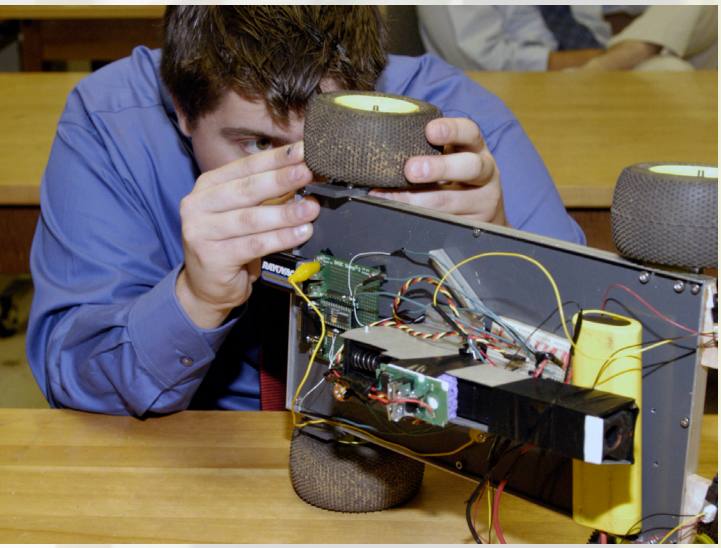
Undergraduate Research and Creative Activity Symposium



April 27, 2007
Memphis, Tennessee

Rhodes College
—1848—

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2007 Symposium Planning Committee

Ryan Byrne (Humanities)

Courtenay Harter (Fine Arts)

David Kesler (Natural Sciences)

Nick McKinney (Social Sciences)

Judith Pierce (administrative assistant)

Robert Strandburg (Chair, Dean of Academic Affairs for Curriculum)

Kristin Wheeler (student representative)

Special Events

Enjoy a **"Ratnic"** lunch with our community of scholars outside Burrow Refectory!
(Rain location: inside Burrow Refectory)

Closing Reception will be held at the Barret Library Cloistered Walkway at the east entrance, 4:00-5:30 pm. Music will be provided by the Rhodes Jazz Combo.

Acknowledgments and Special Thanks to the following contributors:

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

Mauricio Cafiero (N)
Rosanna Cappellato (N)
Brandon Goff (F)
Courtenay Harter (F)
Eric Henager (H)
Brent Hoffmeister (N)
Amanda Irwin (H)
Tom McGowan (S)
Nick McKinney (S)
Mark Muesse (H)
Amy Risely (S)
Robert Saxe (H)
Chris Seaton (N)
Julie Steel (S)
Gail P. C. Streete (H)
Katheryn Wright (H)

Special Session Organizers

Mike Kirby: Hollywood Springdale

Carol Ekstrom: Spatial Analysis in GIS and SWEEP LEAPs to Robotics

Jim Armacost, , Tony Becker, Carolyn Jaslow, and David Kesler: Biology 141 Laboratory Projects: Crayfish Behavior

Rhodes Jazz Combo

This event is made possible through the generous support of the

Robert and Ruby Priddy Charitable Trust of Wichita Falls, TX.

CODA

Center for Outreach in the Development of the Arts

When: Friday 27 April, 6-11pm
*art installations from the Art Club will be on view during the day from 2pm onward.

Where: Fisher Gardens

The CODA scholarship recipients format an on-campus arts event each Spring term in order to understand the various aspects of coordinating arts productions as a group. From concept development, content programming, artist collaboration, project promotion, documentation and evaluation, the CODA students adapt to the challenges and insights each variable presents in order to accomplish their collective tasks and give the Rhodes campus community a unique arts experience.

This year's Juxtap'art event focuses on the premise of the Gesamtkunstwerk, or 'total work of art,' first invoked by composer Richard Wagner (b. Leipzig, 1813-1833) to describe an operatic performance which encompasses music, theater, and the visual arts, literally meaning 'synthesis of the arts,' Wagner placed great importance on 'mood setting' elements, such as a darkened theater, sound effects, and seating arrangements which focused the attention of audience on the stage, completely immersing them in the imaginary world of the opera.

For Juxtap'art, elements of video, graphic arts, lighting, 'invisible theater,' and original music by Rhodes College students contribute to a synaesthetic 'atmosphere' whereby the entire space acts as a participatory arena in which artwork, soundtrack and audience interact in the production of the 'total work of art.' The title of this year's event is adapted from the visual arts term 'juxtaposition,' describing the act of placing various elements in close context to produce a composition.

Fine Arts Oral Presentations

100 Hassell Hall, beginning at 1:00 pm until 4:00 pm

Session Chairs: Brandon Goff and Courtenay Harter, Department of Music

1:00-1:20 **Abstraction No. 1**

Amy Wells
Faculty Mentor: Brandon Goff
Department of Music

Since the Romantic Period, music is most often used to evoke or depict a mood, character, story, or philosophical ideal of the composer. With the increased use of digital sounds and means of production of music, the 400 plus years of Western Music History, and the saturation of background noise–commonly considered music–in society, it is the challenge of acoustic composers to create music that is interesting, meaningful, and good. While "Abstraction No. 1" is not evocative of any extra musical idea, as one might garner from the title, it attempts to grab and hold the listener's attention strictly through its style. Its obsession with and repeated return of a handful of melodic and motivic ideas keeps the listener grounded despite being largely incomprehensible otherwise.

1:20-1:40 **Ecclesia and Synagoga: The Way of God versus The Blinded Path**

Alix Orza
Faculty Mentor: Victor Coonin
Department of Art

Multiple studies have been performed on the personifications of the Christian and Jewish belief systems during the medieval age. In the past, these studies have focused on each representation individually. When placing these figures together chronologically there is a noticeable trend in favor of the Christian church. Although each example in this presentation depicts the same two figures, there is an obvious growing display of anti-Semitic feelings towards the Jewish "other." Instead of one belief system leading into and providing the base for another, there gradually becomes a stark distinction between the Jewish and Christian faiths. Iconographic associations of the Jews become examples of their supposed inferiority due to their lack of acceptance of Christ. Placing the figures together and viewing them in a continuum allows insight into how the religious society was evolving during the Middle Ages. This emerging tendency can only be seen when comparing them to the preceding representations and the traditions of the figures.

1:40-2:00 **A Tale of Two Composers: The Influence of Schoenberg's *Kammersymphonie für 15 Solo instrumenten, Op. 9* on Adam's *Chamber Symphony***

James Cornfoot
Faculty Mentor: Courtenay Harter
Department of Music

Musicologists often cite Arnold Schoenberg as the man who created a new musical aesthetic in the early 20th century that destroyed any traditional notions of functional harmony and tonality, and Shoenberg's music often features a highly chromatic, atonal musical language. Schoenberg's entire corpus of music does not embody this new atonality, for his earlier music, such as his first *Kammersymphonie, Op. 9*, still retains functional harmony found in common-practice music. In the late 20th century, the American composer John Adams writes his own *Chamber Symphony*, and he himself notes that Schoenberg's *Kammersymphonie, Op. 9* inspired his own, newer work. Using musical forces that appear eerily similar to Schoenberg's own ensemble, Adams pays homage to his muse through this work. This paper seeks to establish any possible connection between the two chamber works by means of orchestration, formal analysis, and harmonic analysis.

2:00-2:20 **Break**

2:20-2:40 **The Lovechild Between Voice and Technology**
Beven McWilliams
Faculty Mentor: Brandon Goff
Department of Music

New technology has become an integral part of modern music production. The ever increasing capacity of computers, mixