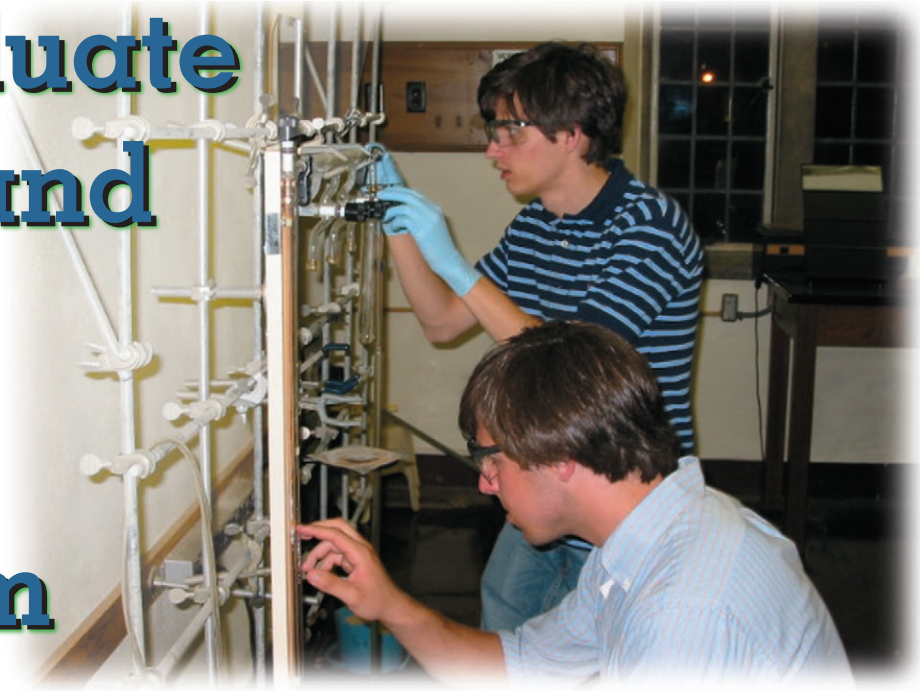
Undergraduate Research and Creative Activity Symposium



Rhodes College
—1848—

APRIL 28, 2006
MEMPHIS, TENNESSEE

The URCAS 2006 cover: clockwise from upper left: Scott Barb and Jeremy Holzmacher perform a Physical Chemistry experiment; Charles White, Matthew Horton and Josh Jefferies, blowing some jazz; Stephanie Swindle and her big bass; students from our SWEEP partner, Cypress Middle School (see page 58).

Table of Contents

Symposium Planning Committee 2006

Courtenay Harter (Fine Arts)
Ryan Byrne (Humanities)
Chris Mouron (Natural Sciences)
Janet Panter (Social Sciences)
Richard Redfearn (Chair, Natural Sciences)
Sonia Nkashama (Student Representative)

Abbreviated Schedule

The Gladys Cauthen Orchestra Soloist Competition: Thursday, April 27

Tuthill Performance Hall in Hassell Hall, 3:30 p.m.

Plenary Lecture: Thursday, April 27

Ms. Kandace K. Holladay, Instructor of Spanish, University of Central Florida
B.A. Spanish, Rhodes College, 1996; M.A. Spanish, University of Central Florida, 2000; A.B.D. Spanish, University of Florida, 2005

Lecture: McCallum Ballroom 6:00-7:00 pm
Reception: Crain Lobby 7:15 pm

"The historical-political vision of Mexico in the drama of Marcela del Río, Elena Garro, Rosario Castellanos and Luisa Josefina Hernández"

Four Mexican women playwrights use the theatrical genre to critique official versions of historical events in Mexico as well as contemporary Mexican politics. The representation of the authors' historical and political vision expresses among other things a Bakhtinian dialogical discourse that sets against each other two consciences: the conscience of a contemporary Mexico that has mythologized its past and the conscience of a past that often undermines contemporary myth.

Friday, April 28: during our Symposium – a community lunch

Enjoy a "Ratnic" lunch with our community of scholars, on the main quad.
(Rain location: Burrow Refectory)

Student Presentation Sessions

Sessions starting at 10:30, continuing until 4:20, various locations on campus. See the Table of Contents, or look up a speaker in the Index.

Closing Reception and Announcement of Outstanding Presentation Awards:

4:30-5:15 pm, Frazier Jelke Amphitheatre
(Rain location: The Middle Ground)

CODA pARTy on the Green

12:00 noon to 10:30 pm Friday, The Green (the field east of Barret Library)
7:30 pm – 11:00 pm Saturday, The Green and Fischer Gardens

Fine Arts Oral Presentations – Session 1
417 Clough, beginning at 10:30 a.m. until 12:00 noon

Session Chair: David McCarthy, Department of Art

10:30-10:50 **From *Le Charivari* to His Private Paintings: Portrayals of Class Division in Daumier's Art of Public Transportation**

Elizabeth W. Jones
Faculty Mentor: David McCarthy
Department of Art

Honoré Daumier commented extensively on the political turmoil of nineteenth century France through the publication of his satirical cartoons. A prevalent theme throughout both his lithographs and paintings is that of public transportation, an aspect of society that blossomed in the nineteenth century and was subject to much critical debate. By focusing on this continuous theme of Daumier's art, this paper attempts to uncover his own inclusion in Parisian society by discussing his political lithographs as distinctly public works in relation to his paintings which reveal his personal consciousness of the modernization of Paris through the eyes of both the working and middle classes.

10:50-11:10 **Role Reversals: Active and Passive Viewing in Manet's *Olympia* and *Christ Mocked***

Mallory Thornberry
Faculty Mentor: David McCarthy
Department of Art

Among art historians, there is an almost unanimous agreement that Manet's works, specifically *Olympia*, and his flattening of space signify the beginning of modernism in painting. This paper discusses Manet's deliberate compositional choices in *Olympia* and its pendant, *Christ Mocked*, focusing on spatial organization and the gendered nature of viewing, concluding that *Olympia*, both the painting and figure, have been re-gendered, and therefore alter the traditional painting/viewer relationship. The reversal of roles in that relationship, and the spatial organization associated with this reversal, may account for *Olympia's* being thought of as first modern painting, and for flatness becoming the most characteristic formal aspect of modern art.

11:10-11:30 **The "Singing Ladies" and Their Impact on Professional Female Performance in Seventeenth-Century Italy**

Addie Peyronnin
Faculty Mentor: Mona Kreitner
Department of Music

The advent of singing and performance as an acceptable professional endeavor for women in the Italian state of Ferrara marked a considerable change in the until-then primarily male makeup of courtly entertainment. Female performance had been limited to nobly-born women who cultivated their musical talents as a part of the standard education of a future courtier and lady-in-waiting. In the 1580s, however, Duke Alfonso II recruited to his court four women–of little or no social rank–with extraordinary voices.

Their arrival at Ferrara signified the beginning of a new type of ensemble, the *concerto delle donne*. The *concerto* is typically described by sources as a group of three "singing ladies" who performed mostly alone with limited accompaniment. The group became an instant sensation in Italy and in most of Western Europe and inspired similar groups at other Italian courts. One of the most important developments brought about by the success of these ensembles was the music composed specifically for the female voice. Additionally, well-regarded female composers began to publish their own music. The impact that these women had on their society and successive generations made it possible for others to earn respectable jobs as paid professional musicians and performers.

11:30-11:50 **Native American Influence in the Works of Jackson Pollock**

Stephanie Swindle
Faculty Mentor: David McCarthy
Department of Art

Jackson Pollock's paintings and drawings from his early years in New York, prior to his allover style of the late forties, are categorized as his myth-making stage within Abstract Expressionism. However, these myths are not as much made as they are appropriated and transformed from Jungian psychoanalysis and Native American cultures, which were both extremely popular with New York artists, collectors, and writers at the time. On account of Pollock's childhood in the West, he identified with Native Americans and their artforms and claimed a certain kinship that other artists in New York could not. Although he sought psychoanalytic treatment in 1939, submitted works of art for his therapist to analyze, and respected Surrealist and Cubist techniques, his identity as a man from the West is essential to understanding Pollock as an American artist, as opposed to a follower of European art. One of the significant examples from this period, *Male and Female* (1942), uses totemic imagery and allows the viewer to assess Pollock's continental allegiance to Native American art and culture within American modernism.

Fine Arts Oral Presentations – Session 2

100 Hassell Hall, beginning at 1:00 pm until 3:40 pm

Session Chair: Brandon Goff, Department of Music

1:00-1:20 **More Than Art**

Joel Parsons
Faculty Mentor: Hamlett Dobbins
Department of Art

In the Spring of 2005, after weeks of brainstorming and planning, I was involved in the launch of a new artists' collaborative. This collaborative, called More Than Art, focused on incorporating underserved and unincorporated populations residing in the neighborhoods around Rhodes into a community of artists. The first group included 7 members, four of whom were homeless, two who were students, and one, a pastor's wife. The group grew and evolved and began to produce work prolifically, including sculpture, a series of collaborative paintings and drawings, a compilation CD, and a miniature magazine. In August of last year, the members of More Than Art were featured in a show hosted by Rhodes featuring their collaborative and individual work from the previous months. This presentation will explore the evolution of the group from its founding to the present day, its challenges and successes, and the impact that participating in such a group has had on my own studio practice and my understanding of the necessity and accessibility of art in Memphis.

1:20-1:40 **Tonality in a New Musical Language**

James A. Cornfoot
Faculty Mentor: Brandon Goff
Departments of Music

In common practice music, music revolves around a tonal center; a famous example is Beethoven's *Symphony No. 5 in C minor, Op. 67*, in which the tonic is C minor and progresses to keys that are closely or distantly related to the original key. In pop music and compositions from today's composers and song-writers, this practice is still in effect, but the theory of music has changed in such a way that a tonal center is no longer essential or even present in music. The composers of the Second Viennese School – Schönberg, Berg, and Webern – abolished any sense of tonality with the technique of serialism; composers of the minimalist movement such as Philip Glass, Steve Reich, and John Adams are based upon a system of tonality that is not functional. The work I composed, entitled "Rhapsody," features a tonal center of B-flat, but there is only a small hint of the functional harmony of common practice theory. Using minimalist techniques, this work develops its one theme through orchestrated and melodic variations, but the tonal center of B-flat permeates the entire six-minute piece.

1:40-2:00 **Against the Grain: A Labor of Defiance and Love**

Laura C. Schilling
Faculty Mentor: Erin Harmon
Department of Art

Defining myself as an artist was something that challenged and changed my perception of who I am as a person. I had always identified myself as having the ability to "do" anything. It seemed that everything came effortlessly. But I wasn't satisfied with any of the awards I earned or accomplishments I achieved because I knew I didn't have to try to win or excel. All throughout my childhood I had been drawn to painting, photography, and sculpture; but my impulses had been severely discouraged in favor of more practical interests. Given this history, it was either a significant or crazy decision for me to pick up an art major in addition to my business major and English minor. Since that point I have explored many mediums. I have worked with painting, photography, sculpture, and installation, using the creative ideas I developed in my body of poetry to inform the art I made over my years at Rhodes. This body of artistic work represents the only thing I have ever done solely for myself, of my own accord. I was my motivation, my validation, my own worst critic. Pursuing this goal on my own has made me aware of my capabilities not only as an artist, but as a person. The time I have spent in the studio and in critique has been a time of personal development, a private experience that has lead to the public display of my most personal and important ideas and values.

2:00-2:20 **Charles Darwin, Musical Organicism, and Modern Composition**

Andrew Drannon
Faculty Mentor: Brandon Goff
Department of Music

When Charles Darwin formulated his theory of natural selection, he inferred that complex organisms must have descended from an original simple life form. This idea indirectly provides a key to understanding the creation of musical works – composers had been using the same line of reasoning since the inception of music to generate extended works based on short, recognizable fragments of melodic material. This connection between music and biology can be found throughout several historical periods, in the work of such representative composers as Franz Joseph Haydn, Ludwig van Beethoven, and Arnold Schoenberg. The connection continues into the latter half of the twentieth century, where this idea has been varied and deconstructed by composers such as Philip Glass, Steve Reich, Charles Wuorinen, and Michael Torke. The presentation will feature an application of this historical trend – the creation of a new work from the ideas and techniques that stem from Darwin's original indirect codification of the doctrine of organicism.

2:20-2:40 ***Break***

2:40-3:00 **Process and Influences: From Past to Present Works**

Jeanne Tyson
Faculty Mentor: Erin Harmon
Department of Art

My work has progressed from documentary in style with a focus on people and their stories to abstract videos that read like paintings. These different focuses have lead to my current work, which deals with my personal connection to the camera and screen. As the subject of my video, I am able to have more control of both the end product and of the interpretation that is left up to my viewers. One of the many artists that has had a constant impact on my work has been Andy Warhol. Contemporary filmmakers that have influenced these pieces include people such as Miranda July and Gus Van Sant. This lecture will include an explanation of my process, and a discussion of what effects these influences, and others, have had on my work. I will also discuss what it takes to show good and bad work to my peers and professors for the sake of development and process.

3:00-3:20 **Sharp Emotions**
Rene Orth
Faculty Mentor: Brandon Goff
Department of Music

We all have similar stories in which we find ourselves unable to express our emotions in words, but in the middle of listening to a piece of music, we find what we hear to be the epitome of what we feel. My most recently completed composition, *Sharp* for cello and piano, was written completely out of this inexpressible emotion; it is, in a sense, my own musical journal of frustration and anger felt between the months of October 2005 and January 2006. My presentation highlights the process and the means of translating my feelings into music, as well as a MIDI realization of the piece.

3:20-3:40 **Even Better Homes and Gardens**
Sarah Stevens
Faculty Mentor: Erin Harmon
Department of Art

I am the maker of wonderland. I like stuff. I like to get it, but mostly I like to make it. What I make is comprised of what I acquire- it's all part of one continual evolutionary artistic process predicated simply on observation and proliferation. Everyday materials pulled from the domestic sphere- mattress egg crate foam, felt, yarn, duct tape- morph into three dimensional figures realized through processes of material synthesis and repetition. The goal is creating a pert visual dialogue through the investigation of line, form, color and texture and spatial relationships informed by the coalescence of a number of thoughts and observations. Sixties music ephemera, Jujubees, domestic interiors and gardens, the sentiments of Lord Henry from *The Picture of Dorian Gray*, Neiman Marcus Christmas catalogs, synesthesia and the films and music of Frank Zappa all play into a working paradigm caught somewhere between sweetness and perversity, irony and sentimentality.

Fine Arts Podcast
The Middle Ground, beginning at 1:00 pm until 4:00 pm

Session Chair: Donna Lee Kwon, Department of Music

This Podcast will be available for listening from 1:00-4:00 pm, on designated computers in the Middle Ground. At least one of the student collaborators will be in attendance and available for discussion from 2:00-4:00 pm.

Excursions in 'Podcasting' Asian Pop at Rhodes
Jennifer Brake
Brian Rudelson
Faculty Mentor: Donna Lee Kwon
Department of Music

From wax cylinders to MP3s, technological formats have been one of the main conduits of globalization in music since the early twentieth century. In this audio installation, Rhodes students will present their group projects in the form of six to ten audio "podcasts" that can be selected and listened to on select computer(s) on the Rhodes College campus. These thematically-constructed audio "podcasts" are meant to be heard not only as a creative engagement with Asian popular culture but with one of the modes of technology that may become increasingly influential in the circulation of various musics around the globe.

Additional Fine Arts Contributions to URCAS 2006:

The Gladys Cauthen Orchestra Soloist Competition

Thursday, April 27, 2006
3:30 p.m.
Tuthill Performance Hall in Hassell Hall

The program is presented in its entirety on page 8, following.

CODA pARTy on the green

The Green, Friday and Saturday, April 28 and 29, 2006

CODA pARTy on the green

The program is presented in its entirety on page 9, following.

Fine Arts – The Gladys Cauthen Orchestra Soloist Competition

Tuthill Performance Hall, Thursday, 3:30 p.m.

Ah! perfido, spergiuro, Op. 65 — Ludwig van Beethoven (1770-1827)
Emily Baldwin, soprano
Tom Bryant, piano

Am Bach legnt unterm Schattenbaum — Johann Christian Bach (1735-1782)
Susan Wang, soprano
Tom Bryant, piano

Piano Concerto No. 21 in C major, K. 467 — Wolfgang Amadeus Mozart (1756-1791)
Allegro maestoso — Tatiana Cerna, piano
Tom Bryant, piano

Laudate Pueri Dominum, RV 601 — Antonio Vivaldi (1678-1741)
Excelsus
Sicut erat
Amen — Amy Wells, soprano
Tom Bryant, piano

Piano Concerto No. 3 in C minor, Op. 37 — Ludwig van Beethoven (1770-1827)
Allegro con brio — Jo Beth Campbell, piano
Tom Bryant, piano

Le Nozze di Figaro, K. 492 — Wolfgang Amadeus Mozart (1756-1791)
Voi che sapete
Non so più cosa son, cosa faccio
Lindsey Cloud, soprano
Debbie Smith, piano

Linda di Chamounix — Gaetano Donizetti (1797-1848)
O luce di quest' anima — Amy Moore, soprano
Debbie Smith, piano

Piano Concerto No. 1 in E-flat Major, S. 124 — Franz Liszt (1811-1886)
Allegro maestoso
Quasi adagio
Allegro marziale animato — Rene Orth, piano
Brian Ray, piano

Fine Arts – CODA pARTy on the green
The Green, Friday and Saturday

CODA pARTy on the green

CODA Scholars:
Daniel Frankel
Lauren Kennedy
Evie Plumb
Meredith Reynolds
Casey Roman
Andrew Whaley
Stephanie Wilson
Christine Zhu
Staff Mentor: John Weeden, Assistant Director, CODA Scholars program

The arts have long been the medium by which humans express their inner vision and creativity. It is the intention of the CODA Scholars to heighten the profile of the arts on Rhodes College campus in the form of a two-day festival featuring all the areas of artistic endeavor that the college embraces through its academic curriculum, visual art, theatre, music and film. To this end, the CODA Scholars have formatted an event for their URCAS project on Friday, April 28 set in the Barrett Hassell green, involving an art exhibition of student work, three theatrical scenes, three bands, and CUP, the student improv theater troupe. Additionally, there will be a screening of student films in Fischer Gardens on Saturday, April 29. All events are intended to demonstrate the cultural vitality and rigor of the arts curriculum at Rhodes College, and the leadership skills developed over the past year by the CODA Scholars of Arts Leadership.

Friday, April 28, 2006

12:00 p.m.	Art Show Opens Barret Library, Java City, Bookstore patio
3:00 p.m. – 4:00 p.m.	Theatrical performances of Shakespeare Scenes from The Tempest, Midsummer Night's Dream, The Taming of the Shrew
5:30 p.m. – 9:15 p.m.	Bands on the Main Stage 5:30pm: The Byron McQuain Trio 6:40pm: Daniel Heacock 7:50pm: Cory Osborn
9:30 p.m. – 10:30 p.m.	CUP student theater group

Saturday, April 29, 2006

7:30p.m. – 8:00 p.m.	Acoustic music string ensemble
8:00 p.m. – 11:00 p.m.	Film Screenings Fischer Gardens

Humanities Oral Presentations — Session 1
313 Clough, beginning at 10:30 am until 12:15 pm

Session Chair: Jeffrey Jackson, Department of History

10:30-10:55 **The Dirty Hands of Empire: The British and the Mau Mau Insurgency**
Luke Archer
Faculty Mentor: Lynn Zastoupil
Department of History

In his book *Colossus*, Niall Ferguson argues that the United States should become Great Britain's heir as the next great liberal empire. According to Ferguson, the United States could follow its predecessor's example in promoting prosperity, stability, and liberal values in the world. However, such optimism about a new liberal empire must be viewed with a certain degree of skepticism. Though the British Empire is at times labeled "liberal," it also commonly exploited and subjugated the peoples that it conquered. The British Empire's experience in Kenya sheds light on the possibility of a liberal empire and thus the possibility of the American Empire that Ferguson envisions.

10:55-11:20 **Subtly Swayed: The Power of the Media in Shaping Public Opinion during the Boer War and the War in Iraq**
Marie Cour
Faculty Mentor: Lynn Zastoupil
Department of History

Towards the end of the 19th century, the British public became increasingly interested in their country's expanding empire, and they looked to national newspapers to learn about the remote territories they now ruled. During the Boer War England learned about the war from journalists stationed with the troops fighting the war, and consequently had great power in forming public opinion. During America's recent war in Iraq, reporters also had nearly limitless access to the decision makers, but Americans responded to the images very differently, and they influenced public opinion in profoundly different ways. This paper explores the relationship between the British government and newspapers during the Boer War and the American government and its embedded reporters during the Iraq War. How does the different medium effect the way people understand the events and form opinions on what happened? What are the consequences of the differences?

11:20-11:45 **The Loyal Traitors: Local Collaboration in the British Gulag in Kenya**
Lucy Mason
Faculty Mentor: Lynn Zastoupil
Department of History

An Examination of the relationship between loyalists and empire in Kenya in the late 1940s the British Empire began what would be termed its gulag against the Mau Mau movement. As the locals far outnumbered the Europeans in Kenya, Britain chose to use the local loyalist population to implement their policies. My paper will explore loyalists' reasons for supporting empire, concluding that most surrendered to fear, coercion or lust for power (perhaps even a combination of the three). My paper will then look closely at the differences in motivation between the British and the loyalists, and thereby to explore how the two interacted to achieve their own means. Finally my paper will relate previous experiences with empire to America's current situation with Iraq.

11:45-12:10 **The Antarctic Great Game: The United States and Oil Reserves in the South Pole**

Adam Doupé
Faculty Mentor: Lynn Zastoupil
Department of History

In *Colossus*, Niall Ferguson argues that the United States can in many ways be "Britain's successor as an Anglophone Empire." The Great Game, a rivalry between Britain and Russia over control of Central Asia, has received scholarly attention as an example of the British Empire's strength. The British example in Central Asia has very practical applications for looking at American foreign policy as well. In fact, the desire to maintain oil reserves in Antarctica, on the part of the United States, against intrusion from other foreign powers, forms one significantly clear parallel with the Great Game and thus makes a comparison of the two an ideal place to look at Ferguson's thesis.

Humanities Oral Presentations — Session 2

108 Buckman, beginning at 10:30 am until 12:15 pm

Session Chair: Rocío Rodríguez-del Río, Department of Modern Languages and Literatures

10:30-10:55 **Time in the World of Gabriel García Márquez**

Casey McElroy
Faculty Mentor: Rocío Rodríguez-del Río
Department of Modern Languages and Literatures

Gabriel García Márquez was born in Colombia and was raised by hearing "infallible" stories from his grandmother and aunts, which helped to form a basis for his magical realism. At the same time, Márquez grew up in a time of conflict, with many protests and military suppression of his town due to the authoritarian dictator. These he used to create many of his characters in his stories.

One of his greatest novels is One Hundred Years of Solitude, which was published in 1967. In the little town of Macondo, where the story takes place, the story revolves around the Buendía family. What characterizes the story of this family is the presence of a "cyclical cycle" within its different generations. This cycle is sustained by the attempts of each successive generation at overcoming the internal flaws of the previous one. One of the mechanisms that sets this in motion is the fact that each new generation also bears the names of the previous, thus the simple act of naming is just one of the many ways in which the reader can follow how the flaws are attempted to be conquered. The same names show how the people really do stay constant and that only outside factors change. Through the analysis of patterns such as these this paper will examine Márquez's construction of time as a means to discuss the impossibility of change and evolution in Latin American societies. The essay explores this issue through a study of the inevitable and somewhat predetermined failure experienced by the novel's characters, which are determined by their familial and social contexts.

10:55-11:20 **Conveying the Inconceivable: Time, Space, and the Reader's Universe in "El Aleph" and *Cien años de soledad***

Laura Groezinger
Faculty Mentor: Rocío Rodríguez-del Río
Department of Modern Languages and Literatures

The postmodern literary movement became popular in the 1960s and 1970s, a period commonly referred to as the post-Boom, following the period during which Latin American texts enjoyed increasing popularity in North America. More specifically, this term refers to literature that objected to earlier western modernism and its rigid standards.

This paper studies how postmodern Latin American writers Jorge Luis Borges, often called the father of postmodernism, and Gabriel García Márquez convey the abstract principles of space and time through texts that symbolically represent these concepts, thereby creating an alternative reality. The establishment of this reality depends upon the active participation of the reader, who, consequently, is forced to question and ultimately re-conceptualize his notion of the universe in terms of the metaphysical relationship between language and existence.

11:20-11:45 **Multiples Historias: Semiología y *La cena de Baltasar* por Pedro Calderón de la Barca**

William Corvey
Faculty Mentor: Rocío Rodríguez-del Río
Department of Modern Languages and Literatures

This project applies the field of Semiotics to *La cena de Baltasar* by Pedro Calderón de la Barca in order to examine the structural meaning inherent in the text's theatrical form. Through contextualizing and examining the genre, rhetoric, and theology of the text, the project shows the simultaneous availability of both purely biblical and more broadly ecclesiastical interpretations in the text, made visible through varying analytical methodologies.

11:45-12:10 **La reinterpretacíon contemporánea de la honra del Siglo de Oro en Crónica de una *muerte anunciada* por Gabriel García Márquez**

Jessica Murphy
Faculty Mentor: Rocío Rodríguez-del Río
Department of Modern Languages and Literatures

Gabriel García Márquez's novel *Crónica de una muerte anunicada*, addresses the issues associated with the Golden Age (Renaissance and Baroque) code of honor, namely the role of women according to the limitations established for them by society. The author is using Golden Age themes in a contemporary text to question the values of a society still dependent upon a social code established hundreds of years ago by a nation half a world away from him. García Márquez subverts the role of the woman, Angela Vicario, by giving her the power to establish and also to defend her own identity. The honor code in Angela's society differs from that of the Golden Age code because of the contemporary community's indecision about its existence in and/or relevance to their world. This paper will explore the contemporary attitude toward the honor code through the development of Angela, a dishonored woman, and the community's treatment of the Vicario family, both the dishonored sister and her murderous brothers who kill Santiago Nasar to restore the family honor. Finally, this paper will address the attitudes of Latin America toward Spanish values which have influenced their culture since the Spanish conquest of the New World.

Humanities Oral Presentations — Session 3

110 Buckman, beginning at 10:30 am until 12:15 pm

Session Chair: Gail Murray, Department of History

10:30-10:55 **Traffic Regulation or Racial Segregation: The Closing of West Drive and *Memphis v. Greene* (1981)**

David Tyler
Faculty Mentor: Timothy Huebner
Department of History

West Drive was a "through-street" that connected the Hein Park neighborhood (adjacent to the eastern edge of Rhodes College) with the Hollywood-Chelsea community to the north. After an extended seven year legal battle, however, in 1981 the United States Supreme Court upheld the

Memphis City Council's decision to close West Drive to northbound traffic by building a sidewalk across the street's northern terminus. It thus overturned the Sixth Circuit Court's ruling in favor of a group of petitioners from the Hollywood-Chelsea area, who claimed that the closing violated their rights under both the Thirteenth Amendment and extant federal civil rights law. While the sidewalk (upon which the case was premised) might at first appear to have been nothing more than a mundane triviality, the very fact that it made it all the way to the Supreme Court demonstrates that the closing entailed a much deeper significance.

My paper focuses on the legal atmosphere surrounding the closing, contextualized within the broader history of the Memphis Civil Rights Movement. My paper also discusses the major players who brought the suit on behalf of the Hollywood-Chelsea community, the grounds upon which they based their case, the history of similar jurisprudence, the case's evolution through the district and circuit courts, the Supreme Court justices who wrote opinions in *Memphis v. Greene*, and the neighborhoods out of which the case arose. I conclude by analyzing the Supreme Court's ruling, and evaluating its meaning within a city stigmatized by its tumultuous history of race relations.

10:55-11:20 **Using Concern, Not Emotion: The Role of Anona Stoner and the Biased Press in the I-40 Controversy**

Ashley Cundiff
Faculty Mentor: Timothy Huebner
Department of History

In the Interstate 40 controversy in Memphis, Tennessee, Citizens to Preserve Overton Park (CPOP) acted as the stalwart voice for those who opposed the path of the Interstate through the park. CPOP exhibited strong "matriarchal tendency" in its leadership, with six of its nine members on the governing board being women. Subsequently, CPOP received criticism not only because it held a controversial position against the proposed building of the interstate but also because of its female leadership team, with the press claiming that they had too much "emotion" and not enough "sense." Among these six women, Anona Stoner stood out. She acted as the secretary and spokesperson of CPOP but arguably, with her strong personality and experience, she held CPOP together. Ultimately, I am arguing that through her role in CPOP, Stoner drew criticism from the rhetoric of the press, mainly *The Commercial Appeal*, thus exposing a bias in the Memphis press against women taking controversial stances in politics.

11:20-11:45 **Interstate 40 through Memphis: Helping a City Evolve**

Leigh Clasby
Faculty Mentor: Jeffrey Jackson
Department of History

The reasons why Interstate 40 was never completed through midtown and downtown Memphis are not hard to discover. Citizens to Preserve Overton Park claimed it was an environmental hazard, bad for desegregated housing, too expensive, and destroyed the beauty of midtown. With all of these reasons against building the highway according to its original plan it is hard to imagine that there are any grounds for building the highway through the park. Nevertheless, there were many individuals who wanted the highway to go through midtown and downtown Memphis because they saw it as step to making Memphis a better city. This paper examines the people and reasons they had for supporting Interstate 40 through Overton Park.

11:45-12:10 **Overton Park: The Champion of the Progressive Era**

Deborah Rogers
Faculty Mentor: Timothy Huebner
Department of History

Overton Park is an integral part of the Memphis identity. It remains as an important physical record of history and contemporary culture. As a direct product of Progressivism, Overton Park's early development (1900-1910) demonstrated both the positive and negative effects associated with the

Progressive Era. Overton Park firmly established a culture of leisure at the turn of the century in its role as a place of weekend family refuge. In spite of these positive effects, Overton Park also served as a testament to the negative impact of Southern Progressivism, a paradoxical development process in which white city leadership encouraged the betterment of African Americans while simultaneously promulgating hierarchical segregation. Though city leaders committed themselves to ideals of social reform and improvement, racism encroached upon the Progressive Era and ultimately stained the city's history and development. Overton Park's earliest history clearly manifested both positive and paradoxical Progressivism in its promotion of the leisure culture and systematic segregation.

Humanities Oral Presentations — Session 4

313 Clough, beginning at 1:30 pm until 3:40 pm

Session Chair: Daniel Gates, Department of English

1:30-1:55 **Fashioning Women's Bodies: Hussein Chalayan and the Discourse of East and West**

Matt Lovett
Faculty Mentor: Judith Haas
Department of English

A designer from Turkey, Hussein Chalayan has become (in)famous throughout "high fashion" circles. Likened to a Conceptual or Minimalist artist, his work has dealt explicitly with the role of fashion and its effects on women (seen, for example, in his sugar-glass dresses of fall/winter 2000). His Spring 1998 show featured several dresses reminiscent of burqas. These pieces in particular sparked my interest in the way fashion (and not just "high" fashion) shapes the ways in which bodies, women's in particular, are viewed in and through their presentation in clothing. Fashion seems to construct boundaries of the body, and its particular cuts and locations certainly create a specific *image*, be it either of what women "should" look like, or how they "should" be represented. Chalayan's use of typical couture models (white, startlingly thin, etc) in burqas (one of which is naked except for the facemask) seems to make a commentary on the role of fashion in different cultural epochs, and provides a way into analyzing the role of dress in "western" versus "eastern" (or "middle-eastern") cultures, and specifically what fashion says about the bodies that reside underneath the dress.

1:55-2:20 **Comparable Death: A Comparison of Violence in the Bible and Violence in Rwanda**

Douglas Lensing
Faculty Mentor: John Kaltner
Department of Religious Studies

The legacy of identity-development due to religion has filled the history books for ages, but the legacy of violence due to identity has been skipped to some degree. Schwartz initially discusses how God's denial of Cain's offering establishes a concept of scarcity, which "prevails to dictate the terms of a ferocious and fatal competition" throughout the text. This competition serves as the catalyst for violence initiated to protect the arbitrary identity in biblical terms, but in the modern day as well. In 1994, the massive killing of 1,000,000 Rwandan men, women and children occurred due to an identity formation process, which was begun by the Belgians in the early part of the twentieth century. This paper will compare the violence established in the bible due to monotheism to its relation to the genocide in Rwandan, which was similarly based on the negation of another's identity.

2:20-2:45 **"Dreams of Men … Germs of Empire": Imperial Poetry of the Thames River**

Jim Kingman
Faculty Mentors: Michael Leslie[1] and Lynn Zastoupil[2]
Departments of English[1] and History[2]

The period from the mid seventeenth century to the early nineteenth century marked the rise and expansion of the British Empire. During this period, new political and commercial philosophy was mobilized as a small island developed a truly global trade empire. Poets of the era documented and fueled the nationalist imperial movement throughout the Empire's initial expansion. Central to the imperial poetry of the era was the Thames River. The symbolism of the river connecting London and all of Britain to the rest of the world helped garner the popular support of global trade expansion. The poems themselves became symbols of the empire and recorded the struggles and victories of imperial expansion by utilizing the Thames as an example of expansion, perfection, beauty, and, of course, Britishness. By analyzing the poetry of the imperialist era, one can both appreciate the historical context of the poems, the intrinsic literary value, and the consequential reaction to the poems. The Thames River and the poetry surrounding it represents a valuable tool for understanding the nature of the British Imperial movement.

2:45-3:10 **Constructing the New South, 1892-1930**

Jeffrey Knowles
Faculty Mentor: Timothy Huebner
Department of History

Business and political leaders in turn-of-the-century Memphis envisioned their city as integral to the New South movement—a mythic program to bring prosperity to the postbellum South. As a site for understanding New South rhetoric, architectural celebrations capture moments in Memphis' social, economic, and cultural history. Acting as New South myth-makers, outside investors, visitors, and members of the local business elite promoted the city through eloquent speeches, eye-catching newspaper graphics, and lofty editorials. The dedication ceremony of four Memphis structures functioned as the nexus of architecture and language, where a vision for Memphis was constructed both physically and culturally. By examining the public dedication ceremonies of the Great Bridge of Memphis (1892), the YMCA building (1909), the Sears Crosstown building (1927), and the Sterick Building (1930), this paper demonstrates how the rhetoric of celebration transformed these structures into idols of the New South.

3:10-3:35 **Intersection of Race, Class and Gender: 1980 Strike at Memphis Furniture**

Laura Dallas
Faculty Mentor: Michael Kirby
Department of Political Science

In 1980, a majority African-American female workforce went on strike at Memphis Furniture, ultimately winning union representation and a new contract. This event is particularly interesting in light of the long anti-union history in Memphis, and especially oppressive working conditions for black women. Why did these workers take this action, and what sustained them in this endeavor? The 1980 strike and its major actors, Memphis Furniture and Local 282, also provides a lens through which to view the larger trends and changes in Memphis manufacturing and unions, including the sharp decline of both in the 1980s.

Since there is limited labor history from this demographic, especially in the South, this project will shed new light on a chapter of Memphis' history. The data for this project will be collected from newspaper and other primary source material, and secondary sources will be utilized for context of these events. Oral interviews will provide a direct, grass-roots approach to collection of data. This study may find that dismal working conditions and beliefs and experiences from the Civil Rights Movement and the Sanitation Worker's Strike motivated workers to strike. Strong organizing, worker solidarity and personal religious beliefs are other possible influences. Another possible finding is that the1980 strike is a microcosm of overall Memphis manufacturing and union membership trends.

Humanities Oral Presentations — Session 5
108 Buckman, beginning at 1:30 pm until 3:15 pm

Session Chair: Eric Henager, Department of Modern Languages and Literatures

1:30-1:55 **Laura Esquivel: una voz feminina en una sociedad machista**

Brandi Pippin
Faculty Mentor: Rocío Rodríguez-del Río
Department of Modern Languages and Literatures

Mexican novelist Laura Esquivel has captivated her readers time and time again with her creative narrations of women and love in Mexican society. Gender roles in Mexico of the past and today are dictated by "Machismo" but feminism has begun to find its roots in places such as the novels of Laura Esquivel. Her first novel, *Como agua para chocolate* (1989) provides a truly feminine perspective in times of the Mexican Revolution in which "Machismo" dominates. A later novel, *La ley del amor* is actually set a Mexico City of the 23rd century where both genders find equality.

This paper studies the beneficial qualities of feminism in the "machismo" dominated societies of Latin America, specifically Mexico. Laura Esquivel, in much of her work, has provided a strong feminine voice that truly contradicts the male chauvinistic society. This paper will consider the affects of "machismo" on female roles in Mexican society from the time of the Mexican Revolution to the present and how Laura Esquivel's work and her feministic qualities contradict the standards for gender roles set forth by Mexican society.

1:55-2:20 **Gender, Politics and Violence in Elizabeth Burgos'** ***Me llamo Rigoberta Menchú y así me nacío la conciencia***

Emily Clark
Faculty Mentor: Rocío Rodríguez-del Río
Department of Modern Languages and Literatures

Testimonial literature looks at an individual's personal experience in a social and political context. The testimonial perspective tells a "true story" about the struggle of the main character, who usually speaks in first person. Much controversy has surrounded testimonial literature in recent years because of the question of truth. Since testimonial literature frequently has little documented evidence to support the truths presented therein, many critics scrutinize its usage in a global context, saying it only presents a biased perspective, but many still argue that it gives a unique perspective on events from a subject's distinct position.

This paper examines the employment of a testimonial style to denounce the violence against the indigenous people of Guatemala in Elizabeth Burgos' Me llamo Rigoberta Menchú y así me nació la conciencia. Extreme violence and rape against the family and friends of Rigoberta Menchú are central themes of the text that elucidate the suffering of marginalized groups and show the effects of violence in a personal and disturbing way that is unique to this text. This paper also examines the role of power in violence against women and minority groups who are mistreated by society because of their race. The goal of this analysis is to better understand how literature depicts violence as it pertains to indigenous populations and women in particular. The paper also treats controversies surrounding the publication of this testimony, and attempts to establish the importance of the novel, regardless of its accuracy.

2:20-2:45 **At the Mercy of the Panopticon: The Superficiality of the Moral Control in *La Casa de Bernarda Alba***

Claire Singleton
Faculty Mentor: Rocío Rodríguez-del Río
Department of Modern Languages and Literatures

Federico García Lorca's theatrical masterpiece *La Casa de Bernarda Alba* invites us inside of the blank, white walls of Bernarda's house, where her constant vigilance and rigid authority impose a relentless system of moral order upon her five adult daughters. Written in Spain in 1936, *La Casa de Bernarda Alba* is highly evocative of the tumultuous social and political conditions of the era. The conflicts present in Bernarda's house conspicuously reflect the atmosphere of 1936 Spain, when social and religious pressures were intense and Civil War was brewing. Moreover, Franco's tyrannical regime is undeniably foreshadowed in the dictatorship Bernarda herself has established within *la casa*.

This paper will examine the parallels between Bernarda's house and the sociopolitical context of 1936 Spain and will furthermore address the duality of Foucault's panopticon, a prison-like structure which relies upon vigilance to effect control over desired subjects, as related to Bernarda's existence. She is submitted to a larger panoptical system of moral control governed by traditionalism and reputation, namely the sociopolitical forces of 1936 Spain, while simultaneously administrating her own panopticon within the domain of her household. Thus the outermost panopticon which generates and regulates Bernarda's value system both births and nurtures the innermost panopticon she has constructed within her house. What will ultimately prove significant, however, is the underlying hypocrisy behind the motivations of those administrating their respective panoptical systems of moral regulation. The reputations and the continued existence of those in control are ultimately dependent upon the proper functioning of their power systems. Consequently, the administrators are concerned only with the superficial success of their desired moral control and are thus in frequent denial of the true internal condition of their subjects.

2:45-3:10 **Exploring the Post-Dictatorial Community in *La Muerte y La Doncella* by Ariel Dorfman**

Chasie Wallis
Faculty Mentor: Rocío Rodríguez-del Río
Department of Modern Languages and Literatures

While in political exile from the country of Chile during the dictatorship of Augusto Pinochet from 1973-1990, Ariel Dorfman conceived the story of a man whose wife realizes simply by the sound of his voice that a stranger her husband has brought home is the man who tortured and raped her many years before. The author wasn't yet sure how to contextualize the story, so it wasn't until he returned home that he realized Chile's new state of transition to democracy was the perfect setting in which to base his characters. Chile was in the midst of recovering from the torture and repression of Pinochet's regime, and even though governmental bodies were being put in place to investigate the crimes of the dictatorship, the country remained in a state of distrust because the military was still highly influenced by Pinochet. This gave Dorfman the perfect scene for his play *La Muerte y La Doncella*. The characters show the relationship between a tortured woman, her husband who is part of an investigatory body, and a doctor from Pinochet's former regime. Each person plays a clear role in depicting how different groups within the Chilean society responded to their own experiences of the dictatorship.

What is less obvious, though, is the way in which the play deals with the idea of community, a foundational element of Latin American Literature. Dorfman's characters form their own small community within the context of the much larger community of Chile and Latin America. It is the complexity of these relationships that leads me to investigate the Latin American sense of community. More specifically, I will use *La Muerte y La Doncella* as a guide to define how the political and psychological aspects of the Chilean community during the post-dictatorship period of transition and recovery interact to redefine and magnify the meaning of community to individuals and the country itself. This research will be presented in Spanish.

Humanities Oral Presentations — Session 6
110 Buckman, beginning at 1:30 pm until 3:15 pm

Session Chair: Katherine Panagakos, Department of Greek and Roman Studies

1:30-1:55 **Scythian Tombs and Burial Rituals in Herodotus and Beyond**
Mackenzie Zalin
Faculty Mentor: Katherine Panagakos
Department of Greek and Roman Studies

The Greek historian Herodotus presents the modern scholar of antiquity with an unprecedented account of the epic struggle of the Persian wars which took place during the early portion of the 5th century BCE throughout Europe and Asia. In addition to detailed descriptions of the war itself which pitted such notable figures as Themistocles and Leonidas against the might of the Persian Empire, Herodotus' inquiries into various peoples and cultures apart from Greek achievements distinguish the *Histories* as a crucial work of anthropological and sociological merit. One of the most fascinating and least known cultures includes the Scythians, an advanced society whose empire extended from the Russian steppes across Asia into Eastern Europe over a thousand year period. Many of the strange customs regarding Scythian burial practices and rituals presented in Book IV of the *Histories* have recently been called into question as a result of striking new archaeological finds that lend credence to many of Herodotus' claims and refute just as many which are poised to establish a brand new perspective on an enigmatic and oft misunderstood culture.

1:55-2:20 **Sacrifice in Germania**
Andrew Willey
Faculty Mentor: Kenneth Morrell
Department of Greek and Roman Studies

Animal and human sacrifice has proven to be a puzzling aspect of human societies on account of its ubiquitous nature across many disparate cultures. Some recent theories, however, have attempted to shed light on the origin and function of these mysterious practices. Walter Burkert and Rene Girard are among those who have advanced new theories. Both claim that animal sacrifice resolves a particular problem for 'primitive' societies, and indeed that, for such cultures, a failure to perform sacrifice might lead to societal breakdown. The Romans and Greeks, in Caesar's day, were already too advanced to qualify as 'primitive' in this sense, but Caesar's famous opponents, the Germani, were not. So in Julius Caesar's *Bellum Gallicum* and Tacitus' *Germania* we have an opportunity to examine two brief snapshots of a primitive culture's changing use of sacrifice over time. We can then use this analysis to critique the theories of Burkert and Girard.

2:20-2:45 **From Persia to Rome**
Alex Livingston
Faculty Mentor: Kenneth Morrell
Department of Greek and Roman Studies

The Cult of Mithras, a Persian mystery cult, spread to the Roman Empire from the near East. This cult did not merely crop up on the out skirts of the Empire but all over, including Rome and had members from many levels of Roman society. I intend to explore the rituals and myths associated with the Cult of Mithras in an attempt to understand why and how it spread so far and through so much of Rome's population. This exploration will include an examination of textual as well as nontextual evidence.

2:45-3:10 **The Dual Nature of Ritual in the *Pomerium***

Andrew Svec
Faculty Mentor: Kenneth Morrell
Department of Greek and Roman Studies

The *pomerium* is the ancient circle that encircles the city of Rome. Founded by Romulus, the *pomerium* consisted of a wall that provided both physical and spiritual barriers. Physically, it was the point past which no army was supposed to enter Rome. Spiritually, the *pomerium* was what made Rome sacred and allowed for the taking of auspices within its walls. Due to this dual nature, there were several rituals that revolved around the *pomerium*. One was the issue involving a Roman triumph, which was one of the only times soldiers were allowed into Rome so that they could celebrate a military victory. Another was the Lupercalia; a purification ritual that supposedly was started by Romulus and Remus. The anthropologist Arnold van Gennep examines the significance of boundaries in his *Rites of Passage*. I intend to look at these various rituals and analyze their significance in accordance with what van Gennep says.

Humanities Poster Presentations

Buckman Foyer, beginning at 11:00 am until 3:00 pm

Session Chair: Ryan Byrne, Department of Religious Studies

All posters will be available for viewing from 11:00 am to 3:00 pm. At least one of the student collaborators will be in attendance and available for discussion from 1:00-3:00 pm.

The Correlation between Sex Education and Teen Pregnancy in Low Income Neighborhoods

Kate Bartholomew
Chris Chugden
Margaret Works
Lora Terry
Faculty Mentor: Gail Murray
Department of History

The Presentation will discuss and analyze the effects of sex education in Memphis City Schools by evaluating the frequency of teen pregnancy in low income neighborhoods. Our goal is to find a correlation between what is taught in school and what is actually occurring among teenagers. Depending on our conclusion, we will also compose suggestions and methods that could enhance the effectiveness of sex education in Memphis City Schools.

How Difficult Is It for People in the Hollywood-Springdale Community to Obtain Prescriptions?

Ellie Hahn
Daniel Hammond
Bethany Lindaman
Carrie Osborne
Faculty Mentor: Gail Murray
Department of History

Recent TennCare cuts in Tennessee have posed challenges for many low-income people wishing to obtain prescription medicines. The proposed research project will ask how difficult it is for people in the Hollywood-Springdale community to obtain their prescription drugs. In order to gather information, the researchers will research the TennCare program and its effect on access to prescription drugs. The researchers will investigate the prices of the most common prescription medicines needed in the Hollywood-Springdale neighborhood and will

investigate prescription assistance programs for people in need. The researchers expect to find that current TennCare policies do not provide sufficient coverage for many people in the area needing assistance for prescription drugs.

The Effect of Trash on Neighborhood Communities

JoAnna Halk
Marianne Olson
Nicole Wellford
Faculty Mentor: Gail Murray
Department of History

Our research team will look into issues of the development of 'trash', particularly large items such as cars or house hold furniture, in communities like Hollywood Springdale and the effect it has on the community. We will analyze the issue of trash as it relates to poverty; is the cost of getting rid of large items a large barrier to many individuals or is it a result of a "culture of poverty". In this study we will also take note of neighborhood community organizations, such as RHSP and VECA, and compare their role in neighborhood clean-up projects and any success, failures, or advantages they encounter.

Differentiating Child Care and Grocery Store Standards in Dissimilar Neighborhoods

Matthew Grosmann
Victoria McCullough
Tevari Butler
Jazmin Miller
Jason Jordan
Faculty Mentor: Gail Murray
Department of History

The group led by Matthew Grosmann in History 205, the history of poverty in the United States, will be using the Hollywood Springdale neighborhood and a more affluent neighborhood to compare the quality of grocery stores and child care facilities. Regarding child care, we will be assessing the following things: quality of service, quality of the environment, what origin people are hired from, price discrimination, and accessibility. The characteristics that will be analyzed in grocery stores are: pricing strategies, goods available, quality of goods, and quality of service. For example, since the price of the goods and services is an overlapping concern of our group, we will address the inefficiencies associated with consumer welfare when third-degree price discrimination is applied. As a group, our goal is to provide conclusive evidence that low income communities often have fewer adequate choices and may pay more for that which is available. The means used to prove this will be through visual observations, personal interviews, and data collection.

Price Discrimination in Rent Based on Location

Melanie Matthews
Mary-Catherine Burgoyn
Dan Wright
Lucy Coolidge
Faculty Mentor: Gail Murray
Department of History

We will be doing empirical research in the neighboring communities to find out about the differences in rent pricing and the amenities offered. Our group contains members of both sexes and we will try to ascertain whether or not the different gender roles play a difference in the interview/rent process.

Natural Science Oral Presentations – Session 1
225 Ohlendorf, beginning at 10:40 am until 12:00 pm

Session Chair: Chris Seaton, Department of Mathematics and Computer Science

10:40-11: 00 **Atmospheric Effects on a Baseball**

Jeff France
Faculty Mentors: Ann Viano and Jay White
Department of Physics

It is no secret that Colorado is a tough place for pitchers to be successful in baseball. Coors Field in Denver, Colorado has been referred to as a burial ground for pitchers. In the past ten years, the average total runs scored per game at Coors Field is 15.1 runs per game, while the average for all of Major League Baseball is 8.7 runs per game. The reason pitchers struggle so much in Colorado can be largely attributed to the altitude. As the altitude increases, the air pressure decreases, leading to a few effects that provide the hitter with a clear advantage. As the air pressure decreases, the ball will travel farther due to a decrease in air resistance. Also, because the force on the ball resulting from spin is directly proportional to the density of air, the magnitude of the force decreases at high altitude. I found a curveball to break 20% more at sea level than a mile high, and a batted ball travels 7.5% farther a mile high.

11:00-11:20 **"PhotoSynthesis" Computer Imaging Application**

Blake Anderson
Stephen Ash
Brian Eason
Chuck Stinemetz, Department of Biology
Faculty Mentor: Robert England
Department of Mathematics and Computer Science

"PhotoSynthesis" is a new computer imaging application developed at Rhodes College by the presenters for use in biology research projects. With the PhotoSynthesis software and a digital camera, users can create and catalog time-lapse photography experiments that simply and accurately monitor such statistics as the area-growth of a root over time, the absolute or relative growth rate of a root tip, and the change in curvature of a growing root. The data collected for such an experiment can be exported into Microsoft Excel for further analysis.

11:20-11:40 **Explosion Points of Indecomposable Functions**

Michael Siler
Faculty Mentor: Chris Mouron
Department of Mathematics and Computer Science

Some functions when repeatedly composed with themselves can display chaotic behavior. We will consider a certain type of chaotic behavior known as explosion points, and what it takes to produce them. I will explain what is meant by "explosion point" and the related forms of chaotic behavior that I am studying for my senior research project.

11:40-12:00 **A Computer Algorithm for Aligning Musical Variations**

Tobias O'Leary
Robert England
Faculty Mentor: Robert England, Department of Mathematics and Computer Science

Questions typically addressed when automatically analyzing a set of musical variations by computer include which variations of the set are most similar to one another and what parts of these variations contribute to the similarity. Prior work by Mongeau and Sankoff addresses this problem by

aligning the melodies of variations using a well-known string matching algorithm. Our new algorithm builds upon their algorithm by representing variations hierarchically, and modifying the standard string matching algorithm to operate on this new representation. The result is an algorithm that considers the deeper structure of musical pieces when aligning, rather than considering the melodic surface alone.

Natural Science Oral Presentations – Session 2

Frazier Jelke Lecture Hall B, beginning at 1:00 pm until 4:00 pm

Session Chair: Loretta Jackson-Hayes, Department of Chemistry

1:00-1:20 **Physics and RC Car Racing: Creating a Better Shock Absorber with Magnets**

Paul Sinclair
Faculty Mentor: Brent Hoffmeister
Department of Physics

Current air-oil shock absorbing systems on 1/10th scale radio controlled off-road race cars work well, but require continual maintenance to stay in optimal operating condition. The goal of this research is to design a novel suspension system using magnets to achieve similar performance with less maintenance. We first determined that the following physical characteristics should be used to describe the performance of a suspension system: suspended mass, spring rate, and damping coefficient. These parameters were then measured on a conventional coil-spring, air-oil system. We next designed a magnetic system in which a repulsive force between permanent magnets substituted for the coil spring, and eddy currents generated by motion of the magnets near a conductor provided the damping. We will compare the physical characteristics of this novel magnetic design to those of the conventional air-oil design.

1:20-1:40 **Ultrasonic Backscatter from Bone as an Indicator of Density and Mechanical Strength: A Multi-Frequency Approach**

David Johnson
Faculty Advisor: Brent Hoffmeister
Department of Physics

Ultrasonic backscatter techniques have been demonstrated to be a promising method to characterize tissues such as bone. The purpose of this study was to expand past research which correlated backscatter to bone density to a range of 5 frequencies: 1, 2.25, 5, 7.5, and 10 MHz. Human bone obtained from 10 femurs from 7 donors and was prepared into cubic specimens with side lengths of approximately 1.5 cm. The specimens were scanned using a mechanical system which obtained backscatter signals from an array of a large number of points on each bone sample. The data was processed at each point using two separate parameters: Frequency Slope of Apparent Backscatter (FSAB) and Time Slope of Apparent Backscatter (TSAB). FSAB describes the slope of the frequency dependence of the power of the backscattered signal. TSAB represents the time dependence of the average power of this signal. The specimen densities were measured using quantitative computer tomography and bone strength was determined using a mechanical testing frame. Mechanical strength and density demonstrated significant linear correlation to both FSAB and TSAB at 5, 7.5, and 10 MHz with R^2 values ranging from 0.70 to 0.88, indicating that these parameters may have future clinical uses.

1:40-2:00 **Orbital Dynamics of Electrically Charged Spheres**

Desmond Campbell
Kevin Andring
Daniel Keedy
John Janeski
Sean Quinn
Faculty Mentors: Brent Hoffmeister and Shubho Banerjee
Department of Physics

Through an undergraduate competition sponsored by NASA's Reduce Gravity Student Flight Opportunity Program (RGSFOR), our team has been given a grant of time on NASA's modified C-9B aircraft that simulates a microgravity environment. Columb's Law and orbital motion equations predict that the electrostatic forces between two oppositely charged spheres will allow a small sphere to orbit a larger, stationary sphere. To the knowledge of the team, this has never been demonstrated macroscopically. By using a high voltage power supply, we will charge a stationary metal sphere (radius ≈ 6.5 cm) with a voltage on the magnitude of 10 kV and a smaller sphere with an equal and opposite voltage on the order of -10kV. Data will be collected using two video cameras and analyzed using video motion software to verify our theoretical predictions. This presentation will cover the initial conditions and derivations for the creation of a stable orbit in a microgravity environment, as well as all the ground test and preparations before the team's flight date.

2:00-2:20 **Visual System Development in Children with Retinoblastoma**

Scott Barb[1]
Faculty Mentors: Mauricio Cafiero[1] and Ann Viano[2]
[1]Department of Chemistry
[2]Department of Physics

Retinoblastoma, a childhood cancer of the eye, affects children during the first 3 years of life, a time of rapid development in the nervous system. Visual outcome is variable in survivors of retinoblastoma, and little is known about the effects of disease and treatment on the development of the neural systems for vision in the brain. Functional magnetic resonance imaging (fMRI) and diffusion tensor imaging (DTI) provide insight into the development of the visual system in this longitudinal study of retinoblastoma patients. The blood-oxygen level dependent (BOLD) effect associated with fMRI is often used to approximate activation in the brain due to a stimulus. DTI provides structural developmental patterns associated with certain diffusion parameters. Our current fMRI and DTI data show the feasibility of both techniques in our patient set. This longitudinal study will document the development of neural systems for vision in patients with retinoblastoma and changes associated with therapy and extent of disease. These findings may also help to clarify unresolved questions regarding developmental changes in the BOLD signal.

2:20-2:40 **p53 induces cell death through the autophagy pathway**

Pamela Freire
Asit. Dr. Frank Dorsey[1]
Faculty Mentor: Darlene Loprete [2]
[1]Department of Biochemistry, St. Jude Children's Research Hospital
[2]Department of Chemistry

The tumor suppressor protein, p53, is a transcription factor that negatively regulates the cell cycle. p53 mutations are found in half of all tumors. The tumor suppressive functions of p53 rely upon its ability to bind DNA and upregulate the transcription of apoptosis-inducing genes such as Bax and Puma. The ability of p53 to induce apoptosis is one important mechanism restricting tumor development. Interestingly, we have found that p53 also regulates autophagy, a cell death/survival pathway. Autophagy is a process by which cells send cytosolic material to the lysosome for degradation during starvation. However, recent data suggest that extensive autophagy initiates cell death and plays an important role in tumor suppression. Treating Eμ-Myc precancerous mice with

chloroquine (CQ), an antimalarial drug that activates autophagy, severely delayed tumorigenesis. Furthermore, we have found that CQ induces cell death independent of the normal apoptotic machinery. The death induced by CQ is dependent upon p53, but independent upon p53's ability to bind DNA, indicating that its role in tumor suppression is not solely dependent on its functions as a transcription factor. Together, our data suggest that CQ induces an alternative, p53-dependent, form of cell death and that p53 induction could lead to autophagic death.

2:40-3:00 **Phenylalanine Hydroxylase: Substrate and Inhibitor Binding Modeled with DFT and *ab initio* Methods**

Andrew Godfrey-Kittle
Faculty Mentor: Mauricio Cafiero
Department of Chemistry

The enzyme Phenylalanine Hydroxylase catalyzes the conversion of phenylalanine to tyrosine, which is in turn converted to a series of neurologically important compounds. These compounds can then inhibit the initial metabolism of phenylalanine by docking in the Phenylalanine Hydroxylase active site. We use second order Moller Plesset theory (MP2) and several Density Functional Theory methods to estimate the contribution to the total substrate interaction energy from the electrostatic and dispersion interactions between the substrate and Phe254 in the enzyme. We then allow Phe254 to mutate into Glycine, Lysine, Leucine, Isoleucine, Tyrosine, and Tryptophan and calculate changes in the interaction energies. L-DOPA is the most strongly binding inhibitor, though the interaction energy is much less than that of the natural substrate, Phenylalanine. When mutated, the changes in interaction energies predict a loss of function for the protein.

3:00-3:20 **Strength of activation and FOXP3 expression affects CD4+CD25+ regulatory T cell function**

Amie Cahill
Faculty Mentor: Jay Blundon
Department of Biology

A small subset of naturally occurring CD4+CD25+ T cells (Tregs) have been shown to suppress and regulate immune responses in the context of autoimmunity, transplantation, and infection. The critical role of these cells in mediating tolerance is indicated by individuals lacking these cells developing a fatal autoimmune syndrome. Such syndromes are characterized by mutations in the transcription factor FOXP3. Considerable effort has been placed on elucidating how these cells function, with the aim of harnessing that power to therapeutically modulate immune-mediated diseases in the clinical setting. Tregs represent 1-9% of CD4+ T cells in human peripheral blood. Hence, it is significantly challenging to generate sufficient numbers for therapeutic use, but also highly desirable. Generated in sufficient numbers and manipulated to control the strength and duration of suppressor activity, protracted and excessive immunosuppression can be eliminated. We are optimizing a range of expansion protocols for generating Tregs with maximal efficacy. As expected, strong stimulation of Tregs increases the level of their expansion. Through analysis of FOXP3 expression by flow cytometry, we show that there is a correlation between FOXP3 expression and immunosuppression. As Tregs are more strongly activated, FOXP3 expression declines and as FOXP3 expression declines, the efficiency of Treg immunosuppression is diminished.

3:20-3:40 **Assembly of a Paramyxovirus: Matrix protein interaction with other viral proteins and cellular actin as revealed in transfected cells by Confocal microscopy**

Suvi Murti
Dr. Allen Portner, Department of Infectious Diseases, Division of Virology, St. Jude Children's Research Hospital
Faculty Mentor: Gary Lindquester
Department of Biology

To understand the role of M protein of Sendai virus (SV) in the assembly and budding of the virus, 293T cells transfected with cDNAs for the viral genes were examined by immunofluorescence / Confocal microscopy. The transfections were done either individually with M, NP, HN, and F cDNAs or doubly with M cDNA and one of the other cDNAs. To detect the interaction of cellular actin with M, the cells transfected with M were labeled for actin using fluorescent-phalloidin. The studies showed that the primary location of M is at the plasma membrane whereas NP is distributed throughout the cytoplasm; both HN and F accumulate at the membrane as well as in Golgi. All three proteins (M,HN,and F), also show a low and diffuse cytoplasmic staining. In double-transfected cells, M colocalizes with HN, F, NP, and with cellular actin at the membrane. These observations suggest that: (1) M goes directly to the membrane after synthesis whereas HN and F traverse via the Golgi compartment, (2) NP is synthesized throughout the cytoplasm, and (3) M interacts with cellular actin at the membrane. These results were also verified by a similar analysis of proteins in SV virus-infected 293T and MK2 cells.

3:40-4:00 **The role of light and oxygen in *Chaoborus punctipennis* (Insecta: Diptera) diel vertical migration**

Mark Stratton
Faculty Mentor: David Kesler
Department of Biology

Aquatic phantom midge larvae (*Chaoborus punctipennis*) exhibit diel vertical migration (DVM) in response to fish visual predation, remaining in deeper waters during the day and ascending nocturnally to feed. Light intensity and dissolved oxygen concentrations are hypothesized to determine the depths where larvae are found during daylight hours. Samples were collected in Yellow Poplar Tree Lake, Millington, TN before and after sunset during a day in March, April, May, July, and September of 2005. Average daytime depth (D_C) and use of daytime refugia (dark or hypoxic waters) significantly increases ($P<0.05$) with instar stage (I & II<III<IV). IV instars utilized hypoxic waters ($DO_2<3.5$ mg/L) more than III instars, while I & II instars did not use this refuge. IV instars remained below maximum light penetration (1.0 $\mu E/m^2/sec$) in May, July, and September, III instars only in July and September, and I & II instars only in September. These behavioral differences among instars are likely due to varying metabolic needs and visual predation vulnerability. Further, IV instar D_C significantly correlates to the critical oxygen threshold for fish ($DO_2=3.5$ mg/L) ($R^2=0.7826$, df=11, $P<0.01$) but not to maximum light penetration ($R^2=0.183$, df=11, $P>0.05$), indicating oxygen as the overriding stimulus governing DVM seasonal changes.

Natural Sciences Posters – Session 1: Chemistry and Physics posters
Frazier Jelke Lobby, beginning at 1:00 pm until 3:00 pm

Session Chair: Mary Miller, Department of Biology

All posters will be available for viewing from 1:00 to 4:00. At least one of the student collaborators will be in attendance and available for discussion from 1:00-3:00 pm. If a specific collaborator is presenting, that coauthor name is underlined.

Varying Severity of Phenylketonuria Based on Strength of Binding of Mutated Enzymes to the Cofactor BH4

Jessica Cross
Faculty Mentor: Mauricio Cafiero
Department of Chemistry

Phenylketonuria is a neurological condition that results from the inability of phenylalanine hydroxylase (PheOH) to metabolize phenylalanine (Phe), usually caused by point mutations in the gene that codes for PheOH. The action of PheOH depends on the strength with which it binds to its cofactor BH4. Point mutations in PheOH often diminish the strength of binding between the enzyme and cofactor, resulting in a less active enzyme which

thus cannot metabolize phenylalanine, causing phenylketonuria. Several quantum mechanical methods were used to calculate the binding energy between BH4 and several mutants of PheOH. We show several mutations that both decrease and increase the binding of the cofactor. This molecular level understanding of projected degrees of severity of phenylketonuria and their likelihood provides an accurate paradigm around which to base further projections of other mutations that may cause or augment phenylketonuria. Furthermore, the degree of accuracy obtained from the cheapest method of binding analysis as compared to the most accurate known method of analysis has shown that only a certain level of quantum mechanical accuracy is necessary in order to determine an adequate binding energy between BH4 and a mutated enzyme.

Extraction studies on *Solidago odora* (sweet goldenrod) directed towards the isolation of new medicinal compounds

Amie Demmel
Harold Robinson[1]
Stanwyn G. Shetler[1]
Faculty Mentor: Richard Redfearn[2]
[1]Department of Botany, Smithsonian Institution, National Museum of Natural History, Washington, DC
[2]Department of Chemistry

The inspiration for many of today's drugs comes from chemicals that have been isolated through extraction of traditional medicinal herbs. *Solidago odora* (or sweet goldenrod) is considered a medicinal plant by the Choctaw Tribe and has been used for a number of aliments throughout the centuries. Crude extractions of this plant indicate a number of potentially interesting compounds, including nitrogen containing species which most likely are alkaloids, through the use of GC-MS. Dragendroff's reagent also seems to verify the presence of alkaloids. These studies will direct future research and eventual isolation of potentially novel, biologically active compounds.

Non-Born-Oppenheimer Densities for the LiH Molecule in Static Electric Fields

John Gehrig
Faculty Mentor: Mauricio Cafiero
Department of Chemistry

We calculate electron and nuclear densities for the proton in the LiH molecule without assuming the Born-Oppenheimer approximation. Densities are obtained from calculations using a basis set of 250 floating, spherical explicitly-correlated Gaussian basis functions. The basis functions are optimized with respect to linear and non-linear variational parameters using analytical gradients in a truncated Newton-type optimization routine. We have applied static electric fields of various magnitudes, showing how the nuclear density deforms and changes as we approach the dissociation limit, at which the outermost electron leaves the molecule. We also report the non-Born-Oppenheimer dipole moment and polarizability of LiH, which support the accuracy of our calculations.

Laser Ablation ICP-MS Analysis of Prehistoric Rock Paints

Tristan Hill
Faculty Mentors: Chris Mouron[1] and Jon Russ[2]
[1]Department of Mathematics and Computer Science
[2]Department of Chemistry

Prehistoric rock paint samples from southwestern Texas and southern California were analyzed using laser ablation ICP-MS. The samples contained either red or black paint found between a thin (~ 100 μm) oxalate coating and limestone substrate. The objectives of the study were to establish the elemental and isotopic composition of the paints, and to investigate whether chemical signatures in the paint would reveal relationships between various pictographs, sites, and motifs. The resulting elemental and isotopic data show that the red paints are rich in Al, Cr, Fe, and Ni, while black paints are mainly Mn. Ward's Method of cluster analysis is being applied to data sets that contain 10-15 elements that appear to be characteristic to the paints.

Optimization of Pulse Tube Refrigerator Components

John Janeski[1]
Peter Bradley[2]
Michael Lewis[2]
Ray Radebaugh[2]
[1]Department of Physics, Rhodes College
[2]Cryogenics Division, National Institute of Standards and Technology, Department of Commerce

Cryocoolers have many applications in space, military, medicine, and telecommunications that require them to be small, durable and able to deliver temperatures below 20 K. The pulse tube refrigerator is a regenerative refrigerator that utilizes a simple valve less compressor and operates at a fairly low pressure of 2.5 MPa; each of these characteristics tends to increase the durability of the cryocooler. To build a refrigerator that meets these requirements, each component needs to be optimized under these conditions. First, this project examines a regenerator material operating between 20 K and 4 K for higher frequency operation at 60 Hz. Initially, spheres of lead approximately 127 micrometers (0.005 inches) in diameter are to be evaluated. Model predictions show the greatest energy loss contributor at temperatures lower than 30 K is from energy lost due to imperfect heat transfer. Secondly, this project explores the phase shifting component referred to as an inertance tube. This segment measures the phase shift between the mass flow and pressure flow as a function of acoustic power input while coupled with different size reservoirs also at 60 Hz operation. Finally, we discuss the apparatus design and construction for both project goals as well as measurements.

Diagnosing Osteoporosis with Ultrasound: A Novel Single Probe Technique

Daniel Keedy
David Johnson
John Janeski
Faculty Mentor: Brent Hoffmeister
Departments of Physics

Osteoporosis is a degenerative bone disease that results in more than 1.5 million fractures annually, including approximately 300,000 hip and 700,000 vertebral fractures (NIH). Early diagnosis is the first critical step toward effective treatment. Ultrasonic bone densitometry systems offer notable advantages over currently employed x-ray diagnostic systems, including lower cost, greater portability, and the lack of ionizing radiation. However, a major disadvantage of commercially available ultrasonic systems is that they require a separate ultrasonic transmitter and receiver, making measurements at clinically important sites such as the hip and spine difficult or impossible to make. To address this limitation, we have developed a new ultrasonic technique that uses a single ultrasonic probe. The probe transmits ultrasonic pulses into the bone and then receives the returned (backscattered) signal. We performed single-probe ultrasonic backscatter measurements on 25 specimens of human bone of varying densities. The backscatter signals were analyzed to determine the average backscattered power returned from the bone specimens. We found that the backscattered power exhibited a highly significant linear correlation with the density of the specimens. This suggests that single-probe ultrasonic backscatter techniques may be a useful tool for detecting density changes in bone associated with osteoporosis.

Implosion Dynamics of Metal Cylinders

Chase LaFont
Jennifer Thompson
David Welch
Faculty Mentors: Brent Hoffmeister
Department of Physics

A common and dramatic physics demonstration involves the rapid implosion of a 55 gallon barrel. This is performed by replacing the air in the barrel with steam and then rapidly cooling the barrel so that the steam condenses producing a vacuum. We noticed that the barrel always seemed to implode in such a way that the cross-sectional geometry of the barrel was approximately triangular, meaning that the geometry was characterized by three vertices. We hypothesized that the number of vertices may depend on the following factors: height to radius ratio of the barrel, rate of pressure change, and/or imperfections in the surface features of the barrel. To test this hypothesis,

we developed a procedure to slowly and rapidly reduce the pressure in aluminum cans with different height to radius ratios. In addition, we developed an apparatus that could systematically induce dents in the surface of the can. We will present how the number of vertices of the crushed geometry depends on the shape of the metal cylinder, the rate at which it is crushed, and surface imperfections.

Solubilizing Chlordane and Related Compounds in Aqueous Solutions of Cyclodextrins

Rachel Methvin
Faculty Mentor: Richard Redfearn
Department of Chemistry

The remediation of chlordane and related compounds once they are released in the environment has been a cause for concern for the scientific community ever since they were discovered to be carcinogenic. These compounds are particularly difficult to remediate because they are insoluble in water. This project is attempting to solubilize chlordane and related compounds by creating a host-guest complex between the compound of interest and both β- and γ-cyclodextrin. We theorize that the insoluble chlordane compounds will bind within the hydrophobic center of the cyclodextrin ring while the outside of the ring will remain hydrophilic. This will allow the entire complex to remain water soluble and provide easier transport of the harmful compounds out of the environment. Preliminary results show some differentiation in solubilizing power between β- and γ-cyclodextrin, as expected.

Effect of codon linker length on chromophore activity of a Green Fluorescence Protein fusion protein

Leah Pranger
Sonia Nkashama
Faculty Mentor: Loretta Jackson-Hayes
Department of Chemistry

Our laboratory is studying the cellular localization of an *Aspergillus nidulans* gene (mannose transporter, MT2) that has been shown to be essential for cell wall stability. Protein *O*-mannosyltransferases in *Saccharomyces cerevisiae* attach *O*-linked mannosyl residues to proteins in the ER and have been shown to be required for cell wall integrity and normal cell morphology. We have constructed a plasmid that encodes for a MT2-Green Fluorescence protein (GFP) fusion protein. The present study examines the effect of changing the length of amino acid linker used to connect the MT2 protein and GFP. Studies show that linker length can affect the chromophore activity of GFP fusion proteins. We have attached the MT2 gene to GFP using a linker that is 2 codons long and a linker that is 4 codons long in separate plasmids. Here we report the localization of MT2 in the fungal cell and chromophore activity of the MT2-GFP protein with the 2-codon linker and the 4-codon linker.

Natural Sciences Posters – Session 2: Biology posters

Frazier Jelke Lobby, beginning at 2:00 pm until 4:00 pm

Session Chair: Mary Miller, Department of Biology

All posters will be available for viewing from 1:00 to 4:00. At least one of the student collaborators will be in attendance and available for discussion from 2:00-4:00 pm. If a specific collaborator is presenting, that coauthor name is underlined.

Complementation of a Calcofluor-hypersensitive mutant in *Aspergillus nidulans*

Emily Backues
Faculty Mentors: Darlene Loprete[1] and Terry Hill[2]
[1]Department of Chemistry
[2]Department of Biology

The cell wall plays important roles in defining cell shape and in mediating the varied interactions between a fungal cell and its environment. It is a dynamic organelle, assembled *in situ* from exported precursors and subject to

developmentally regulated modulation during growth and reproduction. The architectural relationships between the numerous polysaccharides and glycoproteins of the wall are incompletely known, as are the steps by which the complex fabric of the wall is assembled and modified. In a search for as-yet-unidentified genes whose function bears upon cell wall integrity, this laboratory has generated a collection of mutant strains in *Aspergillus nidulans*, which show elevated sensitivity to the cell wall compromising agent Calcofluor White (CFW). CFW-hypersensitivity in one such strain, RCH-44, is complemented by a wild type genomic DNA fragment which contains a single hypothetical gene, AN3460.2 (*A. nidulans* sequenced genome, Broad Institute of MIT and Harvard). The ORF, as identified by automated gene identification software, is 6553 bp in length, with predicted homology to DEAD/DEAH box helicases. Synteny comparisons to comparable regions in fungi and animals suggest that hypothetical gene AN3460.2 has been miscalled and may contain at least two further genes beyond the predicted helicase. We are currently cloning segments of this region in order to identify which component of AN3450.2 is responsible for complementing CFW hypersensitivity in mutant strain RCH-44.

Estimation of carbon sequestration by Overton Park, Memphis, TN

K. Adam Bohnert
Faculty Mentor: Rosanna Cappellato
Department of Biology

Ecosystem services, such as water purification, regulation of climate (carbon dioxide removal), and recreational values, are underappreciated and taken for granted, even though they are critical to the health of our environment. The forest of Overton Park, the largest green space (68.7ha) in Memphis, Tennessee, was chosen to conduct a preliminary study on the extent of carbon sequestration provided by an urban forest. Recently, this project has become even more relevant in view of a proposal by the City of Memphis to lease out or to develop urban green spaces. In this study, four plots (0.04ha) were randomly selected and their tree (dbh>10cm) biomass calculated. The average mass of the four plots is 123.15 Mt/ha, and the total stored carbon of the park is 4,067Mt. At an estimated 5% annual growth, 203Mt/year of carbon is sequestered by the forest of Overton Park. This represents only 0.6% of the total 30,088Mt of carbon emitted by gas and electric usage at Rhodes College during the past year (April 2005-March 2006).

An Assessment of Individual Annual Growth Rate, Spread Rate, and Density of *Asimina triloba* in Overton Park, Memphis, Tennessee.

Christina Campion
Teresa Bell
Faculty Mentor: David Kesler
Department of Biology

Our study took place in Overton Park, a 175 acre old-growth forest in an urban setting (Memphis, TN). Once a rare tree species in the park, *Asimina triloba* (pawpaw), has risen in the past 30 years to become the most important tree in the forest (importance value of 57.8). Using increment cores, tree size (measured as diameter at breast height (DBH)) was related to age by $y = -0.0003x^3 + 0.0209x^2 + 0.2517x$ ($n=47$; $R^2=0.97$) or a diameter growth rate of 0.59 cm/year. This is the first survey documenting an age-size relationship for *A. triloba* of which we are aware. Data from four transects in different areas of the Park revealed a patch spread rate of 2.6 ($\pm$0.96 s.e.) meters per year ($n=4$) and a density of 4300 ($\pm$2100 s.e.) stems per ha ($n=5$). It is well-documented that *A. triloba* does not have a high fruit set, but that it can produce clonally. Future research will focus on the genetic similarity of stems within and among patches.

Characterization of the *MCS9* Suppressor of Mis-localized G1 Cyclin Cln3 in *Saccharomyces cerevisiae*

Rebecca E. Cook
Katherine L. Jameson ‘06
Faculty Mentor: Mary E. Miller
Department of Biology

The cell division cycle is a series of regulated steps during which a cell grows, duplicates and divides into two identical daughter cells. This cycle is regulated by a number of proteins including cyclin dependant kinases (Cdks) and the cyclins which bind to the Cdk, determining the function and location of the complex. Cln3/Cdc28 is a

Cyclin/Cdk complex whose function is to trigger the transcription of genes associated with the G1 phase of the cell cycle and required for DNA replication. Some cancer studies have suggested that a mutation in the functional homolog of Cln3 mammalian cells causes a loss of cell cycle regulation and contributes to tumor growth. Cln3/Cdc28 must be located in the nucleus in order to trigger transcription. We are working with a Cln3 mutant which forces all Cln3 to localize in the cytoplasm. Cytoplasmic Cln3 is unable to support cell cycle progression, leading to cell death. We have since shown that the inability of cytoplamsic Cln3 to support viability can be suppressed by high copy expression of various cyclin proteins. In addition to cyclin-dependent suppression, we have observed suppression by two library plasmids containing unknown suppressors. Our study focuses on the analysis of one of these suppressors, MCS9. MCS9 demonstrates weak but notable suppression of the mislocalized, cytoplasmic Cln3 phenotype. We are currently attempting to identify the specific gene responsible for the suppressing phenotype.

Natural Rarity and Ouachita Hardwoods: *Acer Leucoderme* along the Cossatot River and its Tributaries

Tara Daniel
Daniel Price
Amy Ross
Faculty Mentor: Rosanna Cappellato
Department of Biology

Acer leucoderme, the chalk-bark maple, is known to be one of the rarest maple species in North America. The northernmost boundary of its distribution encompasses a seven-county 'island' population in Northwest Arkansas. Given a striking lack of primary literature relating to this species and that its rare status is connected to the lack of distributional data, the authors constructed an experimental design to map the distribution of *Acer leucoderme* around the Cossatot River and two of its tributaries. By sampling high-impact and low-impact sites with varied altitude, soil composition, and concurrent vegetation, factors that affect distribution were identified. GIS revealed significantly more *Acer leucodermia* in our high-impact site. They appeared to benefit from moderately disturbed, rocky soil and moderate light levels. Disturbance from camping and four-wheeling activities increased the light level further into the forest, aiding the spread of *Acer leucoderme*. Other noteworthy factors included youth-weighted colonization subpopulations in rocky hillside glades away from the river. To a limited extent, our samples of *Acer leucodermia* in the Ouachitas appeared to be segments of slow-growing populations despite significant upstream water pollution and watershed clearcutting. As long as the streamside habitats continue to be conserved, the density and distribution of *Acer leucoderme* make its survival quite likely.

Generation of a recombinant murine herpesvirus (MHV) containing the Epstein-Barr virus interleukin 10 gene driven by the MHV gp150 promoter

Meghan Davis
Faculty members: Gary Lindquester
Department of Biology

Epstein-Barr virus (EBV) is the cause of infectious mononucleosis in humans and has been linked to various forms of cancer. Murine gamma-herpesvirus (MHV) is similar both genetically and pathogenically to EBV. MHV infects mice, which makes it a model system for EBV. A gene called viral interleukin-10 (vIL-10) is carried by EBV but not by MHV. IL-10 plays a role in the suppression of the immune system. Therefore, a strain of MHV was introduced to the EBV vIL-10 gene. The aim of this experiment is to create a recombinant that contains a vIL-10 gene driven by the MHV gp150 gene promoter. The products of this co-transfection were screened using limiting dilutions and PCR. The final goal of this experiment is to create a purified stock of virus that will need to undergo further genetic analysis.

The role of NIL-16 in long term potentiation formation in the CA1 and CA3 synapses of the mouse hippocampus

Gaines Fricke
Faculty Mentor: Jay Blundon
Department of Biology

Interleukin-16 (IL-16) is a cytokine shown to have its effects in the immune system. Recently a neuronal form of IL-16, NIL-16, has been identified in the mammalian CNS. *In situ* hybridization analysis has shown that NIL-16 is strictly localized in the cerebellum and hippocampus, two areas of the brain known for their role in memory and learning. Thus, it is possible that NIL-16 plays an intrinsic role in memory formation. This study sought to determine if NIL-16 had any effect on long term potentiation (LTP) formation in the mouse hippocampus, as it has long been established that LTP is the physiological process resulting in short term memory formation. Field potential recordings in the CA1 region of the hippocampus after 3 trains of high frequency stimuli showed that there was no significant difference in LTP between wild type and IL-16 knockout mice. Hybridization analysis shows however, that IL-16 is most concentrated in the CA3 region. Field potential recordings in this region showed that there was indeed formation of LTP in wild-type mice. This LTP was of similar amplitude, but did not last as long as in the CA1 region. Due to the concentration of NIL-16 in the CA3 region, study of LTP in this area using IL-16 knockout mice may show provide insight into the role of NIL-16 in short term memory formation.

