Lamb – Geoscience **
A Comparison of Two Historic Church Sites in Land Between the Lakes (LBL) Through Multi-Date Composite Change Detection
43. Tara Pool – Psychology
Rival Salience and Sport Team Identification
44. Bethany Powell – Outdoor Recreation ***
Eating Right and Being Healthy: A Service Learning Program
45. Maria Phillips – Chemistry, and Holly Mowery – Chemistry and Pre-Medical **
Occurrence of Pharmaceutical Chemical Residues in Murray Waste Water Treatment Plant Samples
46. James Ramsey – Biology **
*Lifecycle, Distribution, and Secondary Production of *Hexagenia bilineata* (Say) in Ledbetter Embayment of Kentucky Lake, Kentucky*
47. Amanda Rosewell – Biomedical Sciences **
Progesterone Anti-Sense Oligonucleotide Infusion in the Anteroventral Periventricular Nucleus Downregulates Progesterone Receptors
48. Sarah Sharp – Archaeological Information Systems **
Detection of Patterns of Past Occupation of an Archaeological Site Using Spatial Feature Manipulation Techniques
49. Cynthia Shaw – Chemistry **
The Low-Barrier Double-Well Potential in Bound HIV Protease Systems and Small Analogs
50. Whitney Shirley – Agribusiness, Brittany Collins – Agricultural Science, and David Crouch – Agronomy **
Comparison of Residual Herbicide Programs for Dark-Fired Tobacco
51. Courtney Snapp – Water Science **
Diatom Colonization Patterns in Springs at Land Between the Lakes National Recreation Area, Western Kentucky and Tennessee
52. David Sohn – Geosciences **
Detecting Temporal Changes in Mountain Glaciers Using Remote Sensing and GIS
53. Melinda Streetman – Outdoor Recreation ***
Share a Seed, Watch it Grow: An Intergenerational Program

54. Kaleb Tapp and Brian Craig –
Agricultural Systems
Technology, and Magen Roberts
– Agribusiness **
*Comparing Nitrogen Rates in
Dark Tobacco*
55. Courtney Thomason –
Wildlife/Zoological
Conservation, Tiffany Hedrick –
Biology/English **
*Stressors Associated with
Anthropogenic Disturbance
Affect Humoral and Cell-
mediated Immunity in White-
footed Mice (Peromyscus
leucopus)*
56. Joy Toler ***
Prevention of Domestic Violence
57. Christopher Totty – Computer
Science
*Malware Detection Software for
Microsoft Windows - Home
Again*
58. Stephanie Totty – Computer
Information Systems
The Capability Maturity Model
59. Andrew West – Wildlife Biology
*Susceptibility of Arboreal
Termites, Nasituterme acajutlae,
with Relationship of Environment*

~~Numerous posters from the American
Humanics program are not listed
individual in the program, but will be
displayed in the session.

**President's
Scholars Week Luncheon**

Large Ballroom, Curris Center
Moderator: Dr. Gary Brockway
11:30 a.m. – 1:00 p.m.

President's Welcome:
Dr. Randy Dunn

Demonstration by the
**MSU Electro-Acoustic Recital Series
(E.A.R.S.) Program**
Director: Dr. John Steffa

Lindsey Jacob and Alexander Grimm

Recognition of:

1. MSU Alumni Associations
Distinguished Researcher Award
Recipient
Introduction: Dr. Ramesh Gupta
Recognition: Dr. Randy Dunn
2. MSU Distinguished Mentor(s)
Introduction: Dr. ZB Smetana
Recognition: Dr. Randy Dunn
3. Grady Cantrell Award Recipient
and the Sigma Xi Competition
Award Recipients
Presenter: Dr. John Mateja
4. URSA Research Scholar
Fellowship Recipients
Presenter: Dr. John Mateja
5. MSU Freshman Writing
Experience Competition Winners
Presenter: Dr. Staci Stone

**MSU Alumni Association
Distinguished Researcher Award
Colloquium**

Curris Center Theater, Curris Center
Session Chair: Dr. Dan Wann
1:30 p.m. – 2:30 p.m.

Dr. Ramesh Gupta, Professor in the
School of Agriculture and 2006-2007
Distinguished Researcher Recipient
*The Brain as a Target of Disease and
Chemical Poisoning*

Oral Sessions

**College of Education: Student
Teacher Eligibility Portfolios**

Crows Nest, Curris Center
Session Chair: Dr. Jeanie Robertson
9:30 a.m. – 1:30 p.m.

**Field Biology Service Learning
Symposium**

Barkley Room, Curris Center
Session Chair: Dr. Howard Whiteman
9:30 a.m. – 11:20 a.m.

Hope Browning – Special Education,
Stephanie Henderson – Elementary
Education, and Rebecca Schweiker –
Education
Road Kill Survey

Katherine Drennon and Jessica Jones –
Biology for Secondary Education
*Raising Awareness of Conservation and
Preservation of the Wild Turkey*

Brian Flowers, Holly Fuqua, and Kellye
Smiley – Elementary Education
Plants and Animals

Antonio Frank Irby – Elementary Education
The Fishing and Canoeing Ability of Local Named Waterways

Melissa Underwood and Jennifer Jatzak – Elementary Education
The Natural History of Land Between the Lakes

Warren Van Wyck – Biology
Local Waterways and Their Primary Functions

Occupational Safety and Health Session

Mississippi Room, Curris Center
Session Chair: Dr. Tracey Wortham
9:30 a.m. – 10:30 a.m.

Jay Braffett, Bradley Jones, and Steve Ramage – Occupational Safety and Health
Pogue Library Floor Tests

Janelle DeCoursey and Melissa Seay – Occupational Safety and Health
Seatbelt and Crosswalk Surveys

Lucas Miller, Eric King, and John Shelby – Occupational Safety and Health
Ergonomic Review of Seat-Pan Manufacturing

Honors Seminar in Science Symposium

Barkley Room, Curris Center
Session Chair: Dr. Howard Whiteman
1:30 p.m. – 5:20 p.m.

Laura Allard – Economics and Nicole Fontanette – Pre-Veterinarian
Man's Best Friend: At What Price

Meg Black – English Education
The Importance of Prenatal Care

Stephen Boh – Biology and Mitchell Thomas – Economics and Finance
The Future of Weapons Technology

Julia Buckman – Management/Human Resources
Alzheimer's Disease and Its Impact

Emily Detrick – Art, Ceramics and Rebekah Clay – Undeclared
The Science of Glass: History, Uses, and Technologies

Phillip Dishon – Electronic Media Television
High Definition Television: The Expense of Broadcasting Development

Sarah Farmer – Mathematics, Secondary Education and Dustin Smith – History
Atrocities in the Name of Science

Stephanie Galla – Wildlife Biology, and Steven Taylor – Sociology
Star Wars Technology: Far-Flung Fantasy, or Reality?

Meagan Hensley – Liberal Arts and Kayla Reno – History
Historic Preservation

Lauren Hines – Liberal Arts/Spanish and Adam Moore – International Affairs
A Comparison of the Use of Alternative Fuels in the United States and Worldwide

Tara Radke – Elementary Education, and Jacob Hornbeak – Literature and Creative Writing
The Scientific Life of Water

Warren Robinson – Journalism and Spanish, and Alana Seaborg – English and Spanish

Expanding Borders: The Future of Space Exploration

Kyle Smith – Journalism, and Lacey Sparks - History

The Impact of Culture on Scientific Discovery

Kristen Watson – Elementary Education, and Lyndi Keel – Organizational Communication

Alleviating Emergencies in Africa through Science and Technology

Biology Session

Mississippi Room, Curris Center
Session Chair: Dr. Suguru Nakamura
2:30 – 3:00 p.m.

Stephanie Galla and Paul Gradie – Biology

Taxonomic Status of Large-Leafed Mulberry in Western Kentucky

Monica Morrison – Biology and Chemistry and Brad Medling – Biology
The Distribution of Renal H+K+ATPase in OMCD of Wildtype Mouse Model as Shown by Immunocytochemical Staining

Humanities Symposium

Mississippi Room, Curris Center
Session Chair: Dr. Ann Beck
3:30 – 4:45 p.m.

Nathanial Blaine Luffman - History
Concrete Jungle: The Jamaican Struggle with Independence (1962-1986)

Tyler Parrott – Political Science
Unfit for Command: How Candidate Image Kept Kerry Out of the White House

Teresa Ray – Journalism

Paradise Friendly Home Revisited

Tammy South – Independent Studies
An Archaeological and Historical Study of the Paris Landing State Park Bradford Cemetery

“Day Only of the 428-eron” Session

Rocking Chair Lounge, Curris Center
Session Chair: Dr. Barbara Cobb
3:30 – 4:00 p.m.

Laura Holt and others – English
Day Only of the 428-eron: After the Style of the Decameron and Heptameron

Thursday, April 19, 2007

Poster Session



“Patters of Distinction” Forum Organized by the Center for Telecommunications Systems Management

Sponsored by the TN Valley Authority Theater, Curris Center
Day Long Event, 8:30 a.m. Beginning

Presentations by TSM Undergraduate and Graduate Students

Guest speakers to include:
Hilda Legg, Former Administrator of the Rural Utilities Service

Jim Keiffer, Senior Vice
President of Marketing,
Tennessee Valley Authority

Robert Baldwin, Sales Center
Vice President-Signature Client
Group, AT&T

TSM Awards Luncheon

Open to Participating Students/Faculty
Ballroom, Curris Center
12:00 p.m.

Oral Sessions

Modern Language Senior Colloquium

Barkley Room, Curris Center
Session Chair: Dr. Meg Brown
2:00 p.m. – 5:00 p.m.

Patrick Hopp - Spanish and German with
Secondary Teacher Certification
*Attempting to Defy Death; A
Comparison of "Der Gevatter Tod" and
"Macario"*

Audrey Ferguson - English Education
and Spanish
*The Roles of the Abuser and the Abused
as Identified by Paz in the Mexican
Identity*

Lauren Hines - Liberal Arts and Spanish
*The Decline of Bullfighting in the 20th
and 21st Centuries*

Chelsea Vandiver - Spanish with
Teacher Certification
Themes of "La Dama del Alba"

Emmy Lou Kacer - Spanish
*Gabriela Mistral's "Tala" as a Book of
Intersections*

Niaz Khadem - Spanish Education
*"Versos Sencillos" as Transition Poetry
Between Romanticism and Modernism*

Charissa Acree- Journalism and Spanish
*The Media and Cuba: An Analysis of the
Influence of Communism on the Media
of Cuba*

Harry Lee Waterfield

Distinguished Lecture Series

"A Distant Light: A Journey to Racial
Justice in Kentucky" by Kentucky
Supreme Court Justice Bill Cunningham
Curris Center Theater, Curris Center
7:30 p.m.

Performance

Auditorium, Lovett
8:00 p.m.

Provost's Concert

Director: Mr. Dennis Johnson

Billy Arnold	Matthew Morris
Jessica Arnold	Greg Neff
Megg Berry	Chelsea Negray
Norman Blakely	Joel Roberts
Chad Bugbee	Stacy Rotterman
Chris Buis	Shaun Saulsberry
Devan Caton	Dannielle Schoenfeld
Josh Cole	Marshall Shank
Paul Davis	Kathryn Stalls
Rachel Deren	Samantah Stanley
Rachel Dinwiddie	Jesse Timmer
Andy Fellows	Sam Trevathan
Mary Grace	Heather Waters
Alex Grimm	Jonathan Watkins
Meagan Hall	Chris Watson
Lori Hamilton	Brett White
Jacob Hein	Bethany Wilhelm
Matt Hightower	Ryan Wilkerson

John Kelly Mark Woodring
Zach Kingins Tim Zeiss
Autumn Lowe

Friday, April 20, 2007

Oral Session

Accounting Session

Room 403, Business Building
Time TBA

Nidhi Agrawal – Accounting
Conceptual Framework

Chase Redden – Accounting
Income Taxation of Estates and Trusts

Nicole Suhrenbrock – Accounting
Fair Value Measurement

Exhibit

Clara M. Eagle Art Gallery
Doyle Fine Arts Building
Reception: 6:00 p.m.
Awards: 7:00 p.m.

OMAS Annual Student Art Exhibit Awards Ceremony

Faculty Advisor: Ms. Jeanne Beaver

Juror(s):
Ms. Catherine Tedford
Curator of the Brush Art Gallery
Canton, NY

Ms. Katherine Rhodes Field
Visual Resource Curator
St. Louis, MO

Other:

Auditorium, Lovett

Presidential Inauguration of Dr. Randy Dunn, the 11th President of Murray State University

Pogue Library
Immediately Following Ceremony

Presidential Inauguration Reception

Other Events

Tuesday, April 10, 2007

Performing Arts Hall
8:00 p.m.

Brass Chamber Music Recital

Director: Music Department

Brandi Adams	Grant Jones
Joseph Alexander	Matt Jones
Norman Blakely	Bryan Kelly
Sara Brewer	John Kelly
Anthony Brown	Zach Kingins
Chris Buis	Kent Klare
Matt Butterfield	Timothy Lee
Bekah Carmicheal	Shaun Linton
David Carmicheal	Autumn Lowe
Jacob Carroll	Megan Luse
Jarrad Chester	Eric Luther
Joshua Cole	Andrea Mastorovich
Richard Collins	Chris Missig
Breann Corley	Jonathan Nash
Kevin Dame	Greg Neff
James Damron	Michael Palmero
Anthony Darnall	Matthew Roark
Keith Dossett	TJ Robinson
Joel Eddings	Stetson Roof
Ben Edwards	Lincoln Rowe
Andrew Ellerbusch	Shaun Saulsberry
Lance Fulks	Ryan Weldon
Lori Hamilton	Cody Wells
Jacob Hein	Brett White
Kenton Henderson	Beth Wilhelm
Matthew Hightower	Justin Williams
Wesley Hughes	Mark Woodring
Brian Jennings	Liz Wontor

Thursday, April 12, 2007

Auditorium, Lovett
8:00 p.m.

Percussion Ensemble

Director: Mr. John Hill

D. J. Culp	Ben Rice
Andy Fellows	Stacey Rotterman
Brooke Kieffner	Kevin Suiter
Lori Maddox	Becca Thompson
Shane Melvin	Sam Trevathan
Robert Lamberg	Ryan Wilkerson

April 12-14, 2007

April 15, 2007 (2:30 p.m.)

Johnson Theatre
7:30 p.m.

“Dr. Faustus”

presented by the
MSU Department of Theatre and Dance
Director: Ms. Lissa Graham-Schneider

Cast:

Sara Jane Behl	David McCall
Heather Bradley	Cassie McMillion
Collin Buckingham	Micheal Odum
Lauren Cecil	Clair O’Neill
Alicia Christ	Derek Owen
Matt Collins	Kelsey Phelps
Patrick Duttweiler	Elijah Philips
Don Fleming	Erin Pruett
Katie Frank	Desiree Quast
Kari Frazier	Shannon Shelby
Brian Kinnamen	Daniel Trump
Jonathan Lodge	Georgena Ware

Jacob Lovell

Amanda Williamson

April 13 – 22, 2007

Friday, April 13, 2007

Art Gallery, Curris Center

Performing Arts Hall
8:00 p.m.

**University Chorale and
Chamber Singers**

Director: Dr. Bradley Almquist

Ashley Birdwell	Andrea Mastorovich
Joshua Boehman	Hayley McCuin
Stephanie Boh	Jamie McDowell
Brad Brauser	Brian McWherter
Angela Brown	Angela Mosely
Devan Caton	Amanda Moss
Jarrad Chester	Matthew Mothersbaugh
Richard Collins	Gregory Neff
Lasacha Conley	Holly Prichard
Rachel Deren	Nicholas Pullen
Christopher Douglas	Mary Reding
Amanda Enochs	Tomas Robinson
Felicia Gammon	Kimberly Rose
Rachael Golightly	Jordan Sangmeister
Liahna Guy	Jacob Scharping
Carl Harris	Stephanie Schultz
Emily Harris	Erin Sillman
Daniel Haulk	Kathryn Stalls
Kenton Henderson	Sarah Treberg
Matthew Hightower	Elaine Waddell
Jessica Hoskins	Kathryn Walker
Elizabeth Hostilo	Robert Watford
Melissa Korba	Ryan Weldon
Wendy	
Lauffenburger	

**Fallible Bodies: BFA Exhibition
of Drawings and Ceramics** by
Emily Detrick

April 16 – May 4, 2007

Clara M. Eagle Art Gallery
Doyle Fine Arts Building

**OMAS Annual Student Art
Exhibit**

Faculty Advisor: Ms. Jeanne Beaver

Juror(s):

Ms. Catherine Tedford
Curator of the Brush Art Gallery
Canton, NY

Ms. Katherine Rhodes Field
Visual Resource Curator
St. Louis, MO

Saturday, April 21, 2007

Performance

Auditorium, Lovett
8:00 p.m.

Jazz Bands Concert

Director: Mr. John Hill

Chris Buis	Tim Lee
Joshua Byrne	Shaun Linton
Cody Campbell	Andrew Lundy
Jacob Carroll	Mandy Main
Bobby Joe Clark	Kaylee Marks
Zach Coffey	Andrea Mastorovich

Josh Cole
 Breeann Corley
 Kevin Dame
 James Kyle Damron
 Jasmine Davis
 Paul Davis
 Keith Dossett
 Jaime Fairbanks
 Lance Fulks
 Paul Gradie
 Brad Hammack
 Kenton Henderson
 Matt Hightower
 Wes Hughes
 Grant Jones
 Matt Jones
 Carolyn Kramkowski

Amanda McGuire
 Jonathan Nash
 Bryce Norris
 Michael Palmero
 Matt Roark
 Joel Roberts
 T.J. Robinson
 Shaun Saulsberry
 Joe Tarry
 Bethney Terry
 Rebecca Thompson
 Rob Watford
 Chris Watson
 Ryan Weldon
 Cody Wells
 Mark Woodring
 Ahlam Yusuf

Lara Homsey
 Sarah Horn
 Grant Jones
 Matt Jones
 Blair Joseph
 Robert Lamburg
 Sarah Lee
 Cassie Lewis

Rebecca Thompson
 Erika Tracy
 Sam Trevathan
 Brant Veal
 Gracie Wallace
 Heather Waters
 Elizabeth Whitsett
 Emily Wuchner

Monday, April 23, 2007

Auditorium, Lovett
 8:00 p.m.

Orchestra Concert

Director: Mr. Dennis Johnson

Ryan Aldrich	Autumn Lowe
Joseph Alexander	Eric Luther
Jessica Arnold	Kaylee Marks
Anna Bartsokas	Brandon McKnight
Anna Brown	Shane Melvin
Chad Bugbee	Andrew Miller
Matthew Butterfield	Matthew Morris
Susan Caraway	Sue-Jean Park
Daye Choi	David Poole
Kevin Dame	Megan Richter
Rachel Dinwiddie	T.J. Robinson
Kala Dunn	Stetson Roof
Amber Fay	Kim Root
Nikki Fuller	Nicholas Schulz
Mary Grace	Nancy Steffa
Alex Grimm	Robin Thweatt

Tuesday, April 24, 2007

Performing Arts Hall
 8:00 p.m.

Brass Chamber Music Recital

Director:

Thursday, April 26, 2007

Auditorium, Lovett
 8:00 p.m.

Symphonic Band Concert

Director: Mr. John Fannin

Brandi Adams	Brian Jennings
Anna Barsokes	Brianna Jennings
Kenton Bennett	Amber Langston
Lindsey Bennett	Shaun Linton
Jenny Blue	Andrea Mastorovich
Stewart Bozarth	Daniel Mayo
Mandy Brandsasse	Morgan McCall
Sara Brewer	Brittney Meredith
Alex Bruner	Chris Missig
Renee Campoy	Matt Mothersbaugh
Bobby Joe Clark	Payton Pennington
Richard Collins	Kati Ponder
Breann Corely	Ashley Rawlings
Kevin Dame	Ryan Redmon
James K Damron	Giiny Richerdson
Adam Decker	TJ Robinson
Amanda Enochs	Blake Schroerlucke

Ashley Evans
Ross Farmer
Lance Fulks
Daniel Haulk
William Hiter
Wes Hughes

Foster Smith
Heidi Taylor
Bethney Terry
Justin Williams
Nick Wright

Sharon Gill
Katie Graves
Julia Griffith

Chris Watson
Cody Wells
Brett White

Notes:

The *Scholars Week* program was organized and compiled by:

Mr. Jody Cofer, Program Specialist
Undergraduate Research and Scholarly Activity Office

Mr. Zack McCoy, Student Assistant
Undergraduate Research and Scholarly Activity Office

Ms. Stephanie Morris, Student Assistant
Undergraduate Research and Scholarly Activity Office

Special Recognition

2006-2007 Undergraduate Research And Scholarly Activity Grants

Recipient	Faculty Mentor(s)
Melissa Addressi	Art Pallone
Erin Black	Ted Thiede
William Criner	Pat Williams
Jason Cummings	Ted Thiede
Tyler Downing	Suguru Nakamura
Anna Edwards	Kathleen Farrell
Carrie Elliott	David Ferguson, Iin Handayani, Pat Williams
Zac Elmore	Suguru Nakamura
Sara Evans	Art Pallone
Annette Fowler	Bommanna Loganathan
Jonathan Lewzader	Edie Banner
Jessica Lindley	Dale Barnett
Shannon McGregor	Lara Homsey
Monica Morrison	Suguru Nakamura
Preston Morrow	David Owen
Michael O'Brien	Howard Whiteman
Tyler Parrott	Mark Wattier
Nathaniel Cole Phelps	Suguru Nakamura
Tara Pool	Dan Wann
Teresa Ray	Kate King
Cynthia Shaw	Pablo Molina
Whitney Shirley	David Ferguson, Iin Handayani, Pat Williams
Heather Stroupe	Paula Waddill
Kaleb Tapp	David Ferguson, Iin Handayani, Pat Williams
Andrew West	Claire Fuller

2006-2007 Undergraduate Research Scholar Fellowships

Recipient	Faculty Mentor
Zachary Brian	Kate He
Todd Broker	David Eaton
Erin Cathcart	Pat Williams
Colin Corbett	Daniel Johnson
Ebone` Hatcher	Paula Waddill
Nathanial Luffman	Bill Schell
Holly Mowerly	Bommanna Loganathan
Shane Newborn	Kate He
Komal Patel	Kate He

2006 MSU Alumni Association Distinguished Research Award

Dr. Ramesh Gupta, School of Agriculture



3rd Edition

How Does Attention Deficit Disorder Affect Co-Worker Communication and Organizational Assimilation?

J. Chris Bensing
Faculty Mentor: Lou Tillson

From Childhood to Maturity in Henry James "What Maisie Knew"

Kristyn Brown
Faculty Mentor: Peter Murphy

Horticulture, a Key Source of Introducing Exotic Species to Native Communities and Ecosystems

Jacqueline Hawes, Laura Gossett, Jami Kara Hitch, Erica Ludtke, Sara Struve,
Laura Gossett, and Nicole Zelesnikar
Faculty Mentor: Kate He

Maintaining Participation with Communication for Individuals with Dementia of the Alzheimer's Type

Jill Ligon
Faculty Mentor: Kelly Kleinhans

Assessing the Influence of Rock Music on Emotions

Jonathan Hill
Faculty Mentor: Alysia Ritter

A Critique of the Global State of Religious Freedom

Katie Oller
Faculty Mentor: Farouk Umar

The Effects of Diet and Social Stress on Humoral and Cell-mediated Immunity in Peromyscus leucopus

Courtney Thomason and Tiffany Hedrick
Faculty Mentor: Terry Derting

Cassie Abbott, Katie Adams, Brittnie Ainslie, Yvonne Anderson, Leah Barker, Amanda Barnt, Amanda Cerny, Betty Cleaver, Kathleen Dixon, Andrea Elliott, Nathan Futrell, Megan George, Dameca Jerman, Toshiharu Kikuchi, Jacinda Lewis, Anita Long, Kelly Lynch, Amie Miller, Leigh Nason, Cowann Owens, Laura Schroeder, Laura Shreve, Wayne Simpson, Patricia Siza, and Chelsie Zeigler

Virtual Agency Collaboration with a Local State Agency

Mentor / Sponsor: Peggy Munke

Students in SWK 313 developed a virtual agency to serve their virtual community to do methamphetamine abuse education and to provide services to virtual clients who are struggling with issues involving methamphetamine abuse. The class as the virtual agency collaborated with the local DCBS regional office to develop a mailing list [both electronic and snail mail] to notify all religious organizations and churches in an eight county region about a community training opportunity related to community methamphetamine education. As payback, the local DCBS agency is sending the whole class to the train the trainer training offered to the organizations on the mailing list. This means that the DCBS agency accomplished a time consuming project resulting in a data base of close to 1000 names with the expenditure of no agency resources and the students gain experience and a training opportunity that upon successful completion will allow them a useful item for their resume, that is, certified trainer in this area.

Charissa Acree – Journalism and Spanish

The Media and Cuba: The Influence of Communism on the Media of Cuba

Mentor / Sponsor: Leon Bodevin

Historically, two major catalysts for change have been revolution and the mass media. Both have served as a voice for the people in times of injustice and have brought about both positive and negative change. The Cuban Revolution succeeded in overthrowing the Bautista dictatorship in 1959 and established the island to the south of Florida as one of the world s communist countries. Fidel Castro Ruz and his leaders have widely applied the Marxist ideals of Lenin in Stalin to all aspects of Cuban society, including the media. The media in Cuba are greatly influenced by these ideals through education, professional environment, and everyday life experiences. This presentation will seek to reveal the true position of the media in Cuba.

Charissa Acree – Journalism and Spanish

Los Medios: The Hispanic Populations Influence on Print Media

Mentor / Sponsor: Ann Landini

In the past decade, more people of Hispanic origin have moved to the United States than at any other time in our history. In 1997, researchers estimated the Hispanic population in the United States would reach 28.2 million people. By 2005, it reached 35 million and was still growing. This influx of immigrants has caused the nation to adapt in various ways. Meanwhile, print media in the United States in general has experienced just the opposite declining readership among print media has caused many companies and editors to step back and evaluate whether or not they may continue to exist. But this is not the case among the Hispanic population, where print media geared toward their lives and culture is booming. In 2004, Hispanic newspapers were an \$854 million dollar industry with more than 700 publishers. These publications exist in some of our nation's largest cities, and reach an audience of more than 17.5 million people. Print media coverage is not limited to newspapers alone, as many of the nation's major magazines are publishing Hispanic-versions of their parent publications and other magazine publications geared to the Hispanic public are appearing on a yearly basis. This increase is attracting print media companies and advertisers alike, who are eager to cater to this increasing readership. This project will carefully analyze several different aspects of the effect the growing Hispanic population is having on the print media industry both past, present and future.

Melissa Addressi – Engineering Physics and Sara Evans – Applied Physics

Camcorder Astronomy: Measurement of Seeing Quality

Mentor / Sponsor: Art Pallone

Before the advent of webcam modifications and inexpensive CCD cameras for astronomical imaging, amateur astronomers converted camcorders to take guided, long-exposure images. Advances in image processing software now permit the assembly of unguided, short-term exposures into images equivalent to those from one long-exposure. Atmospheric conditions affect the ultimate quality of all images taken from the surface of the Earth. Before the exploration of the limits of image construction from the short exposures taken with a VHS-C camcorder, the atmospheric seeing was quantified by a time-variation analysis of bright stars captured by the camcorder under different conditions from the same urban environment as the video used for image construction. Such variations cause the familiar twinkle of stars, variations in star position and brightness that reduce spatial resolution and limit the accuracy and precision in magnitude measurements of objects that can be recorded in an image. The rotation of the Earth produces a steady movement of the stars across the field of view of the camera at a rate of approximately 1 degree every 4 minutes. The star motion due to the mount is produced by two sources: vibrations transmitted from the surroundings to the camcorder and sudden disturbances caused by wind gusts, bumps, and re-pointing of the camcorder. The remaining motion of stars in the field of view is used to quantify seeing conditions as is the changes in brightness of these stars.

Nidhi Agrawal – Accounting

Conceptual Framework

Mentor / Sponsor: Tim Miller

The Conceptual Framework is like a constitution: A coherent system of interrelated objectives and fundamentals that lead to consistent standards. It was developed by The Financial Accounting Standards Board (FASB) in 1976 as the basis for setting accounting standards and resolving financial reporting controversies. The Conceptual Framework explains why the accounting profession handles a project in a particular way. The FASB has issued six Statements of Financial Accounting Concepts and has three levels: Basic Objectives, Fundamental Concepts, and Recognition and Measurement Concepts. The Basic Objective of financial reporting provides useful information for investment and credit decisions. The Fundamental Concepts of the Conceptual Framework are the Qualitative Characteristics of Accounting Information like relevance and reliability. The third level explains how companies should recognize, measure and report financial elements and events through some assumptions, principles and constraints. The framework has not kept up with the changing times and hence, needs to be updated and refined. Recently, the FASB and The International Accounting Standards Board (IASB) took a significant step forward in their joint venture to update and converge their existing frameworks (they have similar issues on their conceptual framework and working together will provide greater consistency in global standard setting). This milestone took the form of Preliminary Views document which are reviewed in this paper and should eventually lead to consistent global accounting.

Laura Allard – Economics and Nicole Fontanette – Pre-Veterinarian

Man's Best Friend: At What Price

Mentor / Sponsor: Howard Whiteman

This presentation will focus on the relationship between economics and veterinary medicine, while exploring the scientific advances that have led society to increase the monetary investment they expend on their pets through medicine and treatment. We consider factors such as the increase of household incomes over the last twenty years, the increase in cost of various veterinary procedures, and the increase in variety of procedures over the last twenty years. With this information, we will consider the change in demand for pet services, as well as the change in supply based on the differences in household income. We will also take a closer look at how veterinary medicine has advanced over the years primarily in relation to demand for improved treatments of diseases and conditions, and possibly in relation to advancements in human medicine and medicinal techniques. We will also consider advancements made in veterinary technology, such as improved machinery. We expect to show that, an increase in household incomes has led to a willingness to put forth an extra amount of time, money, and effort to prolong the lives of their nonhuman family members, and that veterinary medicine and technology have advanced exponentially over the years.

Sherri Anderson, Megan Bivens, Clay Boyd, Whitney Bush, Dennis Carbrough, Amy Carter, Kara Clark, Rose Clark, Courtney Cook, Natalia Cunningham, Karen Delaney, Michael Dennis, Andy Dukes, Josh Dunn, Kelli Eckdahl, Rachel English, Amanda Enochs, Whitney Fowler, John Gorrell, Erin Gray, Ben Henke, Myshayla Herron, Kim Hill, McKinzey Hodge, Allie Hunt, Sabrina Johnson, Jamie Jones, Jacqueline Jordan, Mandy Laszenski, Nathan Marshall, Janel McGill, Nathan Moore, Bethany Powell, Amber Roach, Brittany Shemwell, Shaina Slowaik, Jenny Smith, Michael Stranger, Brian Stutler, Joy Toler, Jessica Weatherford, and Greg Widelski

American Humanics/ YNL 350: Program Development Course

Mentor / Sponsor: Roger Weis

The American Humanics program is an innovative course of study that equips college and university students to become skilled professionals and leaders in America's nonprofit organizations. The YNL 350 course focuses on program development and the incorporation of service learning into the classroom. Service-learning is a method of teaching, learning and reflecting that combines academic classroom curriculum with meaningful service, frequently youth service, throughout the community. More specifically, it integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, encourage lifelong civic engagement, and strengthen communities. The past YNL 350 course did a variety of projects in order to strengthen their community. The projects ranged from developing ways to decrease racism, to establishing clothing drives, and even proper pet care. Each project addressed a need that existed in the community of Murray and Calloway County.

Brent Arnold – Geosciences

An Analysis of Impact of a Residential Suburb on a Watershed Using Remotely Sensed Data

Mentor / Sponsor: Haluk Cetin

Urban sprawl has been found to change the flow of water within a watershed due to concrete channels, gutters, and other man-made drainage structures to forces the water to flow a certain direction. This search looked at the impact a residential suburb had on a watershed using remotely sensed data. The study area was the Canterbury Hills development east of Paducah, KY, located at: 37 0' 21" N, 88 30' 46" W. Remotely sensed data will have a comparison to actual ground data.

Chad Ashby – Business Administration

Ping-Pong Tournament

Mentor / Sponsor: Kelly Rogers

To complete the service learning requirements for REC 520 this spring, a ping-pong tournament was conducted at the Senior Citizens Center. The purpose behind this program was to physically and mentally stimulate the mind and body. Ping-pong is an activity that is held every Tuesday, but hopefully with this tournament will help increase the numbers of participation in the future. All seniors had the opportunity to participate in the ping-pong tournament, although not all did.

Sarah Baker – Economics

The Future of the U.S. Labor Market: What Will Be the Effect of the Exit of Baby Boomers and Entrance of Generation Y

Mentor / Sponsor: David Eaton

As the baby boomer generation begins to retire and leave the work force, generation y is beginning to enter the work force. I define baby boomers as those people born between 1946 and 1964, and generation y as those born between 1976 and 1994. While many questions can be explored, my study will focus on how the differences between these two generations will effect the labor market? Although many in the baby boomer generation have inflated wages due to a highly experienced work force, generation y is statistically the best educated generation of Americans. My main focus will be on the question, what are the predicted impacts of the change in education level?

Shannon Bean – Accounting

Accounting for Uncertainty in Income Taxes

Mentor / Sponsor: Tim Miller

In June 2006, FASB Financial Interpretation No. 48 (FIN 48) was passed requiring compliance from all entities that prepare GAAP financial statements. Under the previous standard, Statement 109, there was no recognition threshold or measurement feature for recognition and measurement of tax positions determined by the statement. FIN 48 is a recognition model that uses a two-step approach and tax positions to describe the assortment of uncertainties that fall under the Interpretation. FIN 48 raises new issues for accountants and tax preparers. While accounting for a tax position is essentially the same as prescribed in Statement 109, FIN 48 also establishes recognition and measurement of their financial statement effects. The enterprise should recognize the effects of a tax position if it is “more likely than not” that the tax position will be upheld. If a tax position meets the “more likely than not” requirement, it shall originally be measured as the largest amount of the tax benefit that is greater than 50 percent likely of being realized when a final conclusion is reached with a taxing authority. The difference between the benefit of the tax position in the tax return and the amount recorded on the financial statement should be classified as either a reduction of deferred tax assets resulting from a temporary difference or a current or non-current liability.

Erin Black – Mathematics*Styrofoam Recycling Initiative*

Mentor(s) / Sponsor(s): Mark Malinauskas and Don Robertson

Murray State University's recycling program has matured since its initiation in the seventies, but still has room for growth. One such opportunity for improvement occurs within the types of materials recycled. Styrofoam, for example, is prevalent on campus, and technology exists for recycling this product. In 2001, America recycled 55.3 million pounds of Styrofoam. Murray State University has yet to take advantage of this resource. Recycling our Styrofoam intake would have positive impacts. To support this, gathered information and research will be presented as a compilation of ideas, facts and figures in a proposal. This proposal will detail every aspect of implementing and continuing a workable Styrofoam recycling system. It is hoped that as a result of this study Murray State University will develop a Styrofoam recycling program.

Meg Black – English Education*The Importance of Prenatal Care*

Mentor / Sponsor: Howard Whiteman

Upon learning that they are pregnant, many expectant mothers alter their lifestyles in an effort to give their child every advantage possible. However, sometimes something small can be overlooked that may potentially affect the unborn child. As college students, many of us are at an age where children may be in our future within the next several years. Now is the ideal time to learn the information that could have a profound effect on our future. It is important that expectant mothers (and future expectant mothers) and their partners fully understand the possible risks their child may be exposed to during the prenatal period. There are the obvious dangers if the mother has taken drugs, alcohol, or smokes. While I will look into the effects these agents have on the prenatal child, I will be focusing more on the less obvious. Women often go to such lengths as taking vitamins or antibiotics and having ultra-sounds in an effort to try and have a healthy baby. However, these methods may, in fact be harmful to an unborn child. That is why it is so important for people to understand what needs to be done to ensure that a child is born without any preventable birth defects.

Erin Bogle – Middle School Education

Middle School Education Portfolio

Mentor / Sponsor: Mark Malinauskas

A portfolio is a purposeful collection of documents that demonstrate and showcase a student's learning experiences and growth in a particular field. This thesis project contains such a portfolio in my chosen field of education. The purpose of this document is not only to verify that I have met each of the nine New Teacher Standards for Preparation and Certification, but also to reveal the growth I have made as an educator. This project is both professionally and personally based. It contains a range of artifacts, from research-based studies to internally reflective thoughts; it is the product of Murray State University's teacher education program, but more importantly, my own journey to find what makes a good teacher great.

Stephen Boh – Biology and Mitchell Thomas – Economics and Finance

The Future of Weapons Technology

Mentor / Sponsor: Howard Whiteman

The technology used in weapon systems of the United States has radically evolved since our conception. From single shot muskets, to automatic weapons customizable for personal preference, we have evolved to become extremely efficient in the art of warfare. Not only has our infantry arsenal improved dramatically, but so have our water vessels, armored vehicles, and aircrafts. Scientists have helped the U.S. innovate in order for us to retain our military supremacy over the world. They have created faster engines with more range so our planes can launch from a safe zone, make their way to the target, and return to base to keep the majority of military personnel involved with a mission out of harms way. They also have designed smart bombs which can identify their targets and destroy them without any human intervention. In addition to helping us protect our nation, science has also enabled our enemies to be more effective at killing us as well. Whether it be with dirty bombs made by scientists in foreign countries or with weapons made through United States defense contracts, our soldiers are facing better technology than ever before and being exposed to more dangerous toxins. This battle of science is why the United States must continue to innovate and improve our weapons to stay ahead of our opposition.

Jay Braffett, Bradley Jones, and Steve Ramage – Occupational Safety and Health

Pogue Library Floor Tests

Mentor / Sponsor: David Fender

The floorings in Pogue library at Murray State University were tested to determine dry and wet coefficients of friction. While the tests focused primarily on the marble floorings that are present at the two main entrances, several other flooring types located in various parts of the library were tested also. Tests performed were static coefficient of friction dry and wet, and dynamic coefficient of friction wet. Static coefficient of friction is the force required to make one object, which is in contact with another object, begin to move. Whereas, dynamic coefficient of friction is the force required to keep the object that began to move by static friction, continue moving. The wet coefficient of friction was consistently higher than the dry coefficient of friction, especially in regards to the marble floorings located at both main entrances. Therefore, according to the BOT 3000 floor tester, the floorings are safer wet than dry. Our recommendation is to use a National Floor Safety Institute(NFSI) Certified floor cleaner and finish instead of what is currently being used. By using NFSI certified products, the floorings can be made safe during both dry and wet conditions.

Todd Broker – Economics

Risky Business: A Look at Individual Decisions of Risk and Uncertainty

Mentor / Sponsor: David Eaton

This paper looks at the current literature for assessing individual risk decisions and makes certain assertions about its usefulness and possible recommendations for its future. An original survey was conducted with Murray State University students that captured certain risk attitude measures. This data was analyzed for consistency between risk groups of financial risk, on-the-job risk, and risk to safety and health. Connections are made between the empirical survey data and the current literature on the subject. Finally, individual components of the data, including the demographic background of individuals, were sorted and evaluated. In particular, levels of individual religiosity were examined for risk patterns. Possible models are explained and suggested to further this research into other areas such as financial asset risk assessment.

**Hope Browning – Special Education, Stephanie Henderson – Elementary Education,
and Rebecca Schweiker – Education**

Road Kill Survey

Mentor / Sponsor: Howard Whiteman

The Land Between the Lakes National Recreation Area has decided to expand highway 68/80 from two to four lanes. Once a week for the past several weeks, a road kill survey has been conducted to count the number of different species found along 68/80. The results of this investigation are used to predict how the highway extension affects this number. This project also examines how the surrounding habitat will be able to sustain the new construction. By creating additional lanes, highway 68/80 traffic will increase. Natural habitats will be invaded. For these reasons, the number of road kill along highway 68/80 will increase with the new lanes. To maintain the stability of the environments at Land Between the Lakes, it is important for the park owners to consider all consequences associated with this decision.

Jessica Bruner – Psychology

Intercollegiate Athletics and Disordered Eating

Mentor / Sponsor: Pam Rice

The world is thinner. The ideal person is getting skinnier and trimmer every day. This has caused increased pressure to be that ideal body size and weight. People believe that they are being judged on the way that they look. In college women in the United States, this trend seems to be very common. Intercollegiate athletics appears to be suffering the greatest when it comes to pressure to be a certain body type. There is a rise in the amount of institutions in the National Collegiate Athletics Association dealing with eating disorders. In the most recent study done by the NCAA, 90% of all institutions had at least one diagnosable case of an eating disorder. This number has increased by 20% since the previous study. With the increasing number of athletes, female and male, with eating disorders, the purpose of this study is to look at the prevalence within the colleges that are in the Ohio River region and to determine if there can more done to prevent these disorders through education and policy changes.

Philadelphia Bruss – German

Jews in New Films about World War II

Mentor / Sponsor: Reika Ebert

This presentation will explore the Jewish experience under Nazi rule during World War II in three films: *Europa Europa*, *Aimee und Jaguar*, and *The Pianist*. In the last fifteen years, the film industry in Germany has begun to look at the struggles of Jewish people to survive the Holocaust. This presentation looks at the themes of love, fear, hate, and the willpower of the Jewish people, who created strategies to escape persecution and remain undetected. As a result of these strategies, the relationships that formed between Aryans and Jews demonstrate how the pressure of Nazi Germany was devastating. Although these films have received some animosity from Germans and some critics believed that *Europa Europa* would be the last of its kind, a new attitude of exposing the authentic Jewish experience of World War II has emerged.

Julia Buckman – Management/Human Resources

Alzheimer's Disease and Its Impact

Mentor / Sponsor: Howard Whiteman

For my *Scholars Week* Project, I would like to explore the world of individuals suffering from Alzheimer's disease. I would like to give a brief background on the biological conditions that cause the changes in an individual and the effects of such changes. More importantly, I'd like to focus on the research for a cure, the medications currently used to alleviate symptoms, and the future of this heartbreaking condition and its treatment. A primary focus of my presentation will be the social and cultural impact of such a disease on our aging population, especially considering that Baby Boomers are reaching such a stage. More specifically, my presentation will include the following: facts about Alzheimer's, the difference between Alzheimer's and dementia, risk factors, and the 7 stages of the disease. Last summer, I worked as a Health Administration intern in the only long-term care facility in Kentucky that has an Alzheimer's/dementia unit, and I hope to incorporate my experiences there as well.

Kelley Carter – Communication Disorders

Shoot the Moon with High Nine: A Service Learning Program

Mentor / Sponsor: Kelly Rogers

The purpose of conducting a high-nine card tournament was to promote a healthy social atmosphere while stimulating cognitive ability for senior citizens. This program was part of a 15-hour service learning scholar's requirement for REC 520 Leisure and Aging. The ladies and gentlemen who participated in the card tournament ranged in age from 65 to 89. Because there were around 10 teams with two members in each, the tournament lasted for a week and concluded with a high-nine championship game.

Erin Cathcart – Horticulture

Short Term Effects of Worm Casting By-Products on Whitefly Reduction and Germination Rates in Greenhouse Production

Mentor(s) / Sponsor(s): Pat Williams and Kris-Ann Kaiser

The initial goal for Study 1 was to grow poinsettias (*Euphorbia pulcherrima*) and reduce whitefly (*Trialeurodes vaporariorum*) populations strictly using organic worm casting by-products methods. There were four experimental treatments each with four repetitions using a randomized block design. Treatment 1: control containing no worm castings or compost tea sprays; Treatment 2: 10% worm castings incorporated in the Pro Mix BX only; Treatment 3: 10% worm castings incorporated and sprayed with the worm compost tea; and Treatment 4: worm compost tea sprays only. Compost tea was applied every two weeks. No significant differences were found among treatments, but were found between repetitions and benches. Whitefly counts ranged from 130-1374/plant and none were considered marketable. In Study 2, one-year old worm castings were added to Pro Mix BX substrate at 20% by volume and incubated at a substrate temperature of 22.2o C (72o F) to observe germination rates of California poppy (*Eschscholzia californica*). Three treatments were studied to determine the shortest germination periods. Treatment 1: control received no incubation period; Treatment 2: incubated for seven days; and Treatment 3: incubated for 14 days. Normal germination rates and range for California poppy are between 60-70% at 21 days. Treatments 2 and 3 were significantly different for germination percentage on days 10, 12 and 14 at $p < 0.001$ over Treatment 1. Treatments 2 and 3 had germination percentages higher than normal from 76-82% on days 10, 12 and 14. Incubated worm casting substrate mixtures increased germination percentages and reduced days to germination.

Elizabeth Cawein – Journalism

Reading Between the (Bar) Lines: The Social and Cultural Impact of Music Journalism

Mentor(s) / Sponsor(s): Joe Hedges and Mark Malinauskas

Was it Elvis Presley's gyrating hips on the Ed Sullivan Show or the Beatlemania headlines plastered on newsstands throughout the United States in 1964? Or was the death of Buddy Holly, Richie Valens and the Big Bopper - the day the music died - the day music journalism was born? Wherever its origins can be traced, one thing is certain: the journalism surrounding music has been almost as important to the way it has shaped our nation as the music itself. A departure from traditional reporting, music and pop culture news wasn't always considered news by fundamentalists on both sides of the newsprint editors and readers. But today, it often consumes the American people and their media, stealing dozens of pages in a daily newspaper and hours of time on CNN. So is it mere gossip, or the chance to live vicariously, that is the opiate of these masses? Or is there something about these stories that is ever more necessary and relevant to our society? Music and pop culture writers might hope it is the latter, political reporters might argue otherwise, but the social and cultural evolution of a people led by the ink of a songwriter's pen is perhaps irrefutable.

Craig Collins – Mathematics

Optimal Control of Mixed Immunotherapy and Chemotherapy of Tumors

Mentor / Sponsor: Renee Fister

Mathematical models are frequently employed to describe the interaction between various medications, the immune system, and tumors. The application of optimal control to such models provides valuable information in the search for improved treatment strategies. Models of this type often contain different types of constraints - many of which necessitate modifying standard optimal control techniques. The focus of this talk will be methods used to expand optimal control theory to incorporate various constraints.

Dianna Conner – Economics

Subprime Lending and Housing Market Values: Is there a relationship?

Mentor / Sponsor: David Eaton

Over the past five years, housing values have increased nationally by an average of 68.3%. While low-interest rates have contributed to the recent surge in property values, subprime lending has also played a pivotal role. Subprime lending is lending to consumers with "bad" or nonexistent credit, as well as lending to consumers with "good" credit by offering a wide variety of products that the prime market does not have. For example, "good-credit" borrowers are offered financing on 100% of the home's value using an interest-only loan, and also financing on second mortgages that allow consumers to extract up to 115% of the home's value. Products such as these have not only brought about many changes to the mortgage industry, but also have made housing more affordable and attractive. The Depository Institutions Deregulatory and Monetary Control Act in 1980 helped launch the idea of subprime lending by lifting constraints on rate caps and allowing mortgage companies to tailor their products to a diverse consumer base in terms of risk. The subprime market hit an all time high in 2005, capturing 23% of the market share by originating \$650 billion in nonconforming loans. By increasing the amount of potential home-buyers in the market, I anticipate that subprime lending will cause housing values to increase. Specifically, this study will use differences in state usury laws to isolate the impact of the subprime market on the housing market values.

Colin Corbett – Chemistry

Biochemical Assays for Methyltransferase Enzymes on a Microfluidic Platform

Mentor / Sponsor: Daniel Johnson

Current research involves the development of a method to analyze inhibition of a methyltransferase enzyme on a microfluidic platform. This has involved the design of a procedure to fabricate glass chips on which to perform separations by capillary electrophoresis to analyze inhibitors of the methyltransferase. Patterns for the separation channels are made using a photoresist, and the channels are etched into the glass using hydrofluoric acid. While the project is still in progress, inhibitors of the methyltransferase will be analyzed by separating the methylated product and the reactant peptides on the glass chip with an applied high voltage. For detection, an instrument has been constructed in which a mercury arc lamp is used to excite a fluorescent substituent group attached to the peptides, and a photomultiplier tube is used as a detector. In this way, the product and reactant peptides can be detected, and the inhibition can be measured by the magnitude of the fluorescence detected by the photomultiplier tube. It is expected that this method may be used in the pharmaceutical industry as a preliminary test of a compound's potential as a marketable drug.

Rebecca Cripps – Biology

Comparison of Nitrogen Isotopic Signatures of Bluegill from Kentucky Lake and Ledbetter Creek

Mentor / Sponsor: George Kipphut

It may be possible to determine what habitat an animal is living in by examining the food it consumes through its isotopic ratios. This study is examining the nitrogen and carbon contents in the muscle tissue of Blue Gill fish in Kentucky Lake Reservoir and Ledbetter Creek in western Kentucky. Previous research has shown that the ratios of nitrogen and carbon isotopes in fish and other animals vary depending on their food source. The ratios I examined were $^{15}\text{N}/^{14}\text{N}$ and $^{13}\text{C}/^{12}\text{C}$. Tissue samples were taken from Blue Gill from both the Reservoir and Stream environments and analyzed with a Mass Spectrometer which determined the isotopic ratios. Resulting data displayed that the Blue Gill caught in Ledbetter Creek were spending a large amount of their time feeding within the stream enough so as to alter their isotopic signature to resemble the stream habitat as the basis of its food web as opposed to that of the reservoir. These results have led to a better understanding of how the Blue Gill utilizes both the Stream and Reservoir environments.

Janelle DeCoursey and Melissa Seay – Occupational Safety and Health

Seatbelt and Crosswalk Surveys

Mentor / Sponsor: David Fender and Tracey Wortham

This report contains a summary of baseline data collected on Tuesday, October 24 and Wednesday, October 25, 2006 at nine various locations on the campus of Murray State University in Murray, Kentucky. This survey was also done in 2004 and in 2005. Locations include the Industry and Technology parking lot, Dorm Circle parking lot, White College parking lot, Curris Center parking lot, Sparks Hall parking lot, on the corner of 15th Street and Olive Street, on the corner of 16th Street and Calloway Avenue, on 16th Street in front of the Public Safety parking lot, and in the 16th Street and Chestnut Street parking lot. Twenty-two members of the Murray State University American Society of Safety Engineers Student Section collected this data between 7:45 a.m. to 12:30 p.m. on October 24, and 9:00 a.m. to 1:40 p.m. on October 25. All observations were taken from vehicles that possessed a Murray State University Vehicle Parking Tag. In 2006, the observations totaled 1,563 including 1,411 drivers and 152 front seat passengers. At the request of public safety the student section did a survey of crosswalk use. Members of the student section, with the assistance of our advisor, developed a survey form, selected locations, performed the observations and analyzed the results. A total of 2,451 observations were made at 9 locations on and on the perimeter of campus during the months of February and November 2006.

Jonathan DeMarie – Psychology

Joint Mobilization Just Loosen Up

Mentor / Sponsor: Pam Rice

When a person undergoes joint surgery, or suffers an injury to a joint, the body goes through three phases of the healing process. When it comes to rehabbing a patient, it is very important for the physical therapist, and the athletic trainer to understand how to incorporate a well-constructed rehabilitation program within the three phases. The use of the right type of equipment and technique will return the patient back to their normal everyday life. As the rehabilitation process progresses, the patient most likely will experience pain and tightness within the joint. There is a technique used by physical therapist, and athletic trainers to reduce pain and tightness. This technique is called joint mobilization. Joint mobilization is used to improve joint mobility or to decrease joint pain by restoring accessory movement to the joint, thus allowing for full non-restricted pain-free range of motion. Joint mobilization can be used on every major joint in the body. In my presentation, I will discuss the effectiveness of joint mobilization in rehabilitation. I will also talk about how to perform joint mobilization on all the major joints in the body.

Emily Detrick – Art, Ceramics

Fallible Bodies: BFA Exhibition of Drawings and Ceramics

Mentor(s) / Sponsor(s): John Utgaard and Mark Malinauskas

My BFA Exhibition in the Curris Center Gallery, April 13 - 22, will consist of ceramic sculptures and drawings on paper and canvas. The artwork is representative of the ideas that have evolved over the course of my education and recent life experiences, and is reflective of the techniques and processes I have learned through studio classes at Murray State University. The driving concept behind my work is the complex relationship humans have with their bodies, primarily the alienation that occurs when disease, age, or other such forces cause inexplicable or "unfixable" changes. I am interested in the ways in which we deal with these events and the interaction between science and technology and our more primal animal instincts. Synthesizing animal, human, and mechanical imagery, my work questions what we are made of and how we care for and respond to it. This synthesis is more literal in my drawings, which narrate issues of illness, consumption, and alienation from the body. Through sculpture I explore different expressions of the unpredictable forces acting within us, some more literal and others abstracted, simplified, or rooted in an emotional response. I use clay to construct a three dimensional form in order to evoke empathy with the loosely figurative, vessel-like structures. This presentation will take the form of a gallery exhibition of the artwork, in addition to a written overview of the influences, research, techniques and processes that have guided the progression and development of my ideas into fine art.

Emily Detrick – Art, ceramics and Rebekah Clay – undeclared

The Science of Glass: History, Uses, and Technologies

Mentor / Sponsor: Howard Whiteman

We propose to investigate glass, focusing on its history, processes, uses, and correlated or resulting technologies. From accidental discovery through ancient ceramic glaze techniques to a multitude of modern technologies, glass has been and will be a part of everyday life across cultures. Glass is essentially an amorphous solid composed of silica, an alkali to lower its melting point, and lime to stabilize the solution. The components of glass are heated to an extremely high temperature and then cooled rapidly. This process does not allow the atoms to form into a crystal lattice, and is one of the main identifying properties of the material. Many different materials may be added to it in order to change its properties, such as color or thermal resistance. Natural glass occurs during volcanic eruptions (obsidian). The Phoenicians discovered glass while cooking on the beach when sand (silica) and other substances were heated from the fire. Glass blowing was developed by Syrians around 27 B.C. to 14 A.D. The Romans spread the trade initially; later other cultures made important advancements such as the Venetians during the 13th-16th century. The Industrial Revolution made mass production and advances in glass technology possible, such as sheet glass. Contemporary society uses glass in a variety of ways ranging from basic vessels to fiber optics. Polymerization has made new types of functionality possible, such as safety glass, Pyrex cooking vessels, insulation, and lenses. By bringing to light examples of the varied roles of glass in science and technology we will educate our audience on this unique and important material and how it has changed the way we live.

Brad Diggs – German

Bertolt Brecht and Gerhart Hauptmann: A Literary Comparison

Mentor / Sponsor: Meg Brown

Many people associate the late 19th and early 20th century Germany with its reunification, strong economy, and growing imperialism. This atmosphere of growth and political tension also produced some of the greatest literary works of the 20th century. The names of Bertolt Brecht and Gerhart Hauptmann are well known throughout the world for their social and literary influences. Both authors lived during roughly the same literary period, although each contributed to literature in very unique ways. This paper will examine the economic, social, and political views of Brecht and Hauptmann through a comparison of two famous works. Brecht's *Die Heilige Johanna der Schlachthofe*, and Hauptmann's *Die Weber* are good examples of their respective beliefs. One can see distinct differences, as well as some similarities between Brecht's somewhat Communist ideals and the naturalistic views of Hauptmann.

Phillip Dishon – Electronic Media Television

Being Brakhage: An Exploration of Independent Film Production

Mentor / Sponsor: Jeremy McKeel

Independent filmmaker Stan Brakhage has been filming and creating his own personal works since the early 1950s. Working entirely independent from the business realm of Hollywood, Brakhage created cinematic works that defied the norms associated with film eliminating such elements as story, character, plot, sound, and linear arrangement. It is my hope, both as a video production major and as an aspiring filmmaker, to explore this same approach to production by completing a collection of short video pieces that will allow me to creatively explore editing effects, color, the visual image, and sound production. By completing each of the shorts entirely as an individual, I hope to gain a better understanding of the creative process and every aspect of film production.

Phillip Dishon – Electronic Media Television

High Definition Television: The Expense of Broadcasting Development

Mentor / Sponsor: Howard Whiteman

High-definition television is quickly becoming the norm of television broadcasting in the United States with many cable and satellite providers as well as television studios creating programming specifically for HD TV. In this project, I intend to explore the lengthy history of HD TV from its original incarnation in Japan during the 1960s up until its present day form. I will also explore why the development of HD broadcasting has taken so long to become readily accepted and discuss the technological advances that shaped HD television. However, the presentations primary focus will be on where HD TV is going as far as scientific breakthroughs and what other possible implications HD broadcasting may have on the world. This will include not only scientific breakthroughs, but also governmental factors pushing for HD television becoming the dominant broadcast format. I will also compare and contrast the benefits and negatives of HD TV compared to regular analog television. By researching this project, I hope to gain a better understanding of the technology that will shape my field of study and television for the future.

Tyler Downing, Zac Elmore, and Cole Phelps – Biology

Enzymatic Activities of Renal H+K+-ATPase in Hyperglycemic Mice

Mentor / Sponsor: Suguru Nakamura

It has been demonstrated that H-K-ATPase (HKA), a potassium dependent proton secretion transporter, plays an important role in acid-base homeostasis. Studies have shown that gastric isoform (gHKA) is dominant under normal conditions and colonic isoform (cHKA) is increased under low-k conditions. However, the enzymatic activity of HKA in the OMCD is incompletely understood. In order to understand the role that glucose plays in the activity of HKA, hyperglycemia was induced in animal models through an intraperitoneal injection of streptozotocin. Both wild type and transgenic mice were used, where the transgenic mice (HKA α_2) have the cHKA isoform knocked out. Upon testing the enzymatic activity, wild type mice were found to produce a lower amount of ADP, which is produced through hydrolysis from ATP when activating H+K+ATPase. Transgenic HKA α_2 production was significantly higher. Previous studies by S. Nakamura demonstrated the dependence of glucose on H-ATPase, a similar proton dependent ion pump located in the intercalated cells of the kidney. A correlating glucose dependence was expected with the H-K-ATPase glucose diseased states model. Through experimentation, this was found to be true. In both wild type and HKA α_2 mice, inducing hyperglycemia caused a down-regulation in the enzymatic activity of H+K+ATPase. In K+ free media, wild type normal NADH read 53.74 ppm, while wild type hyperglycemic levels were 66.49 ppm. In K+ free media, HKA α_2 normal NADH level read 45.13 ppm, while HKA α_2 hyperglycemic read 57.23 ppm. Because of the inverse relationship between NADH levels and ADP, a higher NADH reading correlates to a lower ADP production.

Katherine Drennon and Jessica Jones – Biology for Secondary Education

Raising Awareness of Conservation and Preservation of the Wild Turkey

Mentor / Sponsor: Howard Whiteman

A presentation on the natural history of the wild turkey in Land Between the Lakes was given to Ms. Green's honor biology class at Calloway County High School. The presentation focused on the life cycle, habitat, and species and habitat restoration efforts. It served as a practical extension of concepts that were recently discussed in the classroom. The purpose of this presentation was to make the students think about how conservation efforts locally can significantly impact different species. We wanted to encourage high school students to be more motivated towards conservation efforts and environmental awareness. The students responded positively as demonstrated in the discussion following the presentation. The wild turkey serves as an excellent example of how preservation and conservation efforts can restore threatened populations. Concrete examples like this serve students by showing them how concepts they learn in the classroom are applied in the field. Young people need to be excited about the environment and the impact they have on it. They will be the future leaders of society and their opinions and actions will influence future preservation efforts.

Julia Earl – Water Science

Lethal and Sublethal Effects of Nutrient Pollution on Amphibians

Mentor / Sponsor: Howard Whiteman

Fertilizer application is a widespread practice that greatly affects aquatic ecosystems in a variety of ways. Previous studies show that nitrate toxicity could be a major problem for amphibians at elevated levels, though few studies examine sublethal effects. On the other hand, phosphate has even less toxicity information. To examine nutrient toxicity, laboratory experiments were conducted to measure the response of American Toad and Cope's Gray Treefrog tadpoles to various concentrations of nitrate and phosphate. The phosphate experiments exposed treefrogs to five treatments with concentrations ranging from 0 to 200 mg/L P-PO₄ and lasted for 15 days. Nitrate was examined in both the toads and treefrogs using seven treatments: four with constant concentrations, ranging from 0 to 5 mg/L N-NO₃, and three pulses that simulated the quick increase in concentration to 5 mg/L and slow decline that would be associated with runoff from a rain event. Pulses were timed at different points during development. Phosphate was found to have no effect on any of the lethal or sublethal responses in treefrogs, indicating that phosphate may not be toxic to this species. Nitrate had no effect on toads but did affect the treefrogs. Individuals from the treatment with the pulse late in development had more extreme directional asymmetry than other treatments in calcaneum length. The late pulse occurred during hind limb development; directional asymmetry in a hind limb trait suggests the disruption of the developmental process during the sudden increase in the concentration of nitrate.

Carrie Elliott – Agricultural Education, Justin Parrish – Agriculture Science, and Chris Rodgers – Agronomy

Comparison of De-Topping Methods for Dark-Fired Tobacco with Three Different Bloom Stages and Two Different Heights

Mentor / Sponsor: David Ferguson

This research experiment was designed to help farmers increase net profits by measuring yield differences that occur when tobacco is de-topped at different heights and times. Each plot was 40 feet long and 13.3 feet wide. The cultivar used for this experiment was Narrow Leaf Madole at a population of 4,900 plants per acre. The experiment was arranged in a randomized, complete block design with four replications. The plants were transplanted into the field on June 1, 2006. Treatments included all combinations of two factors: plant stage at de-topping and the de-topping height. The stages of de-topping were: elongated bud, 50% bloom, and 100% bloom. De-topping heights were 12 leaves and 16 leaves. The plants were de-topped in late July and early August. Suckers were controlled by applying butralin and a fatty alcohol mix to each plant. The plants were harvested and housed through the dates of September 15- September 19. The tobacco leaves from each plot were stripped and separated into three quality categories: lugs, seconds, and leaf. The weights were determined for each category within each plot. The data was analyzed using an analysis of variance. Differences between the treatment means were evaluated using the least significant differences (LSD.).

Rachel English – Outdoor Recreation

Powder Puff Pool Tournament: A Service Learning Program

Mentor(s) / Sponsor(s): Kelly Rogers and Mike Gowen

This spring, to fulfill service learning obligations for REC 520 Leisure and Aging, a program was conducted to serve the older population of our community. A Powder Puff Pool Tournament was held at the Calloway County Senior Citizen Center. This tournament offered an opportunity for the ladies at the center to participate in good-natured competition and fellowship, while engaging in an activity they enjoy. Also, they will be challenged cognitively and physically through decision making and skill application. All women that visit the center over the age of sixty five were given the opportunity to participate.

Amanda Enochs – Liberal Arts, Bethany Power – Wellness and Therapeutic Sciences, and Greg Widelski – Exercise Science

Pet University: Owner Responsibility

Mentor / Sponsor: Roger Weis

Pet University is a program directed by the Humane Society of Calloway County to promote pet owner awareness to children. This program is conducted by college students from Murray State University, with these students traveling to local schools and talking to the children about animals and pets. Pet University allowed college students to apply what they have learned in the classroom to the youth of the area. The design of the program consisted of one seminar with three college students speaking to twenty-six second grade students about pet owner responsibilities. The seminar included the college students demonstrating how to care for pets as well as question and answer time for the second graders. We wanted the children to learn that pets are special and need special attention for them to prosper. This also helped the children learn responsibility that can be applied later in life.

Sarah Farmer – Mathematics, Secondary Education and Dustin Smith – History

Atrocities in the Name of Science

Mentor / Sponsor: Howard Whiteman

This presentation will focus on atrocities carried out against humanity under the guise of science. The examples that we have chosen to use are the experiments carried out by the infamous Nazi doctor, Joseph Mengele, the genocide carried out in Rwanda which was brought on by perceived ethnic differences, the experiments carried out by Unit 731, a branch of the Japanese army which paralleled Mengele during World War II, but did so on a much larger level, and the Tuskegee experiments performed on African-American subjects in the United States from the 1930's to the 1970's. In all of these cases, science was used as an explanation and excuse for the heinous acts that were committed, or in Rwanda's case, science provided a way to supposedly differentiate between people of the same race, which in turn led to genocide. We hope to demonstrate that the misuse of science is a recurrent idea, and that societies today are still performing these unjust "science experiments."

Audrey Ferguson – English Education and Spanish

The Roles of the Abuser and the Abused in the Mexican Identity

Mentor(s) / Sponsor(s): Leon Bodevin and Meg Brown

In his essay Sons of the Malinche, Octavio Paz identifies two extremes that determine the Mexican identity: the role of the abused and the role of the abuser. Paz proposes that the Mexican chooses to be either one or the other and that this choice affects all aspects of life. Paz discusses the presence of these roles in 1950s Mexico, along with historical and social reasons for these extremes. Paz's ideas have been supported by other authors and current sociological observations. From religion to the relationship between Mexicans and their government, the extremes of the abuser and the abused still define the Mexican identity.

Chase Fisher – Economics and Political Science

The Casino Effect: Identifying the Social Costs Imposed by Casinos

Mentor / Sponsor: David Eaton

This presentation examines the problem of the economic multiplier that is used in the initial evidence provided by casinos to show that they will provide an economic benefit to a particular community. In particular, this presentation will review the negative externalities that should necessitate a decreased multiplier; thus leading to much lower economic benefits than are claimed by casinos. The presentation will focus on such concepts as criminal activity, substitution effects, and consumer proximity, and how they should affect the overall calculation of economic benefits. By reviewing existing literature and evidence, this presentation will attempt to provide better insight into a more accurate cost/benefit analysis to be used by communities that are considering the addition of a casino.

Brian Flowers, Holly Fuqua, and Kellye Smiley – Elementary Education

Plants and Animals

Mentor / Sponsor: Howard Whiteman

As a group project, we will be going to an elementary school classroom to present a brief lesson to the students in the class. We will be teaching a short lesson on animals and also one on plants. We will be discussing specific species and we will also have an activity to get the children involved. We will be planting a flower as a demonstration to show the students how they can give back to the environment.

Annette Fowler – Chemistry

Trace Level Analysis of PBDEs in Fish Tissue Extracts Using GC-ECD

Mentor / Sponsor: Bommanna Loganathan

Polybrominated diphenyl ethers (PBDEs) are one of the additive flame retardants widely used in plastics, textiles, and in electronic appliances including computers and televisions. Widespread use of PBDEs have resulted in environmental contamination. Exposure to PBDEs can cause harmful effects in wildlife and humans. Limited data is available on the levels of these compounds in fish tissues and on human exposure via consumption of contaminated fish. In this study, a gas chromatograph equipped with electron capture detector (GC-EDC) was calibrated using known concentrations of PBDE standards. Response factors and method detection limits were determined for 12 PBDE congeners. Fish tissues (collected from the Atlantic coastal waters) were analyzed for PBDE congeners and the analytes were quantified using an Excel program. The individual and total PBDE concentration data for each fish species were tabulated and compared with literature PBDE data of fish from other regions in the United States. This study provides baseline data on PBDE levels in the fish from Atlantic coastal waters off Savannah, GA. Future monitoring studies on PBDEs is essential in order to determine bioaccumulation, biomagnification and effects of these compounds in wildlife and humans. Results revealed that PBDEs 47, 99, 100 and 28/33 were frequently detected in fish samples. Inter-species and intra-species differences were noticed. Accumulation pattern of the PBDEs in fish tissues showed the following order 47>99>100>28/33>66.

Stephanie Galla – Wildlife Biology, and Steven Taylor – Sociology

Star Wars Technology: Far-Flung Fantasy or Reality?

Mentor / Sponsor: Howard Whiteman

The science fiction of today becomes the technology of tomorrow, and the contributions of far-flung futuristic fantasies of the Star Wars universe are quickly becoming reality. If successful, many of these technologies will revolutionize our world, making us faster, more communicative, and deadlier. Predicting technological advancements is difficult, but fantasies often work as catalysts, combining creativity and technology to form tomorrow's applications. We researched four of the major technologies from the Star Wars universe, analyzed their fictional processes versus alternate theories, and investigated the movie magic behind them. For finding relevance to our day and age, we sought out their real-life counterparts, whether they are only on paper or already functioning in contemporary society. Many of the explanations given by canon sources -- the approved scripture of the Star Wars universe-- are physically implausible (e.g. repulsor lift's anti-gravity) and that others are conceivable or even in use today (e.g. holographic imaging). The changes in science and our world due to these amazing advances will be great: blasters in the form of direct-energy weaponry will revolutionize urban warfare, light sabers will change manufacture and crime, repulsor lifts will yield faster and faster terrestrial transport, and holographic imaging will be the next step in the ultimate goal of video conferencing --being there without being there. Art imitates life and life imitates art, and what is at one moment a flight of fancy will soon become a way of life.

Stephanie Galla and Paul Gradie – Biology

Taxonomic Status of Large-Leafed Mulberry in Western Kentucky

Mentor / Sponsor: Dayle Saar

There are two commonly recognized species of mulberry in the commonwealth of Kentucky: native red (*Morus rubra*) and non-native white (*M. alba*). Still biologists have been puzzled by the large-leaved mulberry trees observed growing in the Jackson Purchase area. The leaves, which range in size from 23-38 centimeters, have been collected and are being investigated for their genetic components in order to identify this leaf abnormality and give the proper taxonomic title to this species. Herbarium specimens from surrounding states have been compiled to reveal a clearer range of this large-leafed mulberry. This search indicates that this mulberry also grows in central Kentucky, southwestern Missouri, northwestern Tennessee, and southern Illinois. DNA extraction, polymerase chain reaction (PCR), and gel electrophoresis are being used to locate certain molecular markers in the large-leafed mulberries that will be compared to white and red mulberry. These markers are being sequenced to determine the order of nucleotide bases in the DNA. Results will be compared to similar sequences in GenBank an international DNA data base. The significance of this research is clear: it is important to know the true status of these unusual trees. They could be genetic variations of red or white mulberries. It is also possible that they are a non-native species that has not been reported to grow in the US, but has escaped cultivation and begun reproducing on its own in wild habitats. If the latter is the case, it needs to be documented and conservation personnel will be alerted.

Holly Gibbs – Accounting

Statement 158

Mentor / Sponsor: Tim Miller

On September 29, 2006, the Financial Accounting Standards Board issued FASB Statement No. 158, Employers Accounting for Defined Benefit Pension and Other Postretirement Plans An Amendment of FASB Statements No. 87, 88, 106, and 132R. The reason for issuing Statement No. 158 is because there have been concerns from users of financial statements that indicate that the standards stated in Statements No. 87, 88, 106, and 132R fail to produce fully understandable financial statements. This is mostly because they do not require an employer to provide recognition in comprehensive income of events that occurred during the period. One of the main changes in Statement 158 is the requirement of an employer to recognize the overfunded or underfunded status of a defined benefit postretirement plan as an asset or liability in its statement of financial position and also to recognize changes in that funded status in the year in which the change actually occurs. Additionally under Statement 158, employers will now be required to measure the plan s assets and its obligations that determine its funded status as of the end of the employer s fiscal year. Statement 158 applies to pension plan sponsors that are public and private companies and to nongovernmental not-for-profit organizations.

Ashley Hagan, Nicole Gerlanc, and Todd Schoborg

*Microsatellite Analysis of a Polymorphic Population of Tiger Salamanders, *Ambystoma tigrinum**

Mentor / Sponsor: Howard Whiteman

The ultimate goal of this study is to assess fitness trade-offs and the evolutionary maintenance of polyphenism in a population of Tiger Salamanders, *Ambystoma tigrinum*. An understanding of the mechanisms maintaining the polymorphism would allow prediction of environmental conditions that favor each morphology or to model changes in the population structure that would occur with climatical perturbation. To begin we assessed six microsatellite sequences for allelic variation and the ability to assign parentage to known parent/offspring combinations. Sexually mature male and female salamanders were placed in mesh clutch bags during the breeding seasons of 2005 and 2006 at the Mexican Cut Nature Preserve in Colorado and allowed to breed. Tissue samples from the known mother and presumed father, and a portion of the eggs laid in the clutch bags were then collected. Twenty-five clutches from both metamorphic and paedomorphic individuals were used in the analysis. To date, we have extracted DNA from 83 individuals and assessed the allelic variation for 25 breeding pairs and 30 individuals from the general population. Results regarding the allelic variation of the population and attempted parentage assignment will be discussed.

Ebone` Hatcher – Psychology

Applying the Material Appropriate Processing Framework to Learning Through Video and Text

Mentor / Sponsor: Paula Waddill

This study applies a material appropriate processing (MAP) perspective to the study of embedded questions in expository audiovisual and text presentations. The MAP approach postulates that expository material naturally elicits more processing of details than relationships; therefore, encoding strategies that elicit processing not spontaneously elicited by the material will particularly benefit memory. I predicted that participants viewing a video or reading a passage containing expository information with no embedded questions should remember more detail than relational information, and embedding relational questions should significantly enhance recall of relational information. Previous literature on embedded questions has demonstrated that questions embedded throughout text typically enhance memory for targeted information and sometimes for similar types of non-targeted information. Consequently, I anticipated that detail questions might enhance recall of targeted details but not of non-targeted ones. I also explored the effect of pacing on recall. Some researchers have found that quickly changing camera angles reduces comprehension; others contend that varying angles increases engagement. I investigated pacing effects by presenting the video with either varying camera angles or a single angle. Embedding detail or relational questions in a video lecture shown from single or multiple camera angles increased memory for the targeted information. Recall of the some types of non-targeted information also showed some enhancement.

Tiffany Hedrick – Biology/English, and Courtney Thomason – Wildlife/Zoological Conservation

Of Mice and Men: The Effects of Anthropogenic Disturbance on Peromyscus leucopus

Mentor(s) / Sponsor(s): Terry Derting and Ken Fairbanks

Increased anthropogenic disturbance of natural habitats can create greater physical, nutritional, and social stress than wild animals would normally experience. Prior research, however, indicated that white-footed mice (*Peromyscus leucopus*) in disturbed habitat patches experienced less moderate-term stress and had stronger cell-mediated and weaker humoral immune responses than mice from undisturbed patches. Our first objective was to determine whether white-footed mice in disturbed patches also experience less long-term stress than mice from undisturbed habitats by examining fluctuating asymmetry (FA). In winter we found increased FA in mice from undisturbed habitats, possibly resulting from increased nutritional stress. In summer, however, we found increased FA levels in mice from disturbed habitats, which we attribute to increased environmental stressors, such as pesticides, herbicides, and human activity. Our second objective was to examine stressors potentially associated with anthropogenic disturbance that may affect immune function. We hypothesized that social stress (high population density) takes a larger toll on the immune system than nutritional stress (low protein). Mice fed a low protein diet (nutritional stress) had a significantly weaker cell-mediated immune response than their counterparts fed a high protein diet. Male mice housed in pairs (social stress) mounted a significantly weaker humoral immune response than those housed individually. Because virtually all emerging infectious diseases that appeared within the past decade are associated with some form of human activity, it is likely that increased stress and decreased immunocompetence may lead to a greater likelihood for *P. leucopus* and other wild animals to contract and subsequently spread infectious diseases.

Meagan Hensley – Liberal Arts and Kayla Reno – History

Historic Preservation

Mentor / Sponsor: Howard Whiteman

Museums and the fields of conservation, Curation, and Historic Preservation are a product of the 20th Century. Despite the fact that these are relatively new, the evolution of preservation has grown tremendously over the last few decades. Museums now have a better understand on the effects of outside elements on museum artifacts and are taking measures to protect them, especially when dealing with fragile archival materials. For example, in the 1960's archival material was housed in boxes which included acid pulped fibers with high residual lignin content and no alkaline reserve. Conservationists now know that this method of storage provides a very unstable environment for the artifacts. In the next few decades this began to change, especially with the new standards passed by the Library of Congress. An alkaline reserve of 3-5% was added throughout the pulped paperboard. This was added to neutralize the deterioration by-products being given off by the storage box and the materials stored in the box. In 1980 the term "archival" was specified as being a material which was lignin-free, sulfur-free, alkaline pulped and containing an alkaline reserve. The need for molecular traps in paperboard to deal with both air-born pollutant gases and the by-products of deterioration has been confirmed by investigative work and curators and archivists have continued to learn more about the effects of various acid and alkaline elements on archival material. Our group will further investigate the use of molecular traps, the effects of acidic gases, and also pollutant sources in relations to archival materials and artifacts.

Lauren Hines – Liberal Arts/Spanish

The Decline of Bullfighting in the 20th and 21st Centuries

Mentor / Sponsor: Leon Bodevin

Bullfighting has long been a very important part of Spanish culture and history. In recent years, however, this sport has seen a large decline in support. The most recent manifestation of the Spanish disinterest in bullfighting is the closing of the last bullring in Barcelona. The support of bullfighting began to diminish in the 20th century, with cultural, social, economic, historic, and regional aspects of the national culture contributing to the decline. Bullfighting is one of the main cultural icons of Spain. Although many groups believe that it is cruel and inhumane, the loss or possible ban of a sport with such strong ties to Spanish history and culture would be devastating to the Spanish tourism economy and to the preservation of their cultural history. This paper will concentrate on not only the reasons for the decline of bullfighting and the possible effects, but will also include the origins of bullfighting and a brief history.

Lauren Hines – Liberal Arts/Spanish

The French Electoral Process and the 2007 Presidential Election

Mentor(s) / Sponsor(s): Staci Stone, Theresa Saint Paul, and Farouk Umar

This presentation will be an examination of the French political system with special attention to the role of the President in the government. The 2007 French Presidential Election will help determine France's role in the international community and will affect future relations with the United States. I will present the various parties represented in the election and the forerunners of each party and examine what the election of each candidate could mean for France's foreign relations policy and how it might affect their standing in the international community.

Lauren Hines – Liberal Arts/Spanish and Adam Moore – International Affairs

A Comparison of the Use of Alternative Fuels in the United States and Worldwide

Mentor / Sponsor: Howard Whiteman

In our project, we will research alternative fuels and focus on those with a greater capacity to be used as a consumer product in the future. Chemical fuels, renewable energy, and other forms of alternative fuel will be discussed within the project. This will provide a basis for our study of the use of alternative fuels around the world, with focus on the countries of Iceland, Brazil, and the United States. By learning about the use of alternative fuel across the world, we can then look at our own resources and try to provide answers to as why the United States is not as reliant on alternative fuel as other countries and what steps we can take individually and as a nation to promote the use and innovation of alternative fuels. This project will not only use scientific findings about alternative fuel to better understand the choices available, but will also incorporate political, economic, and geographic factors in determining why some countries are greener than others.

Jason Hinson – Political Science

A Matter of Interpretation: The United States and International Law

Mentor / Sponsor: Farouk Umar

In a world where terrorism has reshaped the definition of war, the United States stands in a position above international law. In regards to the Geneva Conventions, the Rome Statute of the International Criminal Court, and the Kyoto Protocol, the Bush Administration has used clever interpretations and methods such as bilateral agreements to achieve the best interests of the United States at the price of not following international law. This study will explore the foreign policy of both the Bush Administration and former administrations to illustrate the movement away from the law by the United States. These actions present serious repercussions that give force to the idea that America must change its direction and provide support for international institutions in order to maintain long-term goals.

Laura Holt – English

Day Only of the 428-eron: After the Style of the Decameron and Heptameron

Mentor / Sponsor: Barbara Cobb

The English 428, Continental Renaissance Literature, class is producing a frame tale and a series of stories written by members of the class in imitation of the style and content of two great works of the Continental Renaissance, Boccaccio's Decameron and Marguerite de Navarre's Heptameron. In both Renaissance sources, a fictional group is trapped - in the first waiting out plague, and in the second, flood -- and tell stories as a way to pass the time. Our frame places us in the basement of Faculty Hall during a tornado warning; a locked or blocked door prevents our exit, and we decide to tell stories to while away the time. We will present our tale, called Day Only of the 428-eron, including our original stories.

Patrick Hopp – Spanish and German with Secondary Teaching Certification

Attempting to Defy Death: A Comparison of “Macario” and Der Gevatter Tod”

Mentor(s) / Sponsor(s): Mike Waag and Reika Ebert

Can Death be defied? Most people accept their fate; and when Death comes to collect them, they realize that nothing can be done to change the fact that they must leave this world. This paper is a comparison of two literary works, Macario written by B. Traven, a mysterious Mexican novelist, commonly thought to be from Germany, and Der Gevatter Tod, a folk tale found in the Brothers Grimm collection Kinder-und Hausmärchen. Both stories deal with protagonists that, through an encounter with the allegorical figure of Death, gain power to be able to cure moribund people. When this power puts these two men in circumstances that can have adverse affects on their future, they aim to defy Death so that they can control their destiny. The differences and similarities that the two stories share will be discussed in this paper.

Christopher Hopper – English

The Second Life of Learning: Exploring the Use of Multi-User Virtual Environments for Higher Education

Mentor / Sponsor: Sue Sroda

This project examines the developing presence of higher education in the multi-user virtual environment Second Life and the feasibility of implementing a Second Life team at Murray State University. For this project, an examination of Second Life projects developed by other universities will be used for comparison. Training resources and documentation will be developed in cooperation with Murray State University staff, culminating with a report for the Murray State University Computer Technology Learning Center (CTLT). Second Life property and documentation will be developed for future university use.

Daniel Hughes – Organizational Communication

All Shuffle Aboard: A Service Learning Program

Mentor / Sponsor: Kelly Rogers

In 2000, 12.4% of the American population was over 65. On a daily basis 5,570 adults celebrate their 65th birthday. This growing population needs new and creative ways to promote their physical health and socialization. This semester each student in my Rec. 520 class conducted a fifteen hour program focused on this senior population. This program's purpose is to promote physical health, socialization and friendly competition by playing shuffle board. The Murray Calloway County senior citizens center has a population of adults that are 65 years of age or older. At first, the shuffle board tournaments did not go over well with a beginning turnout of 6 people. But, once we made this activity a weekly event, the popularity of the game grew to new heights. The Activity Theory explains why this type of program is important among seniors. Not only does it promote physical health and socialization but it allows seniors to form new relationships and build new identities and roles for themselves through competition.

Chungen (Lester) Hung

Web 2.0

Mentor / Sponsor: Victor Raj

The internet is changing the way we interact with other people and the computer. We are now facing the shift to Web 2.0. Several websites are changing into Web 2.0. The concept started to take shape during a conference hosted by O Reilly and MediaLive International. There are several components that make up Web 2.0. Such as rich internet applications, service oriented architectures, and the social web. The web programming languages that were used to create Web 2.0 includes cascading style sheets, extensible markup language, asynchronous JavaScript, RSS feeds, among others. Web 2.0 has several advantages; one of which is user collaboration. Content is created and managed by the users. Since it is not controlled by a publisher, everyone work can be published. In addition, dynamic web advertisement is more effective as it can target specific users with products or services that are of interest to the specific user. For the music and movie industry, DRM protected media files can be distributed to users who can purchase the music or movie. Examples of Web 2.0 web sites are: YouTube, Facebook, Yahoo, Wikipedia, Skype and others. YouTube and Facebook gained popularity in just over a year, and their value increased exponentially. Wikipedia s contents are all generated by users across the globe; therefore articles are available in numerous languages. Skype is very successful in utilizing the users to transfer voice data over the internet without the need to set up servers of their own.

Antonio Frank Irby – Elementary Education

The Fishing and Canoeing Ability of Local Named Waterways

Mentor / Sponsor: Howard Whiteman

What I would like to accomplish with this project is to document the ability to fish or canoe the various waterways within a 20 mile radius of Murray, KY. The ones I am mainly interested in are the named water ways that one sees when driving over a small/large bridge around Murray. Like the ones that have green street sign type names. I feel that this information could be useful to fishermen and outdoor recreation individuals. I want to document this project by photographing areas and tracking water levels and different fish that are found.

Sam Jackson – Economics

Economics of Ticket Scalping and Regulation

Mentor / Sponsor: David Eaton

Ticket scalping is the practice of purchasing tickets at or below their face value and reselling them at a higher price. While most frown upon ticket scalping, economists view reselling as a way of allowing the market to decide the value, allocating tickets to those who desire them the most. Unfortunately most states do not agree with the economists and impose anti-ticket scalping laws, which hinder free market transactions. This paper will examine the economics behind ticket scalping and some of the anti-scalping laws and see what, if any, impact they have.

Rachael Jaenichen – Public Relations and Organizational Communication

What is the Relationship Among Wedding Planning, Gender Communication, and Conflict Management?

Mentor(s) / Sponsor(s): Lou Davidson Tillson and Mark Malinauskas

The purpose of this study is to determine and discuss the relationship among wedding planning, gender communication, and conflict management. Using existing scholarly and empirical research, each of the three variables was independently examined. Following the literature review, an analysis of the relationships between the variables was made using both systems theory and communication accommodation theory. Ultimately, the wedding planner must successfully organize and execute the event while merging masculine and feminine styles of communication.

Emmy Lou Kacer

Charismatic Reformation: The Spiritual Re-conquest of Latin America

Mentor / Sponsor: Leon Bodevin

Most Americans falsely assume that all Latin Americans are Catholics because for centuries Catholicism was the only major religion in Latin America. However, what most people do not know is that the face of religion in these nations has been changing since the latter half of the twentieth century. One researcher claims that conversions from Catholicism to Protestantism in Latin America during the twentieth century exceed the Reformation in Europe during the sixteenth century. This information makes research into this topic an important endeavor. I will investigate the following question: Why and how has the charismatic faith swept across Latin America? This answer must include an explanation of what the "charismatic" faith entails, and how it is distinguished from the broader category of "Protestantism," in addition to how it differs in the theology and practice of Catholicism. I hope to negate some of the political explanations for the spread of the charismatic faith by establishing the Latin American people's need for this faith at this particular time in their chaotic societies. I believe the readers will see that Latin Americans are receptive to this movement because the simple faith of the charismatic message appeals to them, as opposed to believing some of the political explanations that insist that this faith is being imposed on the Latin American people like Catholicism was many years ago.

Emmy Lou Kacer – Spanish

Gabriela Mistral's "Tala" as a Book of Intersections

Mentor / Sponsor: Mike Waag

In 1945, the Nobel Prize was awarded to Gabriela Mistral, a poet and teacher from Chile. Her work merits further study in order to understand why she was chosen over the numerous other contenders for this prestigious award in literature. *Tala*, a collection of poems published in 1938, exemplifies all of the literary elements that characterize Gabriela Mistral's work. Some of these characteristics include Mistral's use of symbolism, metaphors and a simple poetic language. This study will place *Tala* between two other famous works by Mistral, *Desolacion* (1922) and *Lagar* (1954). By doing this, it will show how *Tala* serves as an intersection for the literary style and themes of the preceding work, *Desolacion*, and the following work, *Lagar*. By focusing on literary characteristics from *Tala*, one can understand why Mistral's work remains popular throughout the world.

Erin Kelly – French

Teen Pregnancy in France and the United States

Mentor / Sponsor: Theresa St. Paul

Teen pregnancy remains an important issue in politics at every level around the world. It is largely regarded as a public health issue, but as every country's approach differs, so do the results. Within the western world, France and the United States represent two contrasting approaches that have yielded corresponding data. The forces at work are interwoven and constantly changing, yet current trends stem from historical values. Teens are influenced by legislation, religion, school, parents and media, which can provide conflicting information. By examining another country's sociohistorical values and practices, and creating an open discussion on the topic of unintended pregnancy, it is hoped a more effective method of prevention can be created for American women.

Marilyn Kennon – Sociology

Wasting Away... Underground

Mentor(s) / Sponsor(s): Lillian Daughaday and James Lavalley

Morris Berman in his book *The Twilight of Culture* argues that the rise of corporate values and consumerism are major forces in the decline of our culture and civilization. With the dominance of corporate pervasiveness, where everything is a potential object for sale and where no space is left untouched by advertisements, the body has become another frontier for marketing. Thus, we see the objectification of the body and its link with eating disorders. This paper will examine the social context in which eating disorders occur and focus upon the role of the Internet and its pro-ana websites while discussing its role in advertising and selling body image.

Niaz Khadem – Spanish Education

“Versos Sencillos” as Transition Poetry between Romanticism and Modernism

Mentor / Sponsor: Mike Waag

The first two major literary movements in Latin America were Romanticism and Modernism. Jose Marti, poet, writer, and renowned Cuban independence leader has been recognized, mostly for his contributions in prose, as a precursor to the Modernist movement. This study will focus on his modernist innovations in poetry, specifically "Versos Sencillos". By exploring the unique circumstances of his life, this study will show how "Versos Sencillos", a work basically Romantic in theme and style, embodied the essence of Modernist ideals.

Jennifer Lacewell, Uger Oner, Michael Schoell, and Chase Venable

The Demand for a Murray State University Education

Mentor / Sponsor: Martin Milkman

When students graduate from high school, they must make the critical decision about the next stage of their lives. Hopefully, they will decide to attend college at Murray State University. Many factors are included in the decision to attend Murray State University, such as tuition prices, the cost of dorms, meal plans costs, and the amount of scholarship money awarded. This paper estimates the demand for a Murray State Education with variables dating from 1980-2005. It includes a regression analysis based on these variables and others including other schools tuition prices, Kentucky per capita income, and unemployment rates.

Ryan Leach – Psychology

The Dehumanizing Effects of Prejudice and its Cultural Implications

Mentor(s) / Sponsor(s): Meg Brown and Marcie Johnson

"The Three Burials of Melquiades Estrada" is a very influential and pertinent movie. Today's world is full of prejudice against Mexicans, and this issue is dealt with head-on in the film. The movie is so significant because of the similarity in the character's attitudes with real American's attitudes. Light is shed on our negative stereotypes, and this movie begs for us to reconsider our views.

Jeffrey Lester – Political Science

The Long Road: WTO Requirements a Step Forward for the Rule of Law in China

Mentor / Sponsor: Michael Basile

As a condition of its membership in the World Trade Organization, the People's Republic of China assumed many obligations, including the fair and uniform application of its laws. While change in the PRC has been and will continue to occur in political, economic, and social arenas, the focus of this study is on how these changes will influence the development of the legal system. The study's purpose is to evaluate the ability of WTO-imposed reform to contribute to the establishment of the rule of law in China. Furthermore, it will discuss possible effects of this reform in both the short-run and the long-run. The mandates of the WTO will prove to be insufficient to bring about the kind of fundamental reorientation necessary to produce true rule of law in China. However, it will undoubtedly contribute to the long-term development of a more legitimate and efficient legal system and thus move the country further down the long road that leads to true rule of law.

Jonathan Lewzader – Chemistry and Pre-Pharmacy

Development of New Synthetic Strategies for the Synthesis of N-heterocyclic Scaffolds

Mentor / Sponsor: Edie Banner

An unexpected outcome of a reaction unveiled a new method to obtain N-Cbz-L-prolinol from N-Cbz-L-glutamic acid in one step with the retention of stereochemistry. This reaction warrants further investigation as this compound is an important chiral N-heterocyclic substructure (pyrrolidine) found in numerous natural products that exhibit bioactivity. This compound and derivatives thereof can be quite costly to synthesize, thus optimization of this method would allow for the efficient and inexpensive production of prolinol derivatives from inexpensive amino acids. Investigations into the scope of this reaction have been undertaken to develop N-heterocyclic scaffolds which can be utilized in the synthesis of natural products.

Jessica Lindley – Pre-Veterinarian

The In Vitro Binding Effectiveness of Selected Pathogens Using Phyllosilicate Clays

Mentor / Sponsor: Dale Barnett

Our study is testing a new product comparable to Platinum Performance's Bio-Sponge. We are conducting tests to determine adsorption properties of these products and their ability to bind pathogens such as salmonella, clostridium, and E.coli. These pathogens are associated with enterocolitis and other gastro-intestinal problems in horses, dogs, and humans. Bio-Sponge by Platinum Performance helps decrease damage caused by pathogens by binding to the toxins they produce. We will determine whether this new product is as effective as Bio-Sponge or if it is more effective at binding the endotoxins associated with the Clostridium organism as well as Salmonella and E.coli. To test adsorption properties of these products, we perform bacterial testing against microbes, toxicology testing against toxins produced by the pathogens, virology testing in vitro using ELISA (Enzyme-Linked ImmunoSorbent Assay) and EAA (a chemiluminescent Endotoxin Activity Assay) tests. We will make serial dilutions creating suspensions of the respective equine strain of bacteria. We will weigh specific portions of the products to be tested and add them to the suspensions. These suspensions are plated and concentrations of bacteria read. Using the electron microscope, we will observe each bacterium to compare the tested products binding effectiveness. Each sample will be tested for their toxin binding ability using the ELISA test kits. These tests will determine whether the new product is comparable to Bio-Sponge or if it surpasses the ability of Bio-Sponge to bind to the toxins that cause detrimental effects to the well being of the equine, canine, and human.

Stefanie Long – Exercise Science, Wellness

Diabetes and Exercise

Mentor / Sponsor: Pam Rice

Diabetes is a chronic metabolic condition in which the body produces too little insulin or cannot use available insulin efficiently. Diabetes can be a very debilitating condition if untreated and can lead to blindness, kidney disease, and necessary amputation. Numerous studies have confirmed that exercise plays a huge role in positively affecting an individual with diabetes. Exercise helps a cell become more insulin sensitive- (lowers medication requirements), transports glucose in a cell faster, helps improve cholesterol, helps as a stress reducer, lowers BP, and helps keep the body in good shape and ideal weight. There are several circumstances when exercise is contraindicated with diabetic patients so it is important to monitor diabetic patients closely. There is a certain exercise prescription recommended for individuals with diabetes. The main components of this plan should include aerobic endurance, strength training, and flexibility exercises.

Nathanial Blaine Luffman - History

Concrete Jungle: The Jamaican Struggle with Independence (1962-1986)

Mentor / Sponsor: Bill Schell

The second Great War precipitated the complete destruction of nineteenth century imperialist policy that is epitomized by the transfer of European power to the non-European world, and subsequently the Westernization of this latter world. Overshadowed by the fight against fascism, lies the story of an island's struggle to find a voice, to rise above a history defined by chattel slavery and crown colony oligarchy, to find freedom, and to define that freedom in a Jamaican context.

Noe Madrigal – Spanish

Lope de Vega: Poems That Reflect His Life

Mentor(s) / Sponsor(s): Mica Howe and Meg Brown

Lope de Vega was a writer from the Golden Age of the 16th Century in Spain. His life was filled with tragedy. He lost his parents at a very young age, and he started composing poems around the age of ten or twelve. He wrote poems that were both pleasant and tragic using eloquent language. Lope de Vega's life was also filled with adventures: he was part of the Invincible Armada, and also he married twice and had many lovers. He wrote poems to his mistresses, but at the same time some of these poems brought him problems with the law. He wrote poems to his loved ones, his wives, his lovers, and his son and daughters. Tragically most of them die during his lifetime. His own funeral was like that of a king; it lasted three days, and the city mourned for this Spanish writer of the Golden Age. This presentation will explore some of the poems that reflect his tragedies and his love.

Dana Manley – Nursing

Increasing Physical Activity in Middle School Students: A Pedometer Project

Mentor / Sponsor: Pam Rice and Patricia Cowan

Decreased physical activity levels are one of the leading risk factors related to cardiovascular disease in the United States. Cardiovascular disease, diabetes, and hypertension, once seen primarily in adults, are now affecting children and adolescents. Physical activity levels tend to decrease in adolescence and progressively decline into adulthood. Effective interventions aimed at increasing physical activity levels in adolescents are warranted; therefore, the purpose of the proposed study is to determine whether a school-based pedometer intervention program will improve self-efficacy, physical activity, aerobic fitness, and prevent weight gain in sixth and seventh grade middle school children. The proposed study will utilize a quasi-experimental design of children in sixth and seventh grade with similar demographic compositions. Variables to be measured consist of anthropometric measures, aerobic fitness, physical activity levels, and self-efficacy levels. Baseline data will be collected in both schools prior to the intervention of the program. The intervention program will consist of providing students with pedometers, physical activity education, and replacing the 10 minute daily break time with 10 minutes of moderate to vigorous physical activity. Self-efficacy, physical activity levels, aerobic fitness, and anthropometric measures will then be reassessed and compared between the two schools. The proposed study will make a significant contribution to the body of knowledge regarding school-based interventions using pedometers as a tool to improve self-efficacy, physical activity, aerobic fitness, and prevent weight gain in middle school students. The program provides a cost effective intervention that is easy to implement with the potential for broad applicability.

Katie Marks – Psychology

The Adversarial Assumption of Law and Psychology

Mentor / Sponsor: Laura Liljequist

The relationship between law and psychology has been described as adversarial due to conflicting goals, methods, and values. No study was found in PsychInfo or Buros Center for Testing that has measured this. The research goal was to create a reliable and valid survey, which measured attitudes on the goals of truth vs. justice, the method of objectivity vs. advocacy, and the values of creativity vs. precedence. The 30-item survey was piloted on 105 undergraduate volunteers. Alternate forms reliability coefficients for the six sub-scales ranged from .73 to .83 with a median coefficient of .75. Factor analysis was used to establish validity. An extension of this study will measure if and at what point during the undergraduate career the student s diverge in their values. It is expected that law student's will show positive attitudes towards justice, precedence, and advocacy, whereas psychology students will show positive attitudes towards truth, creativity, and objectivity.

Lucas Miller, Eric King, and John Shelby – Occupational Safety and Health

Ergonomic Review of Seat-Pan Manufacturing

Mentor / Sponsor: Tracey Wortham

This presentation will include an analysis of ergonomic issues within a seat-pan manufacturing company located in Western Kentucky. Three members of OSH 663 Applied Ergonomics visited the plant to evaluate potential ergonomic risk factors in three specific tasks. Two of the tasks involve lifting and moving equipment from a welding cell used in the making of individual seat-pans. The third task involves the pushing and pulling of a cart loaded with the finished seat-pan products. Ergonomic analytical tools such as the NIOSH Lifting Equation, Liberty Mutual's Lifting/Lowering and Push /Pull Tables, along with a Biomechanical 3D analysis were used. In addition, a discomfort survey was distributed to workers to evaluate the risk potential within these tasks. An overview of the findings, along with recommendations for reducing ergonomic hazards will be presented.

Adam Moore – International Affairs

The Great Arab Failure: Can Pan-Arabism Ever Succeed

Mentor(s) / Sponsor(s): Michael Basile, Farouk Umar, and Chris Bierwirth

The fall of the Ottoman Empire at the end of the First World War left many uncertainties for the future direction of the Arab World. One ideology which would emerge was that of Pan-Arabism, the belief that the Arab peoples and nations could be united. Hussein bin Ali, Sharif of Mecca, and his son Faisal were the first active proponents of the movement. As the Pan-Arab ideology matured, organizations such as the Arab League were created as a means to formulate and implement strategies for the unification of the Arab World. Gamal Abdel Nasser of Egypt became the hero of Pan-Arabism in the 1950s, and united his country with Syria to form the United Arab Republic. This bold move toward Arab unity did not last, however, and would foreshadow the future of the Pan-Arab movement. As the idea of nationalism and statehood become more ingrained in Arab society with each generation, it is unlikely that such an effort of transnational unity will happen again. There still remain proponents of Pan-Arabism today, the popular figurehead being Muammar al-Gaddafi of Libya. As long as conflict and hardship remain in the Arab world, there will still be those who look back to the dream of Nasser for inspiration. Though there may be a resurgence of Pan-Arabism in the future, there is no guarantee that the West would allow any action to take place.

Monica Morrison – Biology and Chemistry and Brad Medling – Biology

The Distribution of Renal H⁺K⁺ATPase in OMCD of Wildtype Mouse Model as Shown by Immunocytochemical Staining

Mentor / Sponsor: Suguru Nakamura

The regulation of the acid/base balance is known as homeostasis, and the kidneys play an important role in maintaining this balance. Acid secretion (proton secretion) takes place in epithelial cells of the kidney and is vital for the reabsorption and regeneration of bicarbonate that is used in metabolic acid production. We are currently studying renal H-K-ATPase in the outer medullary collecting duct (OMCD). The OMCD is very important because it is the last place in which the regulation of the acid/base balance can take place. H-K-ATPase is a transporter which requires ATP in order to function. Its purpose is to reabsorb potassium (K) and secrete protons (H⁺), so it, therefore, provides a mechanism for K conservation, while at the same time decreasing the acidity of the body. We are determining the density and distribution of the active, functioning transporters in OMCD via the method of immunocytochemical staining. A primary antibody is applied to the OMCD and binds to H-K-ATPase. A secondary antibody then binds to the primary antibody and will fluoresce when viewed under a confocal microscope. We then look at the distribution of this fluorescence, and therefore, the distribution of the H-K-ATPase. This research project will allow us to determine the role of the H-K-ATPase in renal tubular epithelial cells, as well as understand the broader physiological significance of the regulation of homeostasis, in turn providing a deeper understanding of the molecular basis for ion transporter control of acid (proton) secretion. Comprehension of the function and location of H-K-ATPase is critical in understanding associated physiological conditions, such as hypokalemia and metabolic alkalosis.

Holly Mowery – Chemistry and Biology

Sodium and Potassium Concentrations in Murray Wastewater Treatment Plant Samples

Mentor / Sponsor: Bommanna Loganathan

Sodium (Na) and potassium (K) are naturally occurring chemical elements that are essential for plants and animals, including humans. Na and K containing compounds are widely used in food, drugs (pharmaceuticals) and industrial applications. Discharges of human wastes and industrial sources contribute to increased levels of these chemicals in wastewater that are treated and discharged into streams, rivers and lakes. Although Na and K are beneficial to plants and animals, at higher concentrations, these chemicals cause negative effects. Understanding the levels of these elements is important to assess exposure levels and prevent harmful effects. To our knowledge, there exists no study dealing with Na and K levels in wastewater treatment plant samples from Murray, KY. The objective of the present study was to determine the concentrations of Na and K in wastewater samples from the Murray wastewater treatment plant (WWTP), collected during different seasons. Influent, effluent, and during treatment process samples were collected and analyzed for Na and K using standard methods. Results revealed that Na and K concentrations were relatively higher in influent than in effluent samples. In general, Na and K concentrations varied during different seasons. The concentration data correlates well with the population fluctuation in Murray during different seasons.

Jenny Naes – French

French Intellectuals During WWII: From Pacifism to Activism

Mentor / Sponsor: Janice Morgan

When most people think of philosophy the names that often come to mind are of Greek origin: Plato, Socrates or Aristotle. However, in the 19th and 20th centuries, the French became very important in the realm of philosophical thought. With war constantly playing out in the background, French intellectuals spent a vast amount of time dissecting the workings of society and the ideas of class and equality. Particularly after World War I, most philosophers adopted a strictly pacifist point of view where politics were concerned. Violence, confusion and death turned them away from the political world. However, the threat of fascism was becoming more and more real during the 1930s. When World War II broke out, many philosophers were forced to make a decision between this pacifism and political engagement. This presentation focuses on the developments of Jean Paul Sartre and Simone de Beauvoir from passive intellectuals to engaged existentialists.

Tracy Nearhoof – International Affairs

The World Bank and Morocco: Will a Standard Policy Work?

Mentor / Sponsor: Michael Basile

In this study, I will analyze the current situation of the World Bank and its policies, their effectiveness, and use the example of Morocco to see whether or not the assumptions made in reference to the cultures are the reason plans fail. Some effects of the standard Structural Adjustment Plans(SAPs) issued by the World Bank have proven to be more destructive than helpful. The study looks at cultural practices and traditions that may act to counter the intended effects of the conditionalities required by SAPs and examines what may make these plans inappropriate and potentially counterproductive to the Bank's goals of economic expansion and recovery. The question pursued revolves around the notion of growth and well-being's relationship to cultural and historical conditions. The case of Morocco, a developing nation that has received aid from the World Bank for over a decade, is examined as illustrative of a culture based on strong traditions and rich history that has begun to change to perform adjustments required for the support.

Shane Newborn – Biology/Pre-Med, Zachary Brain and Komal Patel – Biology/Pre-Dental, Courtney Harris – Biology/Pre-Optometry, and Kelly Harris – Biology/Conservation

*Uncovering the Mechanism of Plant Invasion by Employing a Comparative Biophysical Traits Study of Exotic (*Lonicera Japonica*) and Native (*Lonicera Sempervirens*) Honeysuckle Species*

Mentor / Sponsor: Kate He

Biological invasion, one of the major processes of global change is continuously rising in its intensity in the biota. With an estimated 137 billion dollar annual deficit in the U.S. alone, an urgent need to understand this change and the factors influencing its severity are essential. How can invasive species be so detrimental? What types of traits can enable species to function this way? In this study, we attempted to answer these questions by targeting morphological, physiological, and reproductive traits of exotic invasive (*Lonicera japonica*) and native (*Lonicera sempervirens*) honeysuckle species. By examining and comparing multiple traits of both species, we were able to test the hypothesis stated that invasive species outperform native species owing to their possession of suites of advantageous biophysical traits. Our preliminary results indicated that significant differences exist in leaf morphology, which is directly related to plant photosynthetic capacity, between exotic and native species. Specifically, larger leaf area and size are found in the native species, and a higher stomatal density and larger leaf vascular tissues are associated with the exotic species. Our results also revealed that exotic honeysuckle possesses a significantly higher seed production per fruit than the native species during its life cycle. We concluded that combination of advantageous traits enable the invader to perform successfully in the invaded ecosystems since its introduction. Further research will focus on the photosynthetic and leaf molecular characteristics between the two species. By understanding advantageous traits, further conservation methods can employ steps in saving native species from extinction.

Cassidy Norvell – Spanish and English Education

The House on Mango Street: Blurring the Border

Mentor / Sponsor: Mica Howe

First published in 1984, The House On Mango Street by Sandra Cisneros is now a part of the American literary tradition. The text paints a picture of young Esperanza's life in a presumably Mexican-American urban neighborhood through forty-four accessible vignettes that students at all levels - elementary school through college - are being asked to read and to analyze for the text's literary, cultural, and thematic value. This project investigates Mango Street's ability to connect with its multicultural and multigenerational audience by exploring the text's organic structure and sometimes ambiguous narration as techniques used by the author to soften the borders between the text and its readers.

Cassidy Norvell – Spanish and English Education

The Mania-Agape Love Dynamic as a Universal Issue in Take My Eyes

Mentor / Sponsor: Janice Morgan

The Spanish film Take My Eyes, released in 2003 as Te Doy Mis Ojos, tells the realistically complicated story of a married couple, Antonio and Pilar. This relationship, though marked heavily by mutual passion, consists of two individuals with varying love styles, which perpetuates abuse. According to the six love styles derived from combining and isolating the three dimensions of love, Pilar's love is agape, and Antonio's is mania. This particular combination of love styles is volatile, and the implications of it manifest themselves on the screen. While it is a wholly Spanish film in setting, characters, language, and production, the story and significance of Take My Eyes resonate outside of a culturally-specific context.

Suresh Nune – Chemistry

Polychlorinated Biphenyls (PCBs), Chlorinated Pesticides and Polbrominated Diphenyl Ethers (PBDEs) in Sediment, Mussel Tissue and Fish from Kentucky Lake

Mentor / Sponsor: Bommana Loganathan

Organohalogen compounds, such as polychlorinated biphenyls (PCBs), chlorinated pesticides and polybrominated diphenyl ethers (PBDEs) are known for their wide spread environmental contamination, bioaccumulation, biomagnification in the food chain and long-term health effects in wildlife and humans. However there exists no comprehensive study dealing with environmental contamination levels, bioaccumulation and biomagnification of these pollutants in fresh water ecosystems in particular, man made lakes such as Kentucky Lake. The understanding of organohalogen contamination levels in the Kentucky Lake environment and biota is important to prevent further contamination and to protect wildlife as well as delineating the possible exposure to other tropic level organisms including humans. The objective of the present study is to describe the levels of PCB congeners, chlorinated pesticides and PBDEs in western Kentucky using sediment, fresh water mussel and fish collected from Kentucky Lake. The samples were analyzed using standard methods. The results revealed that detectable concentrations of PCBs, chlorinated pesticides and PBDEs were found in all sediments, freshwater mussels and fish samples. The concentration pattern of organohalogen compounds exhibited following order: PCBs > PBDEs > Chlorinated Pesticides. The accumulation pattern of the organohalogens was found in the following order: Sediment < Mussel < Fish tissues. The levels of PCBs and chlorinated pesticides in fish from Kentucky Lake are below the Food and Drug Administration (FDA) established limits for human consumption.

Michael O'Brien – Biology

Blood and Intestinal Parasite of Tiger Salamanders (Ambystoma tigrinum nebulosum)
Based on Life Phase

Mentor / Sponsor: Howard Whiteman

Though there is abundant information about the life history of the tiger salamander, little information is available about their parasite communities, especially in congruence with their role in facultative paedomorphosis. It has already been shown that parasites mediate host behavior so it is not unreasonable to question if their parasite metapopulations are affecting the plasticity of the morphology types. Experimental evidence has shown that there are genetic, environmental, and fitness related components to determining whether facultative paedomorphosis occurs. The purpose of this study was to collect baseline data about the parasite communities of the tiger salamanders at the Mexican Cut Nature Preserve and Kettle ponds. We hypothesized that metamorphic adults should have higher prevalence of blood parasites (e.g., trypanosomes) due to increased exposure to vectors and that larvae and paedomorphs would have higher prevalence of intestinal parasites. We also predicted that cannibal larvae would have higher prevalence of intestinal parasites from gorging on typical larvae. Two sites, the Mexican Cut Nature Preserve and Kettle ponds in Gothic Mountain valley, located in South-Central Colorado, were used for collecting tiger salamanders in this study.

Jennifer Parrish-Lamb – Geoscience

A Comparison of Two Historic Church Sites in Land Between the Lakes (LBL) Through Multi-Date Composite Change Detection

Mentor / Sponsor: Haluk Cetin

The research project measured change in land cover and archaeological features at two LBL historic church sites using multi-date aerial photography. The data consisted of historic aerial photographs and recent digital orthophoto quadrangles (DOQs) of both sites. Preprocessing procedures involved scanning of historic photographs, geometric rectification of the photos, and radiometric and spatial enhancements of all photographs. Next, a supervised classification was executed in order to classify the data sets using a per-pixel approach. Landcover classes included bare soil, agriculture, forest, and archaeological features. Lastly, multi-date composite change detection method was performed in order to gauge alterations of the sites landscape cover and archaeological features due to the amendment of land use practices within the last 35-40 years. After analyzing the data, the sites were reviewed for a subjective archaeological evaluation. Some potential archaeological concerns were as follows: the presence of archaeological resources; the preservation/destruction of any archaeological resources due to change in land cover; and the promotion of preservation for any archaeological resources through proper land cover management. Once these concerns were considered, recommendations were proposed for future land management practices that promote the preservation of these historic church sites.

Tyler Parrott – Political Science

Unfit for Command: How Candidate Image Kept Kerry Out of the White House

Mentor / Sponsor: Mark Wattier

The 2004 Presidential Election was full of historic firsts. Despite a record number of voters casting a ballot, this campaign marked the first time in history that an out-party candidate received no bump in the polls following their national party nominating convention. Using a rolling cross-sectional analysis of data across the campaign, this paper demonstrates how the Kerry campaign failed to sell the American people on Kerry's competence to lead the nation in a time of war and how the stability of voters' assessments of this trait led to the failure of the 2004 Democratic National Convention and a failed bid for the presidency.

Maria Phillips – Chemistry, and Holly Mowery – Chemistry and Pre-Medical
Occurrence of Pharmaceutical Chemical Residues in Murray Waste Water Treatment Plant Samples

Mentor / Sponsor: Bommanna Loganathan

Pharmaceutical drugs including antibiotics are designed to be persistent and lipophilic so that they can retain their chemical structure long enough in the body to do their therapeutic work. Consequently, after they are excreted, such chemicals tend to persist in the environment and enter the food chain. There they bioaccumulate and biomagnify, causing harmful effects to wildlife and humans. In addition, exposure to environmental bacteria may lead to the development of antibiotic resistant bacteria. Understanding current levels of antibiotics and other drugs in environmental samples is important, in order to identify the chemicals of concern and its sources, to prevent further contamination of surface and groundwater, and to protect wildlife and humans from exposure and harmful effects. The objective of this study was to determine the concentrations of most common antibiotics, as well as a couple of illicit drugs, in the influent, effluent and other samples taken from various stages of treatment process at the Murray Water Treatment Plant (WWTP). Sampling was done during Fall, Winter, Spring and Summer seasons. Standard methods were used for sample treatment and analyzed for azithromycin, roxithromycin, clarithromycin, methamphetamine (N-methyl-1-phenyl-propan-2-amine), and MDMA (N, alpha-Dimethyl-1,3-benzodioxole-5-ethanamine) using HPLC-MS. Chemical analysis is in progress. Concentrations of the analytes in various wastewater samples from seasonal in concentrations of these compounds will be presented.

Tara Pool – Psychology
Rival Salience and Sport Team Identification
Mentor / Sponsor: Daniel Wann

This research explored out-group salience on in-group identification level. Approximately 400 Murray State University students were given a packet assessing demographic information and their identification with the University of Kentucky men's basketball team via the SSIS (Wann & Branscombe, 1993). 143 of the participants (52 males, 91 females) were then called and randomly assigned to either watch a neutral sports video or a Duke University (the chosen out-group) highlight video. Afterward, participants were assessed again on demographics and the SSIS, as well as on six other items included to mask the study. No significant gender differences were found, and a repeated measures ANOVA strongly supported the hypothesis ($t(142) = -3.77, p < .001$). The participants are currently being called back to reassess their level of in-group identification to determine whether or not the increase in identification has lasted and whether this was a state or trait change.

Bethany Powell – Outdoor Recreation

Eating Right and Being Healthy: A Service Learning Program

Mentor / Sponsor: Kelly Rogers

Eating Right and Being Healthy was coordinated along with the Senior Commodities Program to promote healthy living for senior citizens within a residential setting. The program's basic idea was aimed at informing senior citizens about the proper nutrition required or recommended for a healthy lifestyle. Information that was included in this program included nutritional facts, how to keep your food safe, and recipes for commodities. This program was sponsored by the Housing Authority in Hickman, KY. This program was conducted to meet the requirements for REC 520 Leisure and Aging, which is a service learning scholar's course.

Tara Radke – Elementary Education, and Jacob Hornbeak – Literature and Creative Writing

The Scientific Life of Water

Mentor / Sponsor: Howard Whiteman

Our project is an inquiry into the research and experiments of Dr. Masaru Emoto, a Japanese healer and New Age author who focuses on the effects of human thought on water crystals. Emoto's work involves exposing samples of water to positive or negative thoughts, words, or music, and then freezing these samples in order to photograph the crystals. Emoto claims that these photographs indicate that water crystals form more completely and perfectly when exposed to positive influences and extrapolates from this the principle that humans are capable, through thought, of affecting nature and themselves. The scientific validity of Emoto's work is, however, highly questionable. His work has been criticized within the scientific community, primarily for bias in his experimental method and his failure to share the details of his methods with the scientific community. Emoto has even admitted that he does not consider himself to be a scientist and that he instructs the photographers working in his labs to look for only the most pleasing crystal images. Ultimately, because of the biases found in Emoto's work, and his open admittance of selecting only those photos which correspond with his beliefs, his conclusions cannot be considered legitimate scientific evidence. While the results of Emoto's experiments do suggest an interesting possibility, that human thought impacts reality, this suggestion is ultimately a concern of philosophy, not science, and because his experiments are not carried out in a thoroughly scientific manner, they do not make this suggestion scientific.

James Ramsey – Biology

Lifecycle, Distribution, and Secondary Production of Hexagenia bilineata (Say) in Ledbetter Embayment of Kentucky Lake, Kentucky

Mentor / Sponsor: David White

The lifecycle, distribution and secondary production of *Hexagenia bilineata* (Say) were examined in Kentucky Lake to determine its role in the ecology of the reservoir and to make comparisons between Kentucky Lake and other systems. We sampled for 12 Months (Oct-2005 thru Oct-2006 excluding Feb-2006) using a geographically referenced, random design for Ledbetter embayment and a transect-station method to sample a densely populated region of the embayment. The majority of the population was semivoltine although a portion was univoltine. Greatest densities occurred in shallow water (<2 m) in sediments not considered to be prime habitat for *Hexagenia* spp. naiads. Annual production for the entire embayment was estimated as 184.83 mg m⁻² AFDM and 955.223 mg m⁻² AFDM for the densely populated transect. Mean densities were 13.4 m⁻² and 55.9 m⁻² for the embayment and dense transect, respectively. It appears that *Hexagenia* contributes less to benthic trophic flow in Kentucky Lake than in other reservoirs and lakes where it occurs possibly due to interspecific interference from large chironomids, food limitation, or year-to-year fluctuation in production resulting from cohort leakage.

Teresa Ray – Journalism

Paradise Friendly Home Revisited

Mentor(s) / Sponsor(s): Kate King and Chris Bierwirth

Paradise Friendly Home Revisited involves gathering the oral histories of middle aged alumni of an orphanage located in Graves County from approximately 1938-1978. The main focus of the interviews is the alumnus lives prior to, during, and after their lives at Paradise. With The support of the Kentucky Historical Society, URSA, and the McNair Scholars Program, ten interviews have been collected, with six scheduled during the summer of 2007. Finding the alumni is done using the snowball effect; it is an ethnographical qualitative study with analysis to begin during the summer of 2008, to be released for presentation in 2009.

Chase Redden – Accounting

Income Taxation of Estates and Trusts

Mentor / Sponsor: Floyd Carpenter

A major problem with the topic of income taxation of estates and trusts is that many individuals associated with estates or trusts account for them improperly on their tax returns. In general, taxable income of an estate or trust is computed in the same manner as in the case of an individual except as otherwise provided- tax is to be paid by the fiduciary. Deductions for distributions to beneficiaries are allowed. The fiduciary is liable for filing the return and paying the tax. The filing requirements (Form 1041) for estates are \$600 gross income or more or a nonresident alien beneficiary. The filing requirements (Form 1041) for trusts are \$600 gross income or more or any taxable income or nonresident alien beneficiary. One feature of estates and trusts is that there is no double taxation; the distributions are taxed to recipients and deductible by the estates or trusts. Fiduciary accounting income determines the amount distributed. Tax accounting income determines tax consequences or treatment of the amounts distributed. Overall, the rules are designed to minimize or eliminate the income tax benefits of having estates or trusts receive income.

Denisha Robinson – International Affairs

A Dark Side of Globalization: A Comparative Case Study of International Sex Trafficking

Sponsor / Mentor: Michael Basile

This paper will discuss how and why globalization has led to the creation of the Human Sex Trafficking industry in both poor and wealthy nations. The economic, political, and cultural profiles of two different nations will be the basis of understanding how such an industry came into existence and how it continues to thrive. This study will be comparing the United States and Cambodia and seeks to understand how two very different countries play similar roles in this industry. By understanding the conditions of these nations and investigating the industry itself, this study seeks to discuss how globalization has provided an opportunity for Human Sex Trafficking to take place on a broader spectrum.

Warren Robinson – Journalism and Spanish, and Alana Seaborg – English and Spanish

Expanding Borders: The Future of Space Exploration

Mentor / Sponsor: Howard Whiteman

International warfare, natural disasters, and overpopulation are all issues that are of great consequence to the human race. When these issues are considered together, it would seem that the Earth is becoming an increasingly unfriendly place for the whole human race. Perhaps a way to ease at least the problem of overpopulation is for the human race to begin exploring methods of improving space travel technology in order that one day we may colonize other worlds. This presentation will consider three culturally viable aspects of space exploration. First, what events are currently being reviewed in the media concerning this topic? Second, what steps will NASA be taking to ensure the continuance of space exploration following the near future retirement of its aging shuttle fleet in 2010? Finally, we will present our own predictions concerning this topic based on the information we have gathered. Since this field of science is likely to experience major advances as the human race advances, predictions concerning the future of space travel technology will be limited to near-Earth expansion.

Amanda Rosewell – Biomedical Sciences

Progesterone Anti-Sense Oligonucleotide Infusion in the Anteroventral Periventricular Nucleus Downregulates Progesterone Receptors

Mentor(s) / Sponsor(s): Timothy Johnston and Sandra Legan

An increase in circulating estradiol (E2) levels is an essential trigger for the preovulatory LH surge. During the estrous cycle, the ovarian follicles secrete E2 as they mature, and the rising E2 levels stimulate increased release of luteinizing hormone-releasing hormone (LHRH), which in turn stimulates an increase in pituitary luteinizing hormone (LH), which acts back on the follicle to cause ovulation. Chronic elevations in E2 lead to a down-regulation of estrogen receptors (ERs) in specific brain areas. Interestingly, blockade of PRs (progesterone receptors) block E2-induced LH surges. This finding demonstrates that PRs are essential for the induction of LH surges by E2. The LHRH neurons do not express PRs, however, a specific subgroup of neurons near the LHRH neurons, known as the anteroventral periventricular nucleus or AVPV expresses PR. If the AVPV neurons are destroyed by lesioning, LH surges are abolished, indicating that the AVPV neurons are essential for transmitting the positive feedback signal to the LHRH neurons. Therefore downregulation of PR in the AVPV by antisense oligonucleotides will diminish the E2- induced LH surge. Six sets of sections were used for fluorescence IHC; 3 sets to localize Fos in the AVPV (Fos is a control protein; it has been established that Fos is present in the AVPV neurons), and the adjacent three sets for localization of PR in the AVPV. Qualitative analysis is ongoing, however preliminary analysis has demonstrated that the PR anti-sense and Fos anti-sense downregulated the activity of the progesterone receptor in the AVPV neurons.

Kelly Rottman – Spanish

Lorca, a Spokesman for the Gypsies Through the Development of the Theory of Duende
Mentor(s) / Sponsor(s): Meg Brown and Mica Howe

To understand Federico Garcia Lorca is to understand a large part of Spain's culture and history. Lorca, one of Spain's most famous poets and dramatists, was influenced by his experiences living in Andalusia, Spain, where the gypsies and their lifestyle (including their beliefs in the supernatural) became an inspiration for his most famous collection of poetry, the *Romancero Gitano*. In Andalusia, amongst the gypsies, Lorca was able to develop the theory of duende, which he explained to be the ever-awareness of death that allows Spaniards to value true emotion over proper forms in arts. He was able to study the duende as he was introduced to the lifestyle of the gypsies, especially to their unique form of music and dance called flamenco. Through his poetry, he was then able to help give a voice to the gypsies. This aided them in their fight for equality in Spain, so that the gypsies would no longer be seen as a marginalized and oppressed group of the Spanish society. This study will look at several of Lorca's poems from the *Romancero Gitano*, as well as his essay on the theory of duende, to explain how Andalusia affected Lorca's work, and then to explain duende, and show how he was able to help give a voice to the gypsies through his works.

Rachel Scott – German Education

The Influence of Turn-of-the-Century Vienna on the Art of Gustav Klimt and Egon Schiele

Mentor / Sponsor: Meg Brown

Vienna at the turn of the twentieth century was full of interesting and innovative people with new and fresh ideas. These people strived to break free from old traditions and conservative lifestyles for new and more exciting ways of living. Two of these innovative people were the artists Gustav Klimt and Egon Schiele. With no fear, these artists strived to express themselves in their art. By doing so, Klimt and Schiele caused a great commotion in Vienna at the time. Their art excellently reflects some of the new ideas and changes that Vienna was going through around the year 1900.

Sarah Sharp – Archaeological Information Systems

Detection of Patterns of Past Occupation of an Archaeological Site Using Spatial Feature Manipulation Techniques

Mentor(s) / Sponsor(s): Haluk Cetin and Lara Homsey

Identifying past archaeological sites has come very important in preserving and explaining our past. The use of remotely sensed data has recently improved the method of finding these sites, and allowed archaeologists to uncover what in the past they would not have been able to see on foot. Satellite imagery of the Black Bottom Region of Illinois was obtained and remote sensing techniques were used on the imagery to try to identify areas of past human occupation. Spatial feature manipulation techniques, such as filtering were implemented to uncover these anomalies on an area with a known archaeological site. Then the same filters were used on an area in the region with a suspected site. The results were then analyzed to determine whether or not these filters could detect patterns in the landscape left by human occupation.

Cynthia Shaw – Chemistry

The Low-Barrier Double-Well Potential in Bound HIV Protease Systems and Small Analogs

Mentor / Sponsor: Pablo Molina

The presence of a low-barrier hydrogen bond (LBHB) in HIV Protease and other aspartyl proteases as well as its implications in drug design has been the subject of intense study. In this research project, we utilize a Numerov procedure to characterize the Od1-H-Od1 hydrogen bond (HB) in HIV protease systems where the enzyme is bound to highly symmetric inhibitors. We also investigate small compounds that present an LBHB and serve as analogs. Our methodology fully traces the shape of the HB's potential energy curve. The potential is used to obtain numerical solutions to the wave functions and vibrational energies of hydrogen, deuterium, and tritium. The vibrational eigenfunctions are used to compute expectation values for interatomic distances and vibrationally and thermally averaged spectroscopic properties of the O-H-O HB. Our predictions of isotope effects on the chemical shift of small analogs are consistent with experimental measurements. The results support the predictive power of this method and its potential use in screening inhibitors of aspartyl proteases.

Melanie Shepard – German

Is AIDS Prevention in Africa Successful?

Mentor / Sponsor: Michael Basile

This study examines the different educational approaches taken by South Africa, Botswana, and Uganda in their endeavor to prevent sexually transmitted infections. The focus of this study will cover the effectiveness of those educational approaches in relation to the socioeconomic statuses of each country. The purpose of this study is to discover why the country of Uganda is reducing sexually transmitted infection rates while South Africa and Botswana are increasing, and why it relates to the effectiveness of their educational programs.

Whitney Shirley – Agribusiness, Brittany Collins – Agricultural Science, and David Crouch – Agronomy

Comparison of Residual Herbicide Programs for Dark-Fired Tobacco

Mentor / Sponsor: Pat Williams

Using a randomized complete block design with four replications, the dark tobacco was set in four rows that were 40ft long. The eight experimental treatments were applied at a rate of 15 gal/acre with one control plot. All treatments were pre-plant incorporated. Comparisons will be made between the eight experimental treatments for the current season's data and the previous year's data.

Kyle Smith – Journalism, and Lacey Sparks - History

The Impact of Culture on Scientific Discovery

Mentor / Sponsor: Howard Whiteman

Over the course of our everyday lives, we encounter constant instances where science and technology interact with our culture. As a society, we hardly ever take the time to examine how our own cultural and religious influences affect the way that we perceive science and technology. For our presentation, we plan to examine the perception of science and technology through history with an emphasis on how cultural and religious influences affect how results are received by the general population as well as by fellow scientists. Through this examination, we plan to demonstrate how such influences can skew research. Our two main areas of focus are the use of gunpowder and the conflict between the Catholic Church and scientists over the heliocentric theory. We will follow the use of gunpowder through both the early Eastern uses as well as the later, bloodier Western uses. Through this examination we hope to show how the culture of the users of gunpowder affects how this advancement in technology is used. In our examination of the conflict with the Catholic Church we will first present an overview of the heliocentric theory, and then we will examine Copernicus and Galileo's roles in the conflict. We will also bring up a few surprisingly recent developments concerning the heliocentric theory. While the direct cultural aspects of this example are less prominent, the religious debate has a direct impact on the culture. All of these topics are interconnected, and we will illustrate these connections in our presentation.

Courtney Snapp – Water Science

Diatom Colonization Patterns in Springs at Land Between the Lakes National Recreation Area, Western Kentucky and Tennessee

Mentor / Sponsor: Susan Hendricks

Diatoms (*Bacillariophyta*) are algae sensitive to chemical conditions in water. Therefore, they are a useful supplement to chemical analyses in assessments of water quality. Parent geology determines spring water chemical factors that may influence species composition of periphyton colonizing stream substrates. In October 2006, a study of diatom colonization patterns was carried out in four springs emerging from different geological materials in Land-Between-the Lakes National Recreation Area located in western Kentucky and Tennessee. Two springs emerge from limestone geology and two springs emerge from siliceous/argillaceous geology. Unglazed quarry tiles were deployed in each stream a few meters downstream from each spring and were allowed to colonize for four weeks. The tiles were retrieved, diatoms were identified to genus, and biomass was determined from chlorophyll a analysis. Physiochemical characteristics and nutrient concentrations also were measured in each spring. Conductivity was the only chemical characteristic that was significantly different among all four springs. *Achnanthes*, *Cocconeis* and *Gomphonema* were dominant in the carbonate streams with limestone geology. *Diatoma*, *Eunotia*, and *Pinnularia* were more abundant in the streams with siliceous and argillaceous geology. This study will be expanded over the next 8 months to test the hypothesis that springs with contrasting geologies (and therefore different water chemistries) will develop different diatom community compositions. Developmental sequence analysis of stream periphyton also will be used to test the hypothesis that different spring water origins as defined by stable isotope (^{13}C) signatures will be reflected in the biomass of periphyton colonizing the substrata over time.

David Sohn – Geosciences

Detecting Temporal Changes in Mountain Glaciers Using Remote Sensing and GIS

Mentor / Sponsor: Haluk Cetin

Due to the warming of the global climate, many high mountain glaciers around the world have been decreasing in area and mass. Snow and ice accumulation during the winter months generally does not equal or exceed the snow and ice ablation, or melting, that occurs during warm weather months. Due to the remoteness and inaccessibility of many high mountain glaciers, remote sensing, using satellite imagery and aerial photography to analyze the Earth's surface, and Geographic Information Systems (GIS) are ideal tools for the analysis and mapping of temporal changes occurring in high mountain glaciers. The purpose of this project was to map changes in the Dinwoody glacier, located near Gannett Peak in the Wind River Range of western Wyoming, over a 12 year period. A post-classification comparison image processing technique was utilized to map changes in the glacier's size using two Landsat satellite images from 1988 and 2000. Because Dinwoody glacier is on a fairly level surface, it was expected that Dinwoody glacier has remained in the same location, but has shrunk in area. It was also expected that the process of calculating glacier size, location, and amount of ablation using Landsat images and GIS could be applied to mountain glaciers worldwide.

David Solomon - Psychology

Divided Attention Increases Negativity Bias

Mentor / Sponsor: Paula Waddill

This study investigated the effects of divided attention on the negativity bias. College students served as the sample for the study (N = 51; 18 males, 33 females). A prerecorded script of 42 traits and behaviors was used for the study. The script presented a description of an employee and included an evenly distributed number of positive, negative and neutral traits and behaviors. Subjects in the divided attention condition listened to the script while also completing a visual, math distraction task. Subjects in the full attention condition listened to the script with no competing task. Then all the subjects were asked to recall any information that was said about the fictional character, and rate the character on a number of related scales. It was hypothesized that the divided attention task would reduce the numbers of listed traits and behaviors that were recalled and that the proportion of negative behaviors and negative traits that were recalled would be higher for the divided attention condition than the full attention condition. It was also predicted that the divided attention condition would produce more negative ratings of the employee. All three hypotheses were supported. These results show that distraction increases the negativity bias.

Tammy South – Independent Studies

An Archaeological and Historical Study of the Paris Landing State Park Bradford Cemetery

Mentor / Sponsor: Kit Wesler

Bradford Cemetery, which is situated on the grounds of Paris Landing State Park, became the focus of discussion by park rangers during the summer of 2006. A proposed trail extension which would lead to the cemetery from an existing remote hiking trail was scheduled for construction. Upon inspection of the study location, it was determined that this trail extension would cut across what appeared to be several graves, many of which were unmarked. The goals of this research project and paper were to adequately layout the parameters of the original cemetery as well as determine the context and integrity of the unmarked graves.

Autumn Starks – Spanish

The Message of "Estacion Inmovil"

Mentor / Sponsor: Mica Howe

Pablo Neruda was a wonderfully popular poet who lived and worked in Chile for most of his life. His poems were directed towards the common person and were enjoyed by this group for many years. Most of Neruda's poems fell into two categories; poems that were politically themed or poems that celebrated life and nature. "*Estacion Inmovil*" is a beautiful poem which is of particular interest because it has both political undertones and a veneration of natural elements. This paper will explore both these themes as it investigates the subliminal message behind "*Estacion Inmovil*" and what this message means for the readers of Neruda's extensive works.

Melinda Streetman – Outdoor Recreation

Share a Seed, Watch it Grow: An Intergenerational Program

Mentor / Sponsor: Kelly Rogers

Students enrolled in REC 520 Leisure and Aging were required to conduct a service learning project with area senior citizens. The project chosen for this assignment was Share a Seed Watch it Grow. This program, which is sponsored by Murray State University Recreation and Leisure Services, Murray Independent Schools, and Murray Calloway County Parks and Recreation, is in its second year. Share a Seed Watch it Grow is an intergenerational program that brings area kindergarteners and senior citizens together in a common goal of bettering their community. Kindergarteners learn about plant life including planting, watering, and watching the plants grow. Seniors benefit by forming positive relationships with the youth of the area. The end result is that the community gets more plant life and the area youth and senior citizens learn from each other.

Heather Stroupe – Psychology

Job Expectations Among College Students

Mentor / Sponsor: Paula Waddill

For many employers, employee job satisfaction can mean the difference between a successful business and disastrous turnover. Job satisfaction can be affected not only by the current job environment but also by the degree to which the job matches the initial expectations that the employee brings to that job. Previous research has focused on how unmet expectations result in low job satisfaction among current employees and how job satisfaction can be improved through efforts on the job site by employers. In comparison, this study was designed to investigate the expectations college students have about jobs before they enter the job market. Expectations about salary, growth, and the amount of time spent job hunting were compared as a function of class and type of job (related to major, not related to major). Implications for college career education are discussed.

Nicole Suhrenbrock – Accounting

Fair Value Measurement

Mentor(s) / Sponsor(s): Tim Miller and Don Chamberlain

Fair Value Measurement has been a controversial issue in accounting because in the past, the methods for measuring the fair value of assets and liabilities were diverse and inconsistent. Statement of Financial Accounting Standards (FAS) 157 on Fair Value Measurements was issued in September 2006 to provide enhanced guidance for using fair value to measure assets and liabilities. Since over forty current accounting standards within Generally Accepted Accounting Principles require entities to measure using fair value, it is clear that this new standard will have a significant impact. Research on FAS 157 is necessary to determine the impact on existing practices and how entities will be able to make the transition, how the standard will need to be disclosed, and the effect the Fair Value Option will have on companies.

Nicole Suhrenbrock – Accounting

Passive Activity Loss Rules

Mentor(s) / Sponsor(s): Floyd Carpenter and Don Chamberlain

Passive Activity Loss Rules are a complex area in federal income tax law and can be difficult to understand and apply. An objective of this research is to increase knowledge of Passive Activity Loss Rules while demonstrating their importance to taxpayers. Although the rules are complicated, they are a necessary component of the tax law. A background and history of Passive Activity Loss Rules and why the rules were created is the starting point of the paper. Discovering specific problems of passive loss rules and explaining the particular areas of taxpayer confusion is another important focus. Illustrative, numerical examples of the rules and limitations are included. There is also a key focus on tax-planning considerations to benefit taxpayers with a financial interest in a passive activity.

Kaleb Tapp and Brian Craig – Agricultural Systems Technology, and Magen Roberts – Agribusiness

Comparing Nitrogen Rates in Dark Tobacco

Mentor / Sponsor: Iin Handayani

After the tobacco was set, 125 units of the following types of nitrogen were side dressed on the tobacco. Hydro Plex, K Nitrate, Ca Nitrate, Triple 15, 21-7-14, and Am Nitrate were all applied to the crop in different test areas. Once the fertilizer had been applied the tobacco grew, was harvested, and is now in the process of being dried and soon stripped. When the tobacco was stripped and then weighed the final data collections will be made. This data will show each individual applications effect on the plants. Some applications of the nitrogen may have a negative affect on the tobacco, while other applications will increase the yield of the crop. The information collected can be very helpful to tobacco farmers who look at test plots when determining how to grow their crop for next year and also learning how to maximize their profits.

Mitchell Thomas – Finance

The Effects of Globalization on the United States Giants: A Case Study of the General Motors Corporation

Mentor / Sponsor: Michael Basile

Since the collapse of Delphi, things have only been downhill for the automotive giant. It is also predicted within the next two years that they lose their place on top of domestic sales. In order to prevent this from happening, General Motors must take a action now. They can outsource, mechanize their lines, or even buy out their suppliers. Mechanizing manufacturing plants decreases labor costs which is a huge problem for American factories because of our high labor costs compared to the rest of the world, but it also increases maintenance costs and requires a huge initial investment. Purchasing the suppliers for their automobiles is also a viable option because it will decrease annual costs, but also requires an enormous initial investment and spreads the company out thin causing stress on management. Outsourcing will allow General Motors to decrease labor costs by taking advantage of cheap labor costs abroad at the cost of losing some American jobs. The majority of these jobs lost will be relatively low paying and with time those losing their jobs should be better off. Outsourcing manufacturing jobs allows the United States firms to help developing countries progress and at the same time cut the cost of labor 10 percent. With all the options laid out, outsourcing is the most viable option and will be the best chance for General Motors to improve their competitive stance within the automotive industry and allow them to gain part of their market share they have lost.

Courtney Thomason – Wildlife/Zoological Conservation, Tiffany Hedrick – Biology/English

Stressors Associated with Anthropogenic Disturbance Affect Humoral and Cell-mediated Immunity in White-footed Mice (Peromyscus leucopus)

Mentor / Sponsor: Terry Derting

Increased anthropogenic disturbance of natural habitats can create greater physical, nutritional, and social stress than wild animals would normally experience. Previous research showed that white-footed mice (*Peromyscus leucopus*) from disturbed habitat patches exhibited decreased humoral and increased cell-mediated immune responses compared with mice from undisturbed patches. In order to examine the factors that may account for these differences in health, we studied individual and combined effects of social and nutritional stress on immunocompetence in *P. leucopus*. We hypothesized that social stress (i.e., high population density) takes a larger toll on the immune system than nutritional stress (i.e., low dietary protein). White-footed mice housed in pairs mounted a significantly weaker humoral immune response than those housed individually. Mice fed a low protein diet mounted a significantly weaker cell-mediated immune response than mice fed a high protein diet. Given that increased social stress and decreased nutritional stress are associated with anthropogenic disturbance, these factors may explain the differences in immunocompetence seen in previous research. Understanding immune function in wild animal populations is important because virtually all emerging infectious diseases that appeared within the past decade have been associated with some form of human activity. The decrease in humoral immune function associated with increased population density in disturbed habitats may lead to increased contraction and spread of infectious diseases to adjacent human and animal populations.

Mikala Trapani – Economics

Review of Literature on Charitable Giving: The Difference Between Donating and Purchasing

Mentor / Sponsor: David Eaton

Hunger, disease, and poverty continue to affect a large portion of the world's population charitable giving is a way that those who have the means can help the less fortunate. There are many ways to give to charity by donating time and money to legitimate causes. Also it is becoming more common for large charities to raise funds through products that people use and purchase every day. Such as Yoplait caps for the cure and the Global Funds Product Red products like clothing from the Gap. These products are distinct because when they are purchased a portion of the money goes directly to a charitable cause. This paper will provide background on the differences between the methods used by charities for raising funds and the effectiveness of those methods.

Christopher Totty – Computer Science

Malware Detection Software for Microsoft Windows - Home Again

Mentor(s) / Sponsor(s): William Lyle and Bob Pilgrim

When we sneeze, we cover our mouth for the comfort of others, but what can a computer do? The purpose of this project, in few words, is to help cover the mouth of infected computers. Firewall software currently available is rather successful at protecting one's computer from the outside world. This is restricting, however. The proposed project will work differently than current firewalls. Conventional firewalls use a white-list type of program blocking. The proposed program will instead use a black-list type of program blocking. This will allow all programs to work correctly until the user decides to block the program from communicating over the network connection. This program will moderate the interaction between the computer and its user. More specifically, the program will make the user aware of actions the computer takes which the user may not know. This will, in effect, help to capture and control the threat of zombie computers and therefore unauthorized distributed networking including denial of service attacks and propagation of spam. The development of the main program will rely on the Visual Studio 2005 environment using a majority of C# code. The majority of the program facilities are incorporated in the capturing and sorting of information traveling over the network interfaces. The networking aspects of this project beyond the actual capture include communication with a central server. This central server will use SQL server 2005 in order to maintain a database of users' computer actions. This information is accessed via a web browser through a password-protected interface developed under Visual Web Developer using ASP.NET 2.0.

Stephanie Totty – Computer Information Systems

The Capability Maturity Model

Mentor / Sponsor: Victor Raj

The Capability Maturity Model, created by Carnegie Mellon, was constructed to solve problems in software engineering and development. The model describes levels of effectiveness at which a business operates: the higher the level, the more effective the business. The current version of the Capability Maturity Model is called Capability Maturity Model Integration. CMMI is the composition of several Capability Maturity Models that derived from the original. The CMMI is a framework for business process improvement. CMMI is more flexible than the original model because it has to different paths a business can take. One path involves maturity levels. The option is less flexible than the other path, but if a business uses maturity levels, it will be easy for others to know exactly how efficient the business is because a business cannot rise to the next maturity level unless it has shown it has mastered all the parts of its current level. Capability levels, on the other hand, allow businesses to mold the model to better fit the business s current situation such that the business can focus on the issues they feel are most important to the business at present. One of the reasons it is important to implement the Capability Maturity Model in a business is because government agencies require CMMI for businesses bidding for government projects.

Melissa Underwood and Jennifer Jatzak – Elementary Education

The Natural History of Land Between the Lakes

Mentor / Sponsor: Howard Whiteman

Land Between the Lakes was once called Between the Rivers. Between the Rivers was an area of land comprised of 170,000 acres located in parts of Lyon and Trigg Counties of Western Kentucky and Stewart County, Tennessee between the Cumberland and Tennessee Rivers. The area, now known as Land Between the Lakes (LBL), was once home to more than 800 families which were forcibly removed by the power of eminent domain. Our work involves researching the natural history of Land Between the Lakes and the local plant and wildlife. The objective of this research was to examine how the natural history of Land Between the Lakes has affected local plant and wildlife. This work increases our understanding of why it is important to learn about the natural history of Land Between the Lakes and the local plant and wildlife.

Chelsea Vandiver – Spanish

The Themes of La Dama del Alba

Mentor / Sponsor: Leon Bodevin

The literature of a certain culture often reflects the thinking of the culture during that particular time period. Three recurring themes in "La Dama del Alba," by Alejandro Casona, reveal not only beliefs of the culture of Spain during the early twentieth century, but they also offer insight into human nature. These themes include love, life, and death, which have shaped the characters of the play and their actions. Casona's literary techniques show how he was able to successfully create this story of intertwining themes, and how his techniques and the material of the play reflect the Spanish culture during his lifetime. This presentation will explore Casona's use of the three themes and will also illustrate how they relate to the characters of the story and to the Spanish culture.

Georgena Ware – Theatre

He Said – She Said: A Look into the Arguments Concerning Turkey's Entrance into the European Union

Mentor / Sponsor: Michael Basile

A study conducted on the concerns for Turkey's membership into the European Union. Research will be concentrated on the cultural implications of their membership and the reservations from both Turkey as well as members of the EU. These arguments will be explored through the historical and cultural origins and how they are directly related to the negativity towards their membership. Through these arguments, I will also explore what will happen to regionalization if they are or are not granted membership and how this will shape international affairs with Turkey.

Kristen Watson – Elementary Education, and Lyndi Keel – Organizational Communication

Alleviating Emergencies in Africa through Science and Technology

Mentor / Sponsor: Howard Whiteman

Africa is a continent marked by intense economic, social, and political struggles. Disease, extreme poverty, hunger, civil conflicts, and lack of education create a dominant cycle of crisis that has crippled Africa's developing countries and made internal correction impossible. In order for Africa to rise above these intense challenges, it is important that its citizens are aware of the emergence of cutting-edge ideas in the field of science and technology that could be beneficial or potentially hazardous to this suffering continent. The short-term and long-term benefits and costs of technological tools and advancements will change the face of emergencies in Africa. Science and technology have altered the history of Africa, and now they will serve in the central role of alleviating the current crisis of the continent. First, advancing technology in areas such as medicine, food production, child care, and many others will play a vital role in eradicating struggles faced from extreme poverty and hunger, as well as disease. Second, providing the proper training and knowledge to the people of Africa about science and technology is essential to enabling their independence on external assistance. Education in the benefits and uses of technology will allow the people of Africa to gain effectively from the products of science. History has shown that simply giving these developing countries new technology can be detrimental because it breeds dependence and is not effective in the long-term. Assistance to Africa's developing countries should focus on sharing useful technology and educating the African people about how and why they should use science to build safe and productive communities.

Andrew West – Wildlife Biology

Susceptibility of Arboreal Termites, Nasititermes acajutlae, with Relationship of Environment

Mentor / Sponsor: Claire Fuller

Human activities have changed the environment around us so fast that nature has not been able to keep up. This causes stress on the organisms in the environment. Studies have shown that the environment affects the immune system as well as the impact of pathogens and parasites on their hosts. My mentor has been working with the arboreal termite, *Nasititermes acajutlae*, on the island of St. John, US Virgin Islands since 1996. *Nasititermes acajutlae* on St. John occur in many different habitats, ranging from the cool/moist rainforests in the mountains to the hot/dry beaches. Previous studies show two indicators of immunity, phenoloxidase activity (PO) and hemolymph protein concentrations. These tests have given two different results. The PO was highest in hot/dry climates, whereas blood proteins were highest in cool/moist climates. An increase in each of these parameters should be associated with an increase in disease resistance. Therefore, we are not sure whether one of these immune factors is most important in warding off disease, or whether each factor might be most important for a different class of disease (e.g., bacterial or fungal). I hypothesize that termites will show different susceptibility to fungus based on their environment. I will test this by exposing termites from the extreme environments (hot/dry and cool/moist) to pathogens. I will place termites from one environment into the other environment to see if the immunity will change. This will allow us to infer whether PO or blood proteins are most important in warding off disease. Because fungal diseases are important pathogens in termites, we will use a pathogenic fungus, *Metarhizium anisopliae*, to test the termites' susceptibility.

Eric Wilson

Monitoring Water Levels in Personal Hydration Systems

Mentor / Sponsor: Marlin Greer

The growing popularity of personal hydration systems (PHS) such as the Camel Bak has solved the problem of making water more easily accessible to athletes and armed service troops during mobility, however PHS have left in their paths a major problem. PHS users often run out of water without knowing because the water level is not visible and the backpack that the water bladder is inside of makes it very difficult to sense the weight of the remaining water. My thesis seeks to present various solutions to this problem using electrical sensors and visual alerts. My report will present several design possibilities and document in detail my building of the most feasible design. In the future, such a device could be linked to heart rate monitors and cyclo-computers as another internal mode providing feedback on the body's water intake. This device would not only have huge implications in the advancement of athletic training it could help users ration their water supply and literally save lives.



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