Understanding the Molecular basis of Pneumococcal Adhesion, invasion and mechanisms of pathogenesis in humans

Ross W. Hilliard[1, 2]
Faculty Mentor: Richard W. Kriwacki[2]
[1]Department of Biology, Rhodes College
[2]Department of Structural Biology, St Jude Children's Research Hospital, Memphis, TN

Streptococcus pneumoniae (pneumococcus) remains a significant health threat worldwide, especially to the young and old. While some of the biomolecules involved in pneumococcal pathogenesis are known and understood in mechanistic terms, little is known about the molecular details of bacterium/host interactions. Our work is focused on understanding how the major adhesin, Choline Binding Protein A (CbpA), binds to and causes pneumococcal invasion of human cells. Here we report the results of experiments aimed at understanding the role of CbpA in bacterial adhesion and invasion. Previous studies have provided detailed insights into structure/function relationships for the R domains which are highly conserved in CbpA sequences from many pneumococcal strains. The N-terminal domain of most CbpA variants exhibits helical characteristics on the basis of bioinformatics and experimental results. However, the role of these helical domains in bacterial pathogenesis is not yet understood. Here we report the results of structural and functional analysis of the N-terminal CbpA domain from the TIGR4 strain of *S. pneumoniae*. In addition, we will report the result of bioinformatics analysis of the N-terminal domains of other bacterial strains providing broader insights into their roles in pathogenesis.

An Urban Greenspace initiative in the Hollywood-Springdale Community

Kate Key
Faculty mentor: Rosanna Cappellato
Department of Biology

Up until the mid-1980s, Velsicol Chemical Corporation dumped substantial amounts of chemical by-products into the nearby Cypress Creek. Due to soil contamination near the streambed, several sizable tracts of land have remained undeveloped since it is no longer safe to build on them. These vacant lots have been poorly maintained and have become sites of illegal dumping. Our primary mission is to convert these lots into clean, safe, and aesthetically-pleasing greenspaces providing ecological and social benefits to the community. In Fall 2005, over 12 acres of contiguous vacant land were identified as a potential site for an urban greenspace project. After consultations with Habitat for Humanity, VECA, the Rhodes Hollywood Springdale Partnership, and Memphis Public Works Division, a non-profit organization, Hollywood Greenspace Community (HGC), was established. As part of this ongoing initiative, a group of residents were surveyed about the function and desirability of greenspaces

in their community. Also, the trees present in the vacant areas were identified and measured to be integrated in an idealized rendering of the future green areas.

Monitoring the Oestrus Cycle of an African Elephant (*Loxodonta africana)* at the Memphis Zoo for the Purpose of Artificial Insemination

Kate Key
Brittany Bostick
Jill McCall
Dr. Andy Kouba, Curator of Conservation and Research, Memphis Zoo
Faculty Mentor: Rosanna Cappellato
Department of Biology

In North America, zoos are working to create a self-sustaining population of African Elephants. Captive breeding programs are important to the conservation of this species to widen the gene pool and to reduce importation rates of wild elephants through culling programs. Captive populations are suffering a decline due to a lack of natural breeding, inadequate calf-rearing, a shortened reproductive span (sometimes due to lack of contact with bulls) and the overall aging of the population. To aid the captive breeding program at the Memphis Zoo in producing a new calf via artificial insemination, non-invasive endocrine monitoring is being conducted on the zoo's reproductively viable African elephant. This is being accomplished by assaying the elephant's daily luteinizing hormone (LH) and progesterone levels. The primary goal of this project is to create a hormone profile that can be used to successfully determine the second LH peak, signifying the elephant's ovulation and the optimal time to perform artificial insemination. The data collected is also compared to three attempts to artificially inseminate this elephant that failed.

A novel polarity mutant in the filamentous fungus *Aspergillus nidulans*

Sarah Mercer
Faculty Mentors: Terry Hill[1] and Darlene Loprete[2]
[1]Department of Biology
[2]Department of Chemistry

Growth of filamentous fungi is marked by a degree of cell polarity not shown in yeasts. Initial polarity is established during the late stages of spore germination when, after an initial phase of isotropic spore swelling with uniform cell wall deposition, all subsequent growth and wall deposition is focused upon a single spot, the forming germ tube. The apex of the germ tube matures into the permanently polarized hyphal tip. In a search for novel genes affecting morphogenesis in filamentous fungi, we have used NQO mutagenesis to produce a collection of mutants in *Aspergillus nidulans*, which show various defects in spore and germling development. One of these mutants, RCH-67, exhibits a temperature-sensitive inability to establish a point of permanent polar growth, forming instead a number of self-limiting blastic protrusions at several points upon the swollen spore surface. Growth at permissive temperature is essentially wild type. Using a plasmid genomic DNA library ("AMA NotI", Osherov and May, 2000, Genetics 155: 647-656), we have cloned two genomic DNA fragments, each of which fully complements the defective phenotype of the RCH-67 mutation. The two fragments contain no sequences in common. Comparison to the sequenced *A. nidulans* genome (Broad Institute of MIT and Harvard) indicates the presence of three auto-called genes in one genomic fragment and two in the other. We are currently cloning individually each of the five distinctive genes in order to identify which gene in each fragment is responsible for complementation. Mitotic mapping (parasexuality) and meiotic mapping using strains with chromosome-specific markers is underway to establish the chromosome location of the RCH-67 mutation, in order to demonstrate which of these inserts contains the locus mutated in RCH-67 and which contains a multi-copy suppressor.

Genetic Characterization of Cell Wall Defects in Four Mutant Strains of *Aspergillus nidulans*

Crystal Phelps
Claire Litherland
Faculty Mentor: Terry Hill
Department of Biology

Fungi are important because they play many roles in the world around us, from positive roles as decomposers to negative pathogens. Fungal cell walls are worth studying because they are unique to fungal cells and therefore can be important in many ways, including treating pathogens. The cell wall helps to limit osmotic swelling and maintains the shape of the cell. We are studying fungal cell wall integrity by looking for mutants in the model fungus *Aspergillus nidulans*, which show hypersensitivity to the wall-compromising agent Calcofluor White (CFW). We are also interested in mutants that have additional morphological aberrations such as hyphal swelling. We have selected four mutants for study and have performed genetic crosses between each mutant strain and strain GR5, whose cell wall metabolism is phenotypically normal. In each of the four cases studied, the mutant phenotype assorts in the manner expected if the phenotype is governed by a single gene locus. We have selected progeny strains which combine the individual mutant phenotypes with the characteristic nutritional and spore color phenotype of strain GR5, in preparation for later molecular genetic work to identify the genes responsible for each mutant's cell wall aberration.

Do Freshwater Mussels form a Single Growth Ring every Year?

William Sheftall
Faculty Mentor: David Kesler
Department of Biology

Our objective was to answer the question, "Do freshwater mussels form a single growth ring every year?" While apparently a simple question to answer, previous studies have not rigorously addressed this question. Using Eastern Elliptio (*Elliptio complanata*) shells marked 5-7 years before our study began, we developed criteria for recognizing an annual ring. Shells were thin sectioned and viewed microscopically at 7-40x magnification. If the mussels formed true rings or annuli, we should have observed one ring per year of growth. Our determination of annual rings in the shells differed from the actual number in 28 out of 76 sections (from 46 individuals). On average, we counted 0.11 (± 0.0995 S.E.) rings more than the expected number. We subsequently re-evaluated the 28 sections we had misread and refined our criteria for recognizing true rings. We were able to apply these criteria to all but one shell. We conclude that, using these criteria, the freshwater mussel *E. complanata* does form growth rings annually.

Detection of the Cln3 Protein Expressed from the *CLN3* Promoter Using Bioluminescent Detection Methods in *Saccharomyces cerevisiae*

Michael Spilman
Faculty Mentors: Mary E. Miller
Department of Biology

Cell cycle progression requires a specific set of signals and results in the division of a cell. Initiation of the cell division cycle involves the transcriptional activation of a subset of genes important for DNA replication. This trigger is regulated by the G1 cyclin Cln3 in the budding yeast *Saccharomyces cerevisiae*. Cln3 binds to and activates a cognate serine/threonine kinase called Cdc28. The Cln3/Cdc28 complex works to de-repress G1 transcripts, and this activity absolutely requires the physical association of Cln3 with Cdc28. Analysis of Cln3/Cdc28 complex formation is problematic, since Cln3 is expressed at very low levels in the cell. Co-immunoprecipitation based detection of Cyclin/Cdk interaction frequently requires overexpression of the Cln3 cyclin – at times confusing interpretation of these data.

We find that we are able to detect Cln3 protein expressed from the Cln3 promoter using a bioluminescent assay system. A luciferase tagged version of Cln3 expressed from the CLN3 promoter was introduced into wildtype W303 cells. Rapid incubation of these cells in lysis buffer containing a specific coelenterazine gave detectable and

reproducible luciferase activity, while little to no activity was detected from negative control samples. These data suggest that Cln3 protein is detectable using this system.

Generation of a recombinant murine herpesvirus containing the Epstein-Barr virus interleukin-10 gene driven by the mouse phosphogylcerate kinase (pgk) promoter

Sandra L. Obreza
Faculty Mentor: Dr. Gary Lindquester
Department of Biology

The human Esptein-Barr virus (EBV), an incredibly pervasive human pathogen, is the etiological agent of infectious mononucleosis and is associated with several forms of cancer. The murine gammaherpesvirus (MHV) may provide a viable animal model of EBV infection. Viral interleukin-10 (vIL-10) is a gene unique to EBV, and it is very similar to the host IL-10 gene, which works to suppress cytokine synthesis of T_H1 helper T cells as part of the host's immune response. It is hypothesized that the introduction of the EBV vIL-10 gene to MHV-76, a MHV variant that has lost a subset of its immune evasion genes and has minimal pathogenic effects, will restore the more extensive pathogenic effects of the wild-type virus. The specific aim of this experiment is to generate a recombinant MHV-76 virus using plasmid constructs containing the pgk vIL-10R version of the vIL-10 gene. The products of the co-transfections were screened using a series of limiting dilutions and PCR analysis. The purified viral stock will require further genetic analysis to test the vIL-10 recombinant virus' ability to infect in vivo and to characterize its pathogenic properties.

Social Sciences Oral Presentations – Session 1
102 Clough, beginning at 10:30 am until 1:00 pm

Theme: Cultural Scenes: At home and abroad

Session Chair: J. Peter Ekstrom, Chair, Department of Anthropology/Sociology

10:30-10:50 **Lessons in Financial Planning: Reconsidering the Cultural Scene at a Memphis Soup Kitchen**
Katy Chambers
Faculty Mentor: Susan Kus
Department of Anthropology/Sociology

Sharing and understanding other human experiences of reality allows us to appreciate the many valuable ways of being human and aids in our becoming more complete people. The ethnographer utilizes participant observation methodology in the investigation of different cultural scenes in order to build social relationships in an environment of mutual respect and trust, also providing access to these alternative realities. Recently, I became ethnographer at a Rhodes student run soup kitchen in Memphis. Upon listening, observing, and speaking with a few informants, many stereotypes I had were dispelled. Most importantly, I have learned their lifestyle is one most of us know little about, whether we think we do or not. Certain stereotypes are assigned to soup kitchen attendants and "homeless" people that deserve serious reconsideration. The main priority of this ethnography is to help us appreciate the naiveté of our assumptions about this different lifestyle by exploring how some people negotiate their lives in terms of the resources they *do* have instead of what they do not have.

10:50-11:10 ***byt hezky/ to be pretty:*** **Obsession with Perfection in the New Czech Consumerism**
Joel Parsons
Faculty mentor: Katheryn Wright
Buckman Center for International Education

The Czech Republic finds itself now in a period of transition. After decades of totalitarian rule, democracy swept in after 1989's Velvet Revolution and brought with it capitalism, Western corporations and marketing techniques, and an unprecedented demand for consumer goods – the New Czech Consumerism. This state of transition has profoundly influenced the youngest generation of Czechs, the first ever to be faced with the choice between Avon, Pert, and Herbal Essences, and the first in decades to be encouraged to foster rather than subvert their own individual identities. While studying in the Czech Republic last year I sought to create a portrait of this transitional generation. Focusing my attention on my host sister, I captured images from her day-to-day life and what I came to realize was an intense struggle for control over her image. Through my work I came to realize the extent of her generation's newfound obsession with perfection and what it truly takes 'to be pretty' in the New Consumerism.

11:10-11:30 **Her Crown and Glory: A Look into the Culture of an African American Beauty Salon**
Courtney Jones
Faculty Mentor: Susan Kus
Department of Anthropology/Sociology

Social scientists use the ethnographic method to participate in a cultural scene and understand the worldview of the "other," familiarizing the unfamiliar in attempts to explain to the audience within their own cultural context the meanings and customs of the scene. This semester, I immersed myself in an African American beauty salon in Memphis called "God Is Good." In the era of franchise hair

salons such as Super Cuts frequented mostly by whites, the black beauty salon has challenged corporations by remaining small, independent businesses, owned and operated primarily by black women. These successful businesses have been popularized by the blockbuster film "Beauty Shop;" yet this film misses many of the taken-for-granted aspects of this cultural scene. Through participant-observation, I have gained insight into the culture of the "God is Good" salon where customers and stylists have created a community of mutual support and information exchange, and where storytelling plays a central role. Notably, my study shows how the hairstylists at "God Is Good" have shaped their Christian beliefs into an ethical code creating an environment conducive to teamwork as well as their struggle in asserting their professionalism in a culture which sees them as people who only "do hair."

11:30-11:40 ***Break***

11:40-12:00 **Under the Skin: Ethnography of a Tattoo Parlor**

Jessica Lotz
Faculty Mentor: Susan Kus
Department of Anthropology/Sociology

By embedding themselves in unfamiliar cultural scenes, ethnographers have the unique ability to share with their audience a sophisticated understanding of the "Other" as insiders and bring new meaning to the scene and its taken-for-granted aspects as outsiders. I have found this to be true in my own ethnographic research at *Trilogy Tattooing and Body Piercing* over this past semester. No longer "for sailors and ex-cons," tattoos and piercings are constantly growing in popularity and a means of self-expression and an art form for people from all walks of life. Consequently, body artists have established a viable profession which allows them to cultivate and expand their individual creative abilities within a growing community. I have examined the ways in which *Trilogy* is an ideal environment for such cultivation by providing artists with individual creative freedom and a place of communal support in which they can continually challenge themselves in addition to providing safe, friendly service to customers. It is in this way that *Trilogy* has become one of the most successful body art parlors in Memphis and gives new insight and respect to an "alternative" artistic profession.

12:00-12:20 **It's Not What You Do But What You Know: An Ethnography of A Memphis Fire Department**

Nicholas Westbrook
Faculty Mentor: Susan Kus
Department of Anthropology/Sociology

Ethnography, the primary methodology of anthropology, requires individuals to immerse themselves in a culture different from their own where they are able to describe those conditions and events that make another's way of life unique by means of their cultural heritage, customs, and beliefs. This semester, I have engaged in an ethnographic study at a fire station of the Memphis/Shelby County Fire Department. As a society, we tend to view fire fighting as something that is a straightforward, physical occupation. While physical engagement is part of the occupation, many things go on behind the scenes that make this particular field both complex as well as dangerous. Fire fighters have to follow strict methods as well as be strategic in their treatment of certain situations. Working long shifts together in the fire station and at scenes of fires, fire fighters form tight knit bonds that allow them to work effectively as a team. My study offers a contrast to those general stereotypes we hold about fire fighters and provides our society with a broader sense of both the physical and the mental effort required of fire fighters.

12:20-12:40 **The Art of Maori Communication: Korero O Nehera**

Hallie E. Graves
Faculty Mentor: Katheryn Wright
Buckman Center for International Education

The culture of the indigenous people of New Zealand, the Maori, is distinct in many respects. Amazingly, 240 years after English colonization the central tenets of Maori culture have remained the

same and are demonstrated through their communication with one another and with *pakeha*, or European-descendent people. I had the opportunity to interact with Maori on several occasions and take a Maori culture course while studying abroad, and I am fascinated by Maori communication forms. As with most minority populations, the Maori constantly fight prejudices and misperceptions about their culture. Still, Maori have resisted change and have maintained their core values through communication forms. Upon closer inspection of these forms, the Maori are seen for what they really are- a rich, diverse, spiritual culture.

12:40-1:00 **The "Purrfect" Fit: Work, Play and Adoption at a Feline Sanctuary**

Samantha Hurt
Faculty Mentor: Susan Kus
Department of Anthropology/Sociology

In everyday life, we often take for granted the fact that we are immersed in culture. Culture is everywhere, and subcultures abound within our society. The ethnographic method is the challenging task of interpreting a novel cultural context (or even one's own) through active participation and systematic observation. This past semester, I have explored the cultural scene at *The House of Mews*, a local feline sanctuary and adoption agency. By taking the roles of both the volunteer and the visitor, I have learned about the pragmatic and social dimensions of running a cat adoption agency and the different ways in which the senses are engaged through work, arrangement of the space and playing with the cats. That the adoption agency is unique is almost immediately perceptible to a casual visitor; what I hope to illumine as an ethnographer is the practical complexity involved in running this nonprofit organization and the ways in which practical, social, and material considerations intertwine in this context. Through this exercise I will be able show some of the ways in which culture is constructed and to suggest that the uniqueness of subcultures is something that points to the nature of culture itself.

Social Sciences Oral Presentations – Session 2

Frazier Jelke A, beginning at 10:30 am until 1:20 pm

Session Chair: Nick McKinney, Department of Economics and Business Administration

10:30-10:50 **Incentives and Constraints in the Location of Homelessness: An Economic Perspective**

P. Evan Volgas
Faculty Mentors: Teresa. Beckham Gramm, Patrick Gray, Marshall McMahon and Nick McKinney
Department of Economics and Business Administration

This study revisits earlier studies of homelessness, and argues that their results exhibited omitted variable bias by failing to address the high mobility of the homeless population. Using a more robust measure of homelessness, it refocuses previous studies to determine where homelessness is found and why, as opposed to what causes homelessness. Broadly speaking, the study will answer whether it is constraints or incentives that primarily affect where homelessness is found, as well as whether or not the homeless exhibit rational behavior in their decision of where to live.

10:50-11:10 **Half a Million Reasons to Charge for Printing: An Analysis of Paper Consumption in the Rhodes College Library**

Jacob Cremer
Faculty Mentor: Nick McKinney
Department of Economics and Business Administration

Libraries noticed early that the digital heralded no "paperless office" but instead increasing paper demand. Patrons wanted hard copies for personal use. Free printing meant users had no incentive to

control waste or overexploitation because they paid for paper indirectly - with the academic library, through tuition. Economic inefficiency resulted as users treated paper as a non-scarce resource. In response, the Rhodes College library implemented a printing control program. This program has been an unequivocal success, reducing system inefficiency while providing a probable incremental benefit of $30,000 per year. It promotes environmental awareness and encourages student responsibility through the real-world skill of personally managing a scarce resource. The program has flaws, however, especially in its allocation of non-transferable property rights. A paper market or a new allocation structure could increase efficiency and equity. To study how students consume paper, a multiple regression model was created to test whether independent variables such as academic achievement, financial status, or biographical factors influence total pages printed. Variables found to be significant include RSG membership, enrollment in courses of some subjects, and class status.

11:10-11:30 **The Third World in America: Why the Delta and Appalachian Regions Remain Trapped in Poverty**

Katharine E. Ackerman
Faculty Mentors: Teresa Beckham Gramm, Marshall Gramm and Nick McKinney
Department of Economics and Business Administration

The presence of persistent poverty in the Mississippi Delta and Appalachian regions is well documented by professionals in a variety of fields. This study focuses on what factors contribute to these areas remaining regional poverty traps while the apparently similar counties around them see substantially higher incomes and a higher quality of life. Using a three-stage least squared regression model to analyze a county-level data set assembled from Census 2000, agricultural reports, and various other sources, this analysis demonstrates that the Delta and Appalachian counties' low per capita incomes exist and persist because of a complex interaction of variables and patterns. As may be expected, preliminary results indicate that while there are significant differences in what is influencing each region's low income levels, there are some overarching variables that remain significant across the regions. In general, per capita income levels tend to increase with higher educational attainment and greater population density. Income levels are most negatively impacted by having a higher percentage of single parent households. Other factors that possibly play significant roles are labor force variables, social variables, the economic dependence of the county, and the level of federal funding received.

11:30-11:50 **Factors of Ticket Price: A Study of Airline Prices to and From Memphis**

Rachel Hays
Faculty Mentor: Nick McKinney
Department of Economics and Business Administration

This paper looks at the various factors in determining the price of plane ticket. Specifically, it uses data from eight flights to and from Memphis comparing Northwest Airlines to the airline which has a hub in the destination airport. The variables which should affect airline price are the distance of the flight, the total length of the trip as well as layover time, number of stops and how far in advance the ticket is purchased. Additionally, the paper explores the idea that a low cost carrier such as Airtran adds to competition and affects the ticket price in general for other airlines.

11:50-12:00 ***Break***

12:00-12:20 **A Regression Analysis of the Factors Contributing to Births among San Antonio Teenagers**

Thomas Hook
Faculty Mentor: Nick McKinney
Department of Economics and Business Administration

National data supports that teen pregnancy rates have decreased over the last decade; however, pregnancy rates among San Antonio teens have not followed the same trends. Adolescent pregnancy

rates in San Antonio remain well above the national average and have declined at a slower rate. The purpose of this paper is to determine the factors that contribute to teen births in San Antonio. Teen pregnancy data is taken from the San Antonio Metropolitan Health Department (SAMHD). The paper examines a regression model to determine the contributing factors that lead to teen births in San Antonio. The estimates from the regression indicate that education, employment, and government aid are all associated with teenage childbirth. The significance and magnitude of these factors vary depending on the age of the mother.

12:20-12:40 **Class Demand at Rhodes College**

Paul Lewis
Faculty Mentor: Nick McKinney
Department: Economics and Business Administration

Using data provided by the Office of the Registrar and the Rhodes College Course Catalogues, this paper investigates factors that influence student demand for classes. Demand for a class has been defined as the number of primary enrollment requests divided by the maximum enrollment, and preliminary regression analysis has indicated that there are numerous significant variables. Specifically, it has been determined that departmental GPA, professor rank, class time, day of the week, and the number of sections offered all have a significant affect on the demand for a class.

12:40-1:00 **Rethinking the Impact of Natural Disasters: An Analysis of the Economic Implications of Calamitous Events on State Economies**

Philip Ruppel
Faculty Mentor: Nick McKinney
Department of Economics and Business Administration

With the recent devastation form hurricanes, many Americans have seen the destruction of physical and human capital either first hand or through media sources. With such drastic damage, the question arises of how long an economy will be displaced due to a natural disaster shock. This paper's analysis utilizes cross-sectional and auto-regressive (AR1) time series modeling to examine the impact of natural disasters on annual U.S. State economies, as measured by Gross State Product per capita (GSPpc). The models will attempt to include recent natural disaster, economic, social, and political factors to analyze the effects of different variables on state economies. The paper's goal is to provide an updated analysis of the economic implications of natural disasters for developed countries and attempt to isolate the driving factors of a developed state's economy. After analysis, the results have shown that inducing a natural disaster shock on a state economy usually is not statistically significant. Therefore, natural disasters in general do not have any effects unless they are specifically forest fires, which will have a negative effect on GSPpc. These results would be extremely beneficial in determining the efficient allocation of resources in the rebuilding process after a natural disaster.

1:00-1:20 **The Relationship between Client Importance and Auditor Independence: A Closer Look into Local Markets**

Patrick Crouch
Faculty Mentors: Guy McClain and Nick McKinney
Department of Economics and Business Administration

Auditor independence is said to be compromised as client importance increases. Previous studies have investigated this theory by investigating the association between abnormal accruals and ratios of audit fees divided by non-audit fees (Frankel et al,2002 and Ashbaugh et al, 2003) and/or audit fees and non-audit fees divided by surrogates for audit firm and local office revenues (Chung et al 2003). These studies, however, ignore local market competition and client importance within the local market. Using a sample of 116 public firms from the Atlanta market, I investigate the relationship between audit fees divided by total market audit fees and abnormal accruals. I find results consistent with the underlying premise that local market client importance is associated with decreases in auditor independence as evidence by the positive association with abnormal accruals.

Social Sciences Oral Presentations – Session 3
302 Clough, beginning at 10:30 am until 1:00 pm

Session Chair: Michael Kirby, Urban Studies Program

10:30-10:50 **Environmental Image Study of Rhodes and Memphis**

Andrea Durham
Faculty Mentor: Michael Kirby
Urban Studies Program

Rhodes College is a premier liberal arts college. Unlike other liberal arts colleges, Rhodes is located in an urban setting while other schools of this type are located in rural areas or small towns What this study particularly examines is how students see their homogeneously white educational environment (Rhodes College) versus the diverse, black urban environment (Memphis) in which Rhodes is set.

Three phases of surveys will be distributed to first year and fourth/fifth year students. Each survey will measure similar perceptions but on a different level and in a different way. The first phase will be an oral survey. The second phase will be a written survey. The third phase will be a semi-structured interview. All phases will target first and fourth year students.

This study is expected to find that more negative images and perceptions are associated with the Memphis area, while more positive images and perceptions are associated with Rhodes College. There will be limitations to the amount and type of interactions between Rhodes students and Memphis, TN. The responses will be influenced by the amount of time spent in each environment and the experiences had in each environment.

10:50-11:10 **Presbyterian Churches and Community Involvement**

Anna Ivey
Faculty Mentor: Michael Kirby
Urban Studies Program

Churches in urban areas are often identified with performing various types of outreach to their immediate communities, and Presbyterian churches in Memphis are no exception. By examining the community involvement of three Presbyterian churches in three geographically different areas of Memphis—downtown, mid-town and suburban—, the researcher seek to determine to what extent and in what ways the churches support these programs. The study will show that churches further away from the inner-city will consider their outreach to be more like mission work, displacing the church members to areas that are perceived as troubled or helpless. This is in contrast to more inner-city churches that perform service in their direct community. This distinction implies that churches both in and away from the inner-city are seeking to serve the same demographic in their community outreach. The only real distinction is the coincidence of the church's location, either in the city or in the suburbs.

11:10-11:30 **Getting the Fish to See the Water: Raising Awareness of White Privilege**
Honors Psychology Paper

Emily Clark
Faculty Mentors: Chris Wetzel[1], Anita Davis[1] and Carla Shirley[2]
Departments of Psychology[1] and Anthropology/Sociology[2]

Because of the underlying privileges that whites receive due their race (i.e. better schooling, faster job promotion, better medical treatment and treatment from the criminal justice system, etc.), examining race privilege in the United States is crucial to understanding and ending the inequalities ingrained in modern day society. The present study investigated the impact of a board game designed to educate Whites about their privilege. The board game was developed from an examination of the psychological and sociological studies on privilege, legal records, statistics from governmental research, and demographic data. The results demonstrated that the board game did help make Whites more aware of their privilege, and it motivated them to support affirmative action programs.

11:30-11:40 ***Break***

11:40-12:00 **Storefront Churches: Community Organizations?**

Becky Saleska
Faculty Mentor: Michael Kirby
Urban Studies Program

Storefront churches — churches established in non-traditional, formally abandoned homes and/or businesses — are located in lower-income communities at disproportionately high rates. Although little is known about storefront churches, research suggests that such churches serve as a place of belonging for individuals who have been economically and socially isolated from mainstream society. In the Hollywood-Springdale area, no less than fifteen such churches exist. The purpose of this project is to determine the relationship between storefront churches and Hollywood-Springdale with the hopes laying a foundation for future collaboration with RHSP. In order to initiate contact with storefront ministers, the researcher will attend local storefront services. The researcher hopes to follow-up with storefront ministers and collect relevant data through one-on-one interviews. The membership of storefront churches in Hollywood-Springdale will likely be comprised of local residents. Storefront church services are likely to be highly fundamentalist in practice. Finally, ministers of storefront churches in Hollywood Springdale are likely to be from the area and educated at the same level as the members of their congregations.

12:00-12:20 **Increasing Student Participation in Preventative Health Screenings in Memphis**

Mary Landon Downs
Faculty Mentor: Thomas McGowan
Department of Anthropology/Sociology

Due to gaps in health services, there is a need to provide community-based, preventive health care to inner-city youth in Memphis. Health screenings such as physicals, hearing examinations, vision tests, and dental screenings and health forums on nutrition, prenatal care, and safe sex are effective in identifying unmet care needs and reducing the onset of both acute and chronic diseases. Memphis health professionals have offered such programs to schools for free, but student participation is quite low. For example, at Cypress Middle School, approximately 25% of the students participated in free annual physicals in 2005. According to officials at Cypress, participation was limited by the low number of completed parental consent forms that were required for students to participate in the free screenings. This research project presents findings from a review of "best practices" regarding parental involvement in educational settings, including strategies to secure parental consent for student participation in extra-curricular programs. Recommendations for action based on the review of best practices are presented in support of the effort to increase student involvement in health screenings at Cypress Middle School by increasing the completion of parental consent forms submitted by students in 2006.

12:20-12:40 **Effective Policies Targeting Lead Based Paint Poisoning in the United States**

Austin Horne
Patti Mahautmr
Christy Simecka
Faculty Mentor: Thomas McGowan
Department of Anthropology/Sociology

Lead-based paint poisoning is one of the most pressing issues concerning older communities and specifically minority neighborhoods today. Significant lead intake due to inhalation of dust from paint or other lead-based substances causes serious health issues in children under the age of 12 including cognitive development inhibition and other learning disabilities. All homes built before 1978 have some risk of lead based paint. Certain demographic groups have an increased risk of living in these types of environments – African-Americans are most at risk, especially in inner-cities. A number of

governmental policies are currently aiming to combat this problem, with some having much greater success rates than others. Rhodes College is presently partnering with HUD and the City of Memphis to identify children living in at-risk homes in a neighborhood northeast of campus. Our research aims to analyze the health problems associated with lead-based paint poisoning and determine the most effective programs to eliminate this risk.

12:40-1:00 **Public Versus Private Life: People Battling Substance Abuse**

Carrie Osborne
Faculty Mentor: Michael Kirby
Urban Studies Program

Research shows that many substance users create a separation between their drug-related activity and their lives with family, friends, and coworkers. The proposed study will involve interviews with former substance users in order to hear their personal perspectives on this issue. The researcher will interview at least ten Synergy rehabilitation program participants to gain their perspectives and reflections of their relationships during their time of drug use. Interviews will include questions about where substance users live, where they bought or used drugs, their relationships with family and friends while using the substance(s), and whether coworkers were aware of their substance use. A map will be created to chart the geographic separation or interconnectedness between different parts of their lives. Results will most likely show geographic and emotional separation exists in the lives of the Synergy program participants. The study may indicate that substance users residing in middle to high income neighborhoods take part in drug-related activity in lower income areas, while low income users may be more likely to engage in such activity in closer proximity to their own neighborhoods.

Social Sciences Oral Presentations – Session 4
102 Clough, beginning at 1:10 pm until 4:00 pm

Session Chair: Carla Shirley, Department of Anthropology/Sociology

1:10-1:30 **"You Throw Like a Girl." The Gendering of Society and Sports.**

Elizabeth Cummings
Faculty Mentors: Carla Shirley
Department of Anthropology/Sociology

Sports play a big part in today's society. Today there are multiple ways to participate in sports, such as little leagues for children, professional leagues for career athletes, and as spectators of sports. I will show how participation in sports reinforces or even creates gender stereotypes. One societal expectation is that females are supposed to be soft and feminine, which is contradictory to the image of "rugged" athletes. For example, when women started to play baseball the sport was changed to "fit" the image of women and changed to *soft*ball. I maintain that sports are based on and influence the traditional gender expectations of men being "masculine" and aggressive and females being "feminine" and fragile. To examine this cycle, I reviewed the existing research on the connections between sports and gender and I use case examples to investigate these connections. I argue that gender norms are being reinforced in the children and adults of society because sports play a significant role in mainstream culture and that these gender norms can have negative effects on the representation and equality of men and women in other areas of society.

1:30-1:50 **Assessing HIV/AIDS Prevention, Education and Care Needs In Memphis**

Katie Preston
Nick Westbrook
Deena Patel
Faculty Mentor: Thomas McGowan
Department of Anthropology/Sociology

This study reviews and compares existing HIV/AIDS community needs assessments conducted in the United States between 2003 and 2006. Needs assessment reports are reviewed with regard to their 1) data sources and methodologies, 2) target populations and population samples, 3) research findings and 4) recommendations. This information is then used to contextualize and inform the research design of the 2006 Southwest Tennessee HIV/AIDS Care Consortium's Needs Assessment. Preliminary data from one component of the Consortium's needs assessment, an interview survey administered to a random sample of People Living With HIV/AIDS (PLWHA), are presented and compared to findings reported in different areas of the country.

1:50-2:10 **Building Community Trust In Support of Research to Identify Barriers to Prenatal Care**

Britt Merritt
Kelly Brier San Miguel
Hilary Mast
Ambreen Mardhani
Morgan Reed
Faculty Mentor: Thomas McGowan
Department of Anthropology/Sociology

Infant mortality in the Hollywood Springdale area is among the highest in the United States and compares unfavorably with infant mortality rates in many developing nations. Low birth weight and premature births are the primary predictors of infant mortality, and low birth weight and prematurity are largely the result of a lack of prenatal care. Increasing prenatal care among women is thus an important component of community strategies to reduce infant mortality.

The purpose of this study is to build relationships and trust with children and women in the Hollywood/Springdale community in order to recruit interview subjects to examine the factors that limit access to prenatal care. Relationship building strategies are discussed and observations relevant to health care needs and access are presented. Identified needs among children include life skills training related to issues of self-confidence, health and sexual education. Outcomes regarding the effort to recruit women to participate in interviews concerning barriers to prenatal care are presented.

2:10-2:30 **What is Hospice? A Modern Day Care Movement**

Stephanie Goldstein
Faculty Mentor: Carla Shirley
Department of Anthropology/Sociology

The first hospice was established in the United States in 1974 in New Haven, Connecticut. In 1985, Methodist Alliance Hospice was founded in Memphis, Tennessee. The purpose of this study is to explore the modern hospice movement in Memphis and learn about the present day advances and concerns within this local palliative care foundation. Hospice care seems to be one of the aspects of healthcare that society knows about the least. Many people do not know that hospice care is covered under Medicare and are not aware of the functions of hospice. For example, people can use hospice care when they are diagnosed with six months or less to live, and the main goal of the care is to control pain enough that people have quality of life until the time of death. To learn about hospice care in Memphis, I researched its history and development within the city, and I conducted in-depth interviews with administrators, primary caregivers, and volunteers at Methodist Alliance Hospice. Through these interviews, I explored how hospice affects their daily lives and investigated any changes or goals they have for the future success of hospice in the city.

2:30-2:40 ***Break***

2:40-3:00 **The Power of Media Representations: The Generalization and Vilification of "Arabs."**

Hazami Barmada
Faculty Mentor: Carla Shirley
Department of Anthropology/Sociology

An aspect of the backlash facing the Arab-American and Muslim communities in the wake of the September 11 attacks is the increased defamatory representation and vilification of Arabs, Arab culture and Islam in media outlets. The media furthers the establishment of Arabs and Muslims as the common "enemy" to the Western Hemisphere; marginalization and frequent misconception of the "othered" communities is created, perpetuated and ingrained in our ideologies, in part, through mass media, namely the News. In essence, in the media, all people of *perceived* Arab origin, regardless of geography, citizenship, religious affiliation and political views, are lumped into the group of "Anti-American" and "potential terrorists." Through content analysis of The New York Times and the Wall Street Journal depictions of "Arabs" and "Muslims" pre and post September 11, 2001, I analyze how descriptive words such as "terrorist" are used in the media, the ways in which they are used, the frequency of their use and who is implied by these covert associations. I further analyze the correlation between media portrayals and hate crimes inflicted upon Arab/Muslims, both significantly higher post 9/11. Negative associations of "Arabs" and "Muslims" generate misunderstanding, prejudice, discrimination and racism, placing constraints on the "free" way of American life.

3:00-3:20 **International Adoption in the United States: How Do Parents Address Cultural Differences Within Their Family?**

Julia Dobbins
Faculty Mentor: Carla Shirley
Department of Anthropology/Sociology

Adoption has served as an outlet for many hopeful parents within the United States. While domestic adoption remains prevalent, more and more couples and individuals are choosing to adopt children internationally. Due to its increased popularity hundreds of adoption agencies nation wide now cater to individuals seeking to adopt abroad. The growing number of parents adopting internationally has led to a concern regarding the social and cultural implications of these adoptions. Most children adopted internationally are done so by parents of a different race and culture. A great deal of attention is being given to children adopted internationally and their crisis of identity. Instead of focusing on the child, this research project centers on adoptive parents and their approach to transcultural parenting. The research conducted within this project center around why people choose to adopt internationally and how or if they address the racial and cultural differences that exist within their family. I examine existing research, current policies, and program guidelines for U.S. parents who wish to adopt internationally. In response to the growing diversity of nationalities with the United States as a result of international adoption, this project seeks to better understand the implications of this integration for the child, the parents, and the larger community.

3:20-3:40 **Deconstructing and Demystifying the Gender Binary: Local Transgender Identity and Community Formation**.

Chellie Bowman
Faculty Mentor: Carla Shirley
Department of Anthropology/Sociology

Within queer theory, increasing attention to transgenderism seems to stem from an intense interest in "trans" deviation and digression from the "natural" two sex system. Transgenderism often presents identities that are indecipherable to society and that breach its gender norms. Society is unable to interpret or understand identities outside of its mutually exclusive categories, where presumably sex,

gender, and sexual preference "match up". The purpose of my study is to gain an understanding of identity and community formation of local transgendered peoples. In doing so, I will examine the so-called paradox that transpeople are said to embody by merely switching gender roles and thus reifying the gender binary. To investigate these processes, I conducted in-depth interviews with people involved in the Memphis transgendered community. The interviews explored transpeoples' experiences, including those of "coming out", daily life and interactions, transphobic incidents, and obstacles confronted in constructing a transgendered life. In particular, this study asks "Do transpeople challenge or reinforce the gender binary?", arguing that the heterogeneity and complexity among transpeople in the construction of their identity and the communities in which they participate can allow for a radical challenge to and departure from the restrictive two sex binary.

3:40-4:00 **"Who's the Fairest of Them All?": Media and Body Image**

Cameron Rochelle
Faculty Mentor: Carla Shirley
Department of Anthropology/Sociology

On an average day, people are exposed to thousands of media images that they are not consciously aware of viewing. Mass media is used to represent the ideals of our culture, including body image and attractiveness. Individuals base their own level of attractiveness on what others in society think and value, as seen by the individual through media images. They judge their own beauty on what others consider beauty to be. To explore this relationship, I conducted a study involving showing Rhodes students media images and surveying their evaluation of these images and their own body image. Because there is no one body type and no perfect body type, considering through air brushing the celebrities behind these images do not even have the perfect bodies they portray, there are many negative consequences of always comparing oneself to these unreachable images. Diseases such as anorexia and bulimia have become a major problem among youths and adults, both male and female. Cosmetic surgery is a booming industry mostly due to the media. The search for beauty has become an unhealthy obsession for most of the American public and I believe for the most part because of American media today.

Social Sciences Oral Presentations – Session 5
302 Clough, beginning at 1:10 pm until 4:20 pm

Session Chair: Bette Ackerman, Department of Psychology

1:10-1:30 **A Living Wage: Why We Need It and How We Get It**

P. Ashley Mitchem
Faculty Mentor: Carla Shirley
Department of Anthropology/Sociology

Minimum wage in the city of Memphis is $5.15. This wage amount does not provide enough funds to meet basic living needs of an individual to support their family. A viable option to reduce the poverty level in Memphis is the living wage: the wage necessary for a family to serve its basic needs excluding the cost of recreation activities. The three-year-old Memphis living wage campaign has made little progress due to resistance from local business and government. The Rhodes community has the ability to step in and aid this campaign as a leader in the Memphis community. Rhodes College prides itself on service: we run a soup kitchen, adopt friends from Snowden Elementary, and build houses with Habitat for Humanity. While these activities are important to our community, should we not work to end the cycle of poverty that traps those we serve? To address this question, I analyzed living wage literature, existing research on the living wage, and the campaigns at four other colleges and universities. This project serves to inform the Rhodes community as to the importance of the living wage, why the Rhodes community should be involved, and the best practices for our involvement in light of campaigns at these other colleges and universities.

1:30-1:50 **Implications of Radiation Therapy on Memory in Craniopharyngioma Patients**

Gena Dolson[1]
Thomas Merchant[2]
Faculty Mentor: Steven Lloyd[1]
Department of Radiation Oncology, St Jude Children's Research Hospital[2];
Department of Psychology, Rhodes College[1]

Craniopharyngioma is a rapidly metastasizing tumor that accounts for 10% of pediatric tumors. Although it initially develops in the supersellar region near the pituitary gland and hypothalamus, it typically invades the cerebral ventricles and progresses to a number of brain areas including the frontal lobes. The most effective and standard treatment for this tumor involves radiation therapy, which can be deleterious to the neuronal tissues contained in or around the target areas or radiation trajectories. The impact of radiation on frontal lobe damage is integral in understanding the possible memory deficits produced by craniopharyngioma treatment, since this region is thought to house executive functions, including a number of memory processes. MRI scans of consenting pediatric patients being treated at St. Jude Children's Research Hospital for craniopharyngioma were analyzed to determine the amount and specific strength of radiation received by each patient. Memory scores from The California Verbal Learning Test (child version) were compiled for five years of treatment follow-up and were used to assess the possible effects of radiation on the frontal lobes when compared with linear trends for dose volume at specific strengths. Linear trends were also predicted for possible covariates such as gender, race, hydrocephalus, and surgical class.

1:50-2:10 **Narrative Voice and Social Cognition in Children's Conflict Narratives**

Jenny Hansen
Chrissie Hendrickson
Faculty Mentor: Marsha Walton
Department of Psychology

We examined 690 narratives written by inner-city children in the fourth, fifth, and sixth grades about interpersonal conflict. We consider how the use of various literary features relates to the development of narrative voice, and how voice relates to psychological sophistication in terms of children's notion of self and other. Past research has primarily focused on narrative construction in the context of very young children as they first develop social cognition, or the concept of self and other. Our study will supplement this research by examining more advanced development of social cognition. Also, the concept of narrative voice has not been adequately captured in regards to specific literary devices. We developed a measure of literary voice that considered literary features, a measure of narrative complexity, and a measure of psychological sophistication. We will examine stories rated high and how on literary voice, and we will report quantitative and qualitative analyses of how our assessment of voice relates to the psychological sophistication of the children's stories. Through this research, we hope to determine how the use of particular literary devices contributes to a child's advanced development of social cognition as well as their ability to express their mental states through narrative.

2:10-2:30 **Consumer Behavior and Attitudes in the Narratives of Preschoolers**

Lori Holyfield
Faculty Mentor: Marsha Walton
Department of Psychology

This study examined consumerism in over 400 narratives from two classrooms of children in a Pennsylvania preschool. During the day, these children were allowed to tell the teacher a story whenever they wanted about anything they wished. It is noteworthy, then, that over 100 of the stories talk about consumer behavior. In capitalist modern society, we are all consumers of material goods. The logical question, then, is how do we become consumers? Many studies have examined consumer socialization, as well as consumer attitudes and behavior, in adults, adolescents, and older children. Very few, however, have studied these phenomena in very young children, though consumer

socialization begins far before formal education commences; and fewer still have studied consumer attitudes and behavior in an open-ended way, allowing participants to tell their own stories rather than constraining them into predetermined answer choices. The purpose of the present study was to try to close some of these gaps by asking what types of consumer behavior children choose to discuss in their narratives; what types of items they describe buying, selling, owning, and wanting; and whether there are notable differences in how children of different ages and genders describe consumer attitudes and behavior.

2:30-2:40 ***Break***

2:40-3:00 **Narrative Performance and Creation of Local Culture in Two Preschool Classrooms**

Sandra L. Keller
Faculty Mentor: Marsha Walton
Department of Psychology

The idea of culture plays a central role in much of psychological theory, but the process by which individuals shape and are shaped by culture has been little studied. Using the microcosm of two preschool classrooms, I explored how children create, negotiate, and perpetuate classroom culture through a communal narrative performance activity. Children created stories, cast classmates as characters, and acted stories out together as part of a daily activity. The 449 narratives collected were reliably coded for organization around routine life activities or exceptional events, focus on individual or shared experience and on own and others' internal states, and nature of any violence depicted. Children frequently appropriated features of classmates' stories, adapting them creatively in their own narratives. Recurring motifs such as nurturing behaviors, fantasy elements, or special outings were noted, and a method of representing spread of these motifs was developed. Even though the two classrooms were taught by the same teacher, their narrative cultures differed in interesting ways, including the extent to which violence or ordinary life events were narrativized. The construction of age and gender in each year was also explored. These findings demonstrate the role of creative expression in the development of a cultural milieu in which children negotiate social identities.

3:00-3:20 **Question Asking in Expert Tutoring**

John Moses
William Willson
Lindsey Sears, Lab Assistant
Faculty Mentors: Marsha Walton and Natalie Person
Department of Psychology

Human one-on-one tutoring is considered the most effective teaching technique. The processes by which this method so efficiently accomplishes its task are still little understood. It has also been demonstrated that questions, generated both by the teacher and student in an academic setting, are an important component of learning. Person and Graesser, along with other researchers, have brought about an investigation into the use of questions within the specific learning technique of tutoring, asserting the quality of questions asked to be an essential part of the effectiveness of tutoring. In their studies, they classified questions along several key components such as the specificity of the question asked, the mechanism that motivated the questioner in asking the question, and other important aspects of questioning. However, their work was limited to the study of inexperienced amateur tutors. Our study seeks to use Person and Graesser's method of question categorization and apply it to highly experienced and effective tutors. By doing this, we will demonstrate the specific qualities and categories of questions that most effectively lead to learning within tutoring. We expect these results to add valuable insight into the techniques of effective tutors and to further the research of academic learning processes.

3:20-3:40 **Children's Description, Attitudes and Understanding of Health-Related Events**

Abigail Ray
Faculty Mentor: Marsha Walton
Department of Psychology

How children describe and understand illness and other health-related events is a relatively unexplored area in theoretical and empirical psychological research. Theories on children's perception of health have been weakly supported with empirical evidence. Empirical studies evaluating children's understanding of illness and symptom perception have used supplied-response type questionnaires and interviews. These formats force children to pick an answer that may or may not accurately describe their beliefs. Previous research suggests a need for a change in research methods to include personal narratives as a mode of gaining information about how children describe and understand health. Narrative format allows for open-ended interpretation and elaboration on personal concerns. The current study is a descriptive analysis of a set of children's narratives for instances of health-related events. Out of a set of 346 narratives, 115 narratives were coded as containing health-related events. These health-related stories were coded based on how each child chooses to describe the event in terms of the type of event, who is involved, the attitudes of the child towards the event, and the child's understanding of the event.

3:40-4:00 **Raising Awareness of Gender and Race Privilege Susan Tidball Means Award for Women's Studies**

Emily Clark
Faculty Mentors: Chris Wetzel[1] and Dee Garceau[2]
Departments of Psychology[1] and Women's Studies[2]

This paper investigates the prevalence and effects of gender privilege in light of race privilege issues through a detailed research of previous psychological and sociological studies on this topic, legal records, statistics from governmental research, and demographic data. Because of the underlying privileges that White males receive from their race and gender (i.e. more frequently elected to leadership roles, from more financially stable backgrounds etc.), finding a way to present race and gender privilege in the United States is crucial to gaining the support of (male) whites in ending the inequalities ingrained in modern society through a variety of affirmative action programs. The intersections between race and gender will are investigated to see the similarities and differences in privilege and discrimination for each. This paper is written in the context of additional research on race privilege for honors research in psychology. Using the research from the honors experiment I conducted on race privilege and the data collected in this study, I propose ways to educate people about the existence of subtle forms of gender privilege with hopes of inspiring people to work against it.

4:00-4:20 **Is it a Small World After All?: Globalization of Western Culture**

Ryan Thames
Faculty Mentors: Carla Shirley and J. Peter Ekstrom
Department of Anthropology/Sociology

Globalization, the spread and influence of a dominant culture across international and cultural boundaries, is a topic of concern across many disciplines. In cultural studies, it has often been viewed as a problem that needs to be solved. In the light of Western media and ideas broadcast across the globe, from U.S. magazines and product advertisements to Hollywood celebrities, many fear the homogenizing effects of other cultures bombarded by and identifying with U.S. culture. Some argue that this will lead to decreasing diversity and to the destruction of local cultures and ways of life. My study is a case study analysis directed toward the effects of mass media and other globalized institutions, such as Evangelical groups, on ritual and daily life among two non-western international cultures (the Andean culture of Peru and Ecuador and the North-West Amazonian tribes) and two domestic sub-cultures (the Native American Sioux and Apache). In each case, I will examine the presence of U.S. influence and the culture's varied responses to it. I will address the fears of

homogenization, but also the potential for a culture to adapt to these influences in its own way rather than as a homogenous reflection of the influencing culture.

Social Sciences Oral Presentations – Session 6
Frazier Jelke A, beginning at 1:30 pm until 3:40 pm

Theme: Current Issues and Enduring Debates in International Studies

Session Chair: Amy Risley, Department of International Studies

1:30-1:50 **The Protection of Human Rights in Post-Communist Countries: An Analysis of Poland, Latvia, and Ukraine**
Catherine Birdwell
Faculty Mentor: Amy Risley
Department of International Studies

One aspect of twentieth century politics that greatly affected the international order was the collapse of colonialism and the resulting emergence of newly autonomous states. As the twenty-first century begins, many of these states have been independent for a substantial period of time and have demonstrated remarkably different characteristics in a variety of areas, particularly the area of human rights. I look specifically at Poland, Latvia, and Ukraine, all former members of the Soviet Union and the Eastern bloc, to examine why different human rights situations exist across newly autonomous states. I conclude that this variation is due to several factors: the relationship of the newly autonomous state to the old regime, the adoption of the old regime's political patterns in the new regime, the influence of the regional institutions, and ethnic diversity.

1:50-2:10 **Explaining the Successful Resolution of Intractable Conflicts**
Emily Davis
Faculty Mentor: Amy Risley
Department of International Studies

Studies of international conflict have tended to focus on the reasons why a conflict begins and escalates. Conflicts that have been dubbed "intractable" have been given more attention because of the long-standing rivalries in place that shape these conflicts. Only in the last few decades has considerable research been devoted to the question of *how* resolutions are reached in these conflicts and *why* they are successful at resolving them. This project examines the conditions that must be present for a successful resolution of intractable conflict using a synthesis of realist and liberal theories. Specifically, factors such as power relations, mixed motive formation, cost-benefit analysis, and the construction of a negotiated agreement are analyzed in two cases of intractable conflict: Angola and the Armenian-Azerbaijani conflict.

2:10-2:30 **Post-Colonial Democratic Stability: Analyzing What Matters in Africa**
Scott Douglass
Faculty Mentor: Amy Risley
Department of International Studies

Why has Botswana maintained a high level of democratic stability while Sudan has experienced very low levels of stability and recurrent authoritarian rule? This question should be considered in the context of the following broader question: What are the major factors that contribute to democratic stability in post-colonial states in the developing world? I postulate that the degree of colonial administration and the roles of individual actors in the system are the two most significant factors that contribute to the level of democratic stability. This hypothesis considers the unique circumstances that former colonies face that many other emerging democracies have not faced, such as sudden transitions

to self-government, established civil service infrastructure, pre-colonial indigenous political systems and cultures, ethnic differences, and freedom fighters-turned-politicians.

2:30-2:50 **The Effects of Islam on Democratization**

Casey McElroy
Faculty Mentor: Amy Risley
Department of International Studies

Democratization in Islamic nations is currently a very popular topic in international politics. The world is watching events unfold in Afghanistan and Iraq as the democratization process takes root in the Middle East. There are several arguments about the influence of Islam on the process of democratization: some social scientists claim that Islam is an obstacle; others discredit that notion, suggesting that the dominant religion in a country is less significant. Some also note that countries with large Catholic or other religiously devout populations have become democracies. I argue that Islam has a limited effect on the democratization process in Islamic nations. Examining the nations of Egypt, Indonesia, Saudi Arabia, and Turkey, I use the percentage of the Muslim population, the enforcement of Islamic laws, the social position of women, and GDP to determine whether Islam plays a role in democratization. My research suggests that other factors are influencing the democratization process within Islamic nations.

2:50-3:00 ***Break***

3:00-3:20 **Effective State Responses to Terrorism: Lessons from India, Japan, and the United Kingdom**

Brandon Nugent
Faculty Mentor: Amy Risley
Department of International Studies

Scholars of international relations have spent substantial time and effort attempting to determine what makes for an effective state response to terrorism. This topic has been studied with considerable depth because scholars' findings and world-leaders' perceptions of mechanisms for effective state response to terrorism can radically influence the global political landscape and the balance of power in today's multi-front "war on terror." Some state responses to terrorism have been much more effective than others. What explains this phenomenon? While most scholarly debate rages between competing sides passionately insisting that either wholly military or entirely bureaucratic responses are the most effective, I theorize that the most effective response is one that instead *combines* components of both types. Case studies of India and Japan show that attempting to mitigate the terrorist threat through purely military or bureaucratic responses produces disastrously ineffective results. The case of the United Kingdom, however, demonstrates that a counter-terrorist strategy that combines aspects of both response types results in a much more positive outcome.

3:20-3:40 **Democratic Reform in Authoritarian Countries**

Dane Meyer
Faculty Mentors: Lawrence Hamlet[1], Michael Drompp[2] and John Copper[1]
Departments of International Studies[1] and History[2]

Since the early 1900s, political scientists have sought to explain the causes behind democratic transitions in authoritarian regimes. While their extensive research has proposed multiple explanations, ranging from a country's level of economic development, cultural values, and the role of political actors, there is still little consensus among scholars as to what factors are most relevant. Because of the unresolved nature of the scholarly debate on democratization, as well as the relevance such a debate holds towards current U.S. foreign policy, this project examines the question of what causes democratic reform in non-democratic countries. After first reviewing several of the current arguments for what causes democratization, this project proposes its own alternative theory which builds on existing explanations while adding variables which are traditionally overlooked, such as the

role of domestic public support and the impact of foreign influences on the regime. The cases this project examines include Zimbabwe, Singapore, Poland, Mexico, and Taiwan.

Social Sciences Posters

The Middle Ground, Barret Library, beginning at 12:00 pm until 2:00 pm

Session Chair: Hyun-Jeong Joyce Kim, Department of Psychology

All posters will be available for viewing from 12:00 to 4:00. At least one of the student collaborators will be in attendance and available for discussion from 12:00-2:00 pm. If a specific collaborator is presenting, that coauthor name is underlined.

Business Consumer Survey of the Hollywood Springdale Neighborhood

Ashley Crosland
Faculty Mentor: Michael Kirby
Urban Studies Program

The consumer survey of the Hollywood Springdale neighborhood is gathering information regarding resident's consumer behavior and their desires for businesses in the Hollywood-Springdale area. The survey poses questions about residents' preferences for goods and services, as well as their opinions on the neighborhood commercial districts. Research is being conducted to support the process of business revitalization in the area. Data collection is being distributed through door-to-door surveys, telephone surveys, Rhodes Hollywood Springdale Partnership (RHSP) meetings, and visitors to the Rhodes Hollywood Springdale Partnership Office. The primary data is dependent upon the active residents in the Hollywood Springdale Community Council and other organizations/committees that are related to RHSP.

The study may find that residents are dissatisfied with the goods and services provided within the community. The study may find that residents primarily purchase products outside the neighborhood and use the current neighborhood commercial districts for convenience or necessity rather than having a desire to shop at the local businesses. Residents will state the necessity of a grocery store and a banking institution within the neighborhood.

Building in the Hollywood-Springdale Area

Caroline Fabacher
Faculty Mentor: Michael Kirby
Urban Studies Program

The study examines the homes in the Hollywood-Springdale area provided by Harold Buehler, a low-income developer. Buehler homes are located all throughout Memphis; many in this particular area. Studies confirm that more problems occur with home maintenance in low-income areas; renting to this demographic of people is a challenge and can often prove to fail. Data will be gathered in person by women currently living in Buehler built homes. A GIS map of the Hollywood-Springdale Buehler homes will then illustrate the number of Buehler homes in the area the percentage of those women unsatisfied. Buehler homes are all rented in the Hollywood-Springdale area although Buehler himself likes to eventually have more ownership clients than renters. Most of these women seem to be uneducated about Mr. Buehler and I am expecting to educate them some on the renting process and also why Mr. Buehler has chosen Hollywood-Springdale to build in.

Getting the Lead Out

Justin Guthrie
Faculty Mentors: Michael Kirby[1] and Thomas McGowan[2]
Urban Studies Program[1]; Department of Anthropology/Sociology[2]

The use of lead paints has been illegal since 1978. Yet this problem still affects over 40 million homes in the US. This project focuses on helping to remedy the problem in an area in which Rhodes College is highly invested. There are many houses in Hollywood Springdale with children that have not been tested. This means that these houses could have the potential to cause lead poisoning in children with the parents completely unaware. The data is

collected through a door to door survey. The survey identifies households that have pregnant women or young children under the age of six. It is then turned over to public agencies so that they can test the levels of lead in the blood of the children to determine if lead is an issue that needs to be addressed. Although there are many laws in place that regulate lead paint Hollywood Springdale will have a high rate of houses with lead in them. The children living in these rental homes that are surveyed will have a higher rate of lead poisoning than children not living in homes with lead paint.

The Effects of Musical Tempo & Familiarity Upon Reading Comprehension

Lorrayne Mallott
Megan Benson
Lori Holyfield
Faculty Mentor: Hyun-Jeong Joyce Kim
Department of Psychology

We investigated the effects of listening to classical music differing in tempo and familiarity upon reading comprehension. Subjects, consisting of 47 undergraduates enrolled in introductory psychology classes, signed up to participate in the study. Each of the students read three passages and took a reading comprehension test while either listening to no music, slow familiar music, slow unfamiliar music, fast familiar music, or fast unfamiliar music. The study indicated a significant familiarity by tempo interaction, such that when the music was slow, those listening to familiar music scored higher on the reading comprehension task than those listening to unfamiliar music, but when the music was fast, those who listened to unfamiliar music had higher scores on the reading comprehension test than those listening to familiar music. Therefore, increased arousal caused by listening to familiar music was moderated by the added arousal of fast tempo. This interaction can be explained by the Yerkes- Dodson Law of Arousal in that familiar music produced performance-enhancing levels of arousal only when it was of slow tempo, because the added arousal caused by fast tempo created heightened levels of arousal detrimental to reading comprehension.

Can thought suppression alter the P3a waveform in a 3 stimulus oddball task?

Jeremy Sadkin[1]
Gena Dolson[1, 2]
Faculty Mentor: Robert Strandburg[1]
Departments of Psychology[1] and Biology[2]

One of the most fruitful lines of research in psychophysiology concerns the P300 wave, a measure of the brain's detection of meaningful or unexpected events. There are two interpretations of the earlier, more frontal component of this waveform (the P3a) elicited by rare, task irrelevant stimuli: one theory views the P3a as an index of the orienting response while the other maintains that P3a includes activity associated with the inhibition of further processing. A standard 3-stimulus "oddball" paradigm will be used in which subjects are presented with a frequent, baseline tone and two rare tones (a target and a distractor). Participants will be tasked with keeping track of the number of target tones during each of two identical stimulus sequences. During the second set, participants will be explicitly instructed to suppress thoughts of distractor tones. In addition, while half the participants will be asked to keep track of the same tone that they counted in the first run, the other half will be told to track the previous distractor tone. If P3a includes inhibitory processing, we expect to see increased P3a activity (frontally) to the distractor stimulus and even greater P3a activity among participants with reversed stimuli.

The Effects of Perceived Nutrition and the Presence of Others on Eating

Rebecca Smith
Courtney Lippoff
Faculty Mentor: Hyun-Jeong Joyce Kim
Department of Psychology

The purpose of our study was to determine the effects of the perceived level of healthiness of ice cream and the presence of others on food consumption and anxiety level. 42 undergraduates were recruited from introductory psychology classes. Participants were divided into either single or paired conditions, as well as health-conscious and health-unconscious conditions based on the given nutrition facts of the ice cream. Anxiety levels were measured using two questionnaires that were administered before and the day after the ice cream was consumed. The amount

of ice cream consumed was measured by the first bowl and a second bowl given 5 minutes after the first bowl; amount of future food consumption was measured by a dietary recall given by the participants the following day. Results indicated a significant interaction between the health condition and the presence of others on anxiety, such that participants in the unhealthy/paired condition experienced a higher level of anxiety in comparison to those in the unhealthy/single condition. There were no significant main effects for the amount of food consumed following the experiment, presence of others on the amount of ice cream eaten during the experiment, or of health condition on anxiety level.

Prenatal Care Study

Rebecca Kynes
Faculty Mentor: Michael Kirby
Urban Studies Program

Memphis currently has the highest infant mortality rate in the nation and zip code 38108 stands as the neighborhood with the most critical problem. It has been suggested that prenatal care is responsible for significantly reducing the infant mortality rate. However, Memphis ranks 49th out of 50 cities in the percentage of women not receiving prenatal care before thirty weeks into the gestation period. The purpose of this study is to identify the barriers to prenatal care and potential initiatives that may alleviate them. This study will exhibit the possible programs that may increase the use of prenatal care and social interventions that may reduce the current problem in Memphis. In addition research will exhibit programs in similar urban areas which have proved to be successful.

Special Sessions:

These are all nonjuried sessions featuring scholarship from Rhodes students who are studying specific topics like animal behavior, or are participating in specialized programs like the Storm Water Environmental Education Program (SWEEP).

Poster Session for Molecular Biology: Lynx Genome Project
Frazier Jelke Lobby beginning at 1:15 pm until 2:30 pm

Session organizer: Gary Lindquester, Department of Biology.

This session will run concurrently with the juried Natural and Social Sciences Poster Sessions. All posters will be available for viewing from 1:00 to 4:00. At least one of the student collaborators will be in attendance and available for discussion from 1:15-2:30. If a specific collaborator is presenting, that coauthor name is underlined.

Analysis of the *Lynx lynx* COX3 Gene and Cytochrome C Oxidase (CcO) Subunit III
Adam Bohnert
Lauren Kokajko
Melissa Tucker

The Eurasian lynx (*Lynx lynx*), like many large carnivores, is an animal which for some time has been threatened with extinction. However, as knowledge of genetic diversity has expanded over the past decades, effective conservation has become a distinct possibility. In this study, such genomic analyses were carried out firsthand in an attempt to gain an appreciation for the benefits which they present. cDNA clones from *Lynx lynx* were isolated from appropriate plasmids and sequenced, yielding a DNA sequence for the COX3 gene encoding cytochrome *c* oxidase subunit III. Cytochrome *c* oxidase subunit III is a protein which serves a primary role in the assembly of a larger 13-subunit enzyme vital to the respiration chain. Analyses of the relevant *Lynx lynx* DNA and protein sequences along with those of other large cats provided phylogenic trees that were quite in accordance with published trees. Sequence alignments also indicated that these sequences are quite conserved, as should be expected given the functional significance of cytochrome *c* oxidase subunit III.

Determining the High Conservation of Transformation Growth Factor Beta Type II Receptor through Genetic Analysis
Megan McKenna
Kelly Brier San Miguel

The individual cDNA clones from generated *Lynx lynx* fibroblast cell mRNA were first isolated and sequenced. Using a blastn Blast search, the original nucleotide sequence was compared to those within the international sequence database. The nucleotide sequence of the gene resembling the original nucleotide sequence was then translated through the NTI program. With a protein blastp Blast search, this protein was compared to those of other organisms within the database. The sequence is homologous to the *Canis famililiaris* transformation growth factor beta type II receptor, which is responsible for carcinogenesis resistance, and this protein is present in a variety of organisms with an extremely similar protein sequence, indicating that there are highly conserved areas of this protein sequence among multiple species.

Analysis and Classification of a Novel sequence in *Lynx lynx*
Caroline Sartain
Paige Anderson
Christina Campion

Genome projects are efforts which aim to map the entire genome of a species and the genes contained within these nucleotide sequences. Once determined, these sequences can be applied to both medical and commercial

research, and can aid in answering questions regarding evolution and inter-specific homology. To do this, homologous gene sequences are aligned and, depending on similarity, an evolutionary relationship can be determined. In our project, we obtained sequencing data from a portion of the Eurasian lynx (*Lynx lynx*) genome, and discovered the genetic code for catalase within that genomic fragment. Catalase is an enzyme that catalyzes the conversion of hydrogen peroxide to water and oxygen. Experimentally obtained phylogenetic trees suggest that *L. lynx* catalase is most closely related to the catalase found in *C. familiaris*. Dot matrix plots show that catalase is fairly conserved across species. Other studies have shown that random insertion of introns accounts for most of the evolutionary divergence; coding sequences are otherwise fairly conserved.

Identification of the Pak 2 gene within the *Lynx lynx* Genome

Kristina Lynch
Justin Marlar
Matthew Ricke

Genome projects are important for understanding the relationships between different organisms as well as identifying the genes that are involved in common biochemical processes. The purpose of this genomic project is to compare genomic sequences and indicate ancestral threads between multiple species by finding common phylogenies. The lynx Pak 2 gene in the lynx was sequenced at UT Health Center. It was then translated into an amino acid sequence, which was then analyzed via a blastp BLAST search. From this search, several species with similar Pak 2 sequences were found, and these sequences were compared by multiple sequence alignment, phylogenetic tree, and dot matrix. The phylogenetic tree created through the multiple sequence analysis indicated that the relationship between the lynx Pak 2 protein and the human, mouse, rat, and rabbit Pak 2 protein is very similar to that of the commonly accepted phylogenetic tree. The Pak 2 protein is a member of the Pak gene family and is important in mechanisms for increasing cell motility, as well as cell survival and proliferation.

Identification and Analysis of the Beta-Actin Gene in the *Lynx lynx* Genome

Grant Bale
Courtney Cockerell
Deena Patel

In this experiment, four individual cDNA clones were isolated from Eurasian Lynx fibroblast cell mRNA.After performing a blast search on each clone using NCBI, it was determined that each clone translated a different protein. One clone, LY-001, translated to encode the Beta-Actin gene. After running a blastp search of the DNA sequence, results were compared to the swissprot database for mathcing sequences by multiple sequence alignment, phylogenetic tree, and dot matrices. The searches showed that the Beta-Actin Gene sequence is very similar to the Beta-Actin Gene in many other organisms, most similar to a sheep, *Ovis aris.* It can be concluded that the Beta-Actin Gene is essential to all eukaryotes and it is integral to cell processes such as motility with cytoplasmic actin and organism functions like movement in general as is seen in cytoskeletal actin.

Sequence Analysis of Cytochrome c Oxidase Subunit I from *Lynx lynx* cDNA Clones

Jennifer Em
Brittany Solar
Kourtney Schroeder

Cytochrome c Oxidase (COX) is an inner membrane protein found in the mitochondria of eukaryotes. As the terminal enzyme of the respiration chain, its major role is catalyzing the reduction of water in cellular respiration. More specifically, the protein of interest in this study is Cytochrome c Oxidase subunit I (COX I) which is one of 13 subunits that make up COX. In this experiment, we isolated DNA from the Eurasian Lynx fibroblast cell mRNA and analyzed and compared our sequence against other existing sequences using program=BLASTn. By comparing the protein encoded (COX1), we were able to distinguish evolutionary differences and similarities between the *Lynx Lynx* protein and that of other members of the feline family. Our results demonstrated that although COX1 is highly conserved among the feline family, we were able to detect minute variances in the nucleotide sequences using dot matrix analysis and phylogenic mapping. The degree of difference between the analyzed nucleotide sequences corresponded to previously published mapping of the feline phylogenic tree.

The Rhodes Learning Corridor: Mentoring High School Science

Posters presented by Central High School students, in collaboration with St Jude Children's Research Hospital Mentors

Posters will be available for viewing on the day of the Symposium in the Natural Sciences Poster Session (see page 25).

Participating Students:
Victoria Boyd
Wynter Foley
Keiondra Harris

Participating Rhodes Students:
Scott Barb
Valerie Hartmann
Amy Ross
Abbie Tucker

Participating St. Jude Mentors:
Dr. Monica Arroyo
Dr. Scott A. Brown
Dr. Marguerite Evans-Galea
Dr. Michelle Hamlet
Dr. Rachael Keating
Dr. Roberta Leonardi
Dr. Laura Luque de Johnson
Dr. Lisan Parker
Dr. Matthew Sandbulte
Dr. Paul Thomas

Environmental Research: Addressing Sustainability at Rhodes
410 Rhodes Tower, beginning at 1:00 pm until 2:30 pm

Session organizer and Chair: Carol Ekstrom, Department of Physics (Geology).

This is the sixth year of a special session focusing on the local environment. The research projects for Environmental Geology 214 are sponsored by a grant from the Associated Colleges of the South's Environmental Initiative, Campus as a Laboratory for Sustainability Alliance.

1:00-1:15 **Environmental Residents: Integrating Environmental Awareness and Programming with Student Residential Life**
Leslie Samuelson
Faculty Mentors: Katherine Panagakos[1] and Christopher Seaton[2]
Departments of Greek and Roman Studies[1] and Mathematics and Computer Science[2]

At several of the Associated Colleges of the South, an Environmental Resident program has made a profound impact upon the lives of students. By bringing this project to Rhodes College, we hope to increase students' awareness about the impacts of environmental issues on their daily lives, increase the number of environmental programs on campus, and strengthen the college's current recycling efforts. At Rhodes, the Environmental Resident program will place one Environmental Resident in each dorm, where they will live among the students that they mentor. They will mentor them by advising them as to the right course of action in reducing their environmental impact, developing and implementing programs by which students can enjoy taking part in environmentally meaningful activities, and act as role models for more sustainable living.

1:15-1:30 **Impacting the Environment: A Rhodes Pledge**

Josh Davis
Joseph Morris
Emily Popp
Cameron Rochelle
Faculty Mentor: Carol Ekstrom
Department of Physics (Geology)

Our environment is one of the most important and least appreciated resources that we rely on daily. Most people go an entire day without considering all the things that our environment provides, such as water, air, and food. Most of our survival needs come directly from nature; and humans, for a long time, thought that we could not run out of these resources. As our technology and knowledge of the environment has grown, we have come to realize that the environment is a finite resource and at the rate we have been consuming it, we will not have enough to sustain the human population for much longer. There are many steps being taken to teach and encourage conservation of these resources but every human need to be a part of that conservation movement to make a lasting impact on the environment. Rhodes College has the ability to be a part of that movement and educate its students about conservation. We have researched other colleges and universities attempts at conservation and have created a pledge for Rhodes students to sign as a way for them to become aware of the problems facing the environment, and as a first step to impacting the environment themselves.

1:30-1:45 **A Fresh Look towards Environmental Action: Incorporating a Sense of Environmental Integrity in Freshman Orientation**

Becky Ferguson
Lauren Neupert
Shelton Oakley
Anna Stagg
Faculty Mentor: Carol Ekstrom
Department of Physics (Geology)

The purpose of our project is to explore possible options to incorporate an environmental pledge into the Rhodes community. The overarching goal of this project is to increase environmental awareness and consciousness of sustainable practices on our campus in hopes to inspire students to take a more pro-active stance on environmental conservation. Through discussions with Rhodes administration, we found that the best avenues to explore are the Orientation and Residential Programs on campus. We hope to have the PA's, RA's (Resident Assistants), and ER's (Environmental Residents) working together to effectively give incoming freshman the pertinent information about sustainable practices on Rhodes campus.

1:45-2:00 **Green Energy**

Caroline Fabacher
Emily Grace
Lucy King
Sean McKenna
Faculty Mentor: Carol Ekstrom
Department of Physics (Geology)

(No abstract submitted.)

2:00-2:15 **Plans for an Environmental "Memphis Connection"**
Anne Barenkamp
Adam deNobriga
Wheeler Graf

We investigated projects that could be included into a Memphis Connection trip for Orientation that would focus on sustainability and the environment. One of these was Sardis Lake, a Mid-south state park in Sardis, MS. The lake was created in 1940 to aid in the flood control of the Yazoo River Basin, and includes a dam, swamp and flood channel. This trip would give incoming freshmen the opportunity to experience various aspects of water control and its affect on the environment in the Mid-south. Other projects include the environmental footprint of the Rhodes library, and campus efforts to promoting sustainability.

2:15-2:30 **A Survey of Campus Sustainable Practices**
Paul Echols
Artie Quinn
Collin Shultenover
Faculty Mentor: Carol Ekstrom
Department of Physics (Geology)
(No abstract submitted.)

Community Involvement in Environmental Research: SWEEP: Storm Water Environmental Education Project

Faculty Mentor for SWEEP: Carol Ekstrom, Department of Physics (Geology)

SWEEP ***is an after-school program that partners Rhodes College and Cypress Middle School to focus on science and environmental education. It was funded by an EPA grant for 2002-2003, an Associated colleges of the south, Campus/Community Partners grant for 2004, A Congressionally Directed Gant for 2004-2006, and a HUD COPC grant for 2005-2007. Rhodes students John Gehrig, Lorrayne Mallott, Kevin Dinh, and Sara Connaughton have worked with Cypess SWEEP students on a variety of projects.***

Our SWEEP partners are Cypress Middle School science teachers Ms. Brenda Pritle, Ms. Gwendolyn Shorter; Cypress Middle School Principal Mr. Raymond Vasser; Cypress Middle School students Jerome Bolton, Erica Bush, Darrell Clark, Andrea Clark, Andrea Conley, Ferrell Daylos, Terry Donald, Jerrel Douglas, Tierre Dugger, Chorlie Every, Isaac Grandberry, Ronnie Harris, Deandre Hill, Anntanaise Lewis, Marcus McAdams, Rodrequize Mcatec, Alexias Moore, Roderick Moore, Kai Owens, Jerrica Parker, Courtney Pollion, Alford Robinson, Layla Robinson, Curnessia Sanders, Jevin States, Janeisha Walker; A.K.A. sorority, and Lichterman Nature Center.

Lobby by Frazier Jelke Room 143, and Frazier Jelke Amphitheatre

2:30-3:20 **SWEEP models and posters.**

3:20 **SWEEP rap in FJ Amphitheatre (rain location: Frazier Jelke Lobby)**

Biology II Laboratory Projects: Crayfish Behavior

Frazier Jelke 141w and 143w, beginning at 1:15 pm until 2:45 pm

Session Chairs: Rosanna Cappellato, Jim Armacost, and David Kesler, Department of Biology

Interspecific and Intraspecific Competition Between *Procambarus* sp. and *Orconectes virilis*.
Karen Haynie
Emily Kee
Brandan Shortell
Nema Patel
Audrey Marsidi
Faculty Mentor: David Kesler
Department of Biology

The Effect of Water Temperature on Crayfish Substrate Preference
Meredith Reynolds
Cate Marshall
Anastasia Hartzes
Taylor Barnes
Faculty Mentor: David Kesler
Department of Biology

How Substrate Dimensions Affect Crayfish Behavior
Margie Smith
Megan Schonebarger
Tayler Phelps
Jacy Gentry
Adam Haynes
Faculty Mentor: David Kesler
Department of Biology

Crayfish Preference for a Colored Light Environment
Lauren Lambeth
Rob Palutsis
Katy Joyner
Courtney Armstrong
Michael Tufton
Faculty Mentor: David Kesler
Department of Biology

The Effects of Agitation on Agonistic Behavior in Crayfish
Brent Hubbard
Ravi Patel
Bekka Russ

Adam Teer
Faculty Mentor: David Kesler
Department of Biology

Rumble in the Swamp
Michael Hadler
Will Andress
Charles Hoggard
Faculty Mentor: David Kesler
Department of Biology

The Effect of Water Temperature on Crayfish Aggressive Behavior
Daniel Wilkinson
Lane Lovett
Ella Neely
Todd Madison

Temperature Aggression Tendencies of *Procambarus* sp.
Claire Litherland
Mary Ellen Dumas
Jessica Cross
Whitney Hayden
Faculty Mentor: David Kesler
Department of Biology

Creature Comforts: The Substrate Preference of Female Crayfish
Kara Purdy
Kate Parker
Megan Fogelman
Pam Raasch

The Effects of Sex Differences on Agonistic Behavior in *Procambarus* sp.
Kelsey Dean
Lindsey Gibson
Sabrina Seriff
La'Sandria Ward
Faculty Mentor: David Kesler
Department of Biology

Male vs. Male and Male vs. Female: Does Gender Affect Crayfish Aggression?
Drew Hubbard
JR Bizzell
Michael Powell
Beven McWilliams
Faculty Mentor: Rosanna Cappellato
Department of Biology

Does Water Quench a Crayfish's Thirst for Aggression? The Effect of the Absence of Water on Crayfish Agonistic Behavior
Stephanie Wilson
Chang Liu
Sina Nezakatgoo
Tomo Suzuki
Faculty Mentor: Rosanna Cappellato
Department of Biology

That Don't Impress Me Much: Male Crayfish Aggression Patterns in the Presence of a Female
Stephanie Olds
Ryan Jessee
Masters Richards
Zetta Fayos
Faculty Mentor: Rosanna Cappellato
Department of Biology

The Effect of Shelter on Male Aggression
Jonathan Holt
Joel Chasan
Julie Carter
Stephanie Spurgat
Faculty Mentor: Rosanna Cappellato
Department of Biology

Effect of heat on crayfish aggression
Adam Faucheux
James Newman
Griffin Morrisson
Faculty Mentor: Rosanna Cappellato
Department of Biology

Relative Aggressiveness of Crayfish of Different Genera (*Procambarus* and *Orconectes*)
Kristen Lytle
Matt Yantis
Brooke Bacuetes
Sonal Patel
Faculty Mentor: Jim Armacost, Jr.
Department of Biology

Does Light Affect Aggressive Behavior of the Crayfish (*Procambarus* sp.)?
Robert Crimi
Betsey Haight
Julia Draper
Becky Cook

Faculty Mentor: Jim Armacost, Jr.
Department of Biology

The Effect of Water Temperature on Aggression in the Crayfish (*Procambarus* sp.)

Mehul Patel
Evan Somers
Arijit Paul
Anum Minhas
Arthur Riggs
Faculty Mentor: Jim Armacost, Jr.
Department of Biology

The Effect of Shelters on the Agonistic Behavior in the Crayfish (*Procambarus* sp.)

Elizabeth Wingo
Kim Green
Taylor Butker
Laura Pettibon
Faculty Mentor: Jim Armacost, Jr.
Department of Biology

Does Aggressiveness Differ Between Crayfish of Different Genera (*Procambarus* and *Orconectes*)

Dean Shroyer
David Johns
Jesse Everett
Brett Miller
Faculty Mentor: Jim Armacost, Jr.
Department of Biology

Index of Rhodes College Presenters and Mentors

Acknowledgement and Special Thanks to the following contributors:

Session Judges: Rhodes Faculty (F = Fine Arts, H = Humanities, N = Natural Sciences, S = Social Sciences)

Kevin Collier (F)
David Mason (F)
Brian Warren (H)
John Kaltner (H)
Tom Barr (N)
Shubho Banerjee (N)
Chuck Orvis (S)
Raechelle Marscarenhas (S)
Steve Lloyd (S)
Carole Blankenship (F)
Glenda Swan (F)
Anna Dronzek (H)
Tom Bremer (H)
Ivaylo Ilinkin (N)
David Kesler (N)
Kellie Mask (S)*
Julie Steel (S)
Mike Kirby (S)
Diane Clark (F)
Genevieve Hill-Thomas (F)
Patrick Gray (H)
Eric Gottlieb (N)
Ann Viano (N)
Mauricio Cafiero (N)
Chris Wetzel (S)
Meg Carne (S)
Anita Davis (S)
* Economist, Federal Express

Session Judges: St. Jude Children's Research Hospital Mentors

Zachary Baquet, PhD, Developmental Neurobiology Department
Laura Luque de Johnson, PhD, Infectious Disease Department
Kyle Johnson, PhD, Hematology-Oncology Department
Shayna Street, PhD, Hematology-Oncology Department
Ina Radtke, PhD, Pathology Department
Paul Gibson, PhD, Department of Developmental Neurobiology
Melanie Van Stry, PhD, Hematology-Oncology Department

Musicians: Rhodes Jazz Combo and Plenary Lecture pianist

John Bass (Director)
Josh Jefferies (trumpet)
Tomo Suzuki (alto saxophone)
Chris Lemke (alto saxophone)
Charles White (tenor saxophone)
Dane Meyer (clarinet)
Joe Noel (keyboard)
Ryan Nall (guitar)
Stephanie Swindle (bass)
Joe Noel (piano)
Rene Orth (piano)
Nate Smith (drums)

Special Session Organizers

Tony Becker and Lisan Parker (St. Jude Children's Research Hospital): *The Learning Corridor: Mentoring High School Science with St. Jude Mentors*
Carol Ekstrom: *Environmental Research: Addressing Sustainability at Rhodes*
Carol Ekstrom: *Environmental Research: SWEEP events*
Rosanna Cappellato, Jim Armacost, David Kesler: *Biology II Laboratory Posters*
Gary Lindquester: *Molecular Biology: Lynx Genome Project*

This event is made possible through the generous support of the Robert and Ruby Priddy Charitable Trust of Wichita Falls, TX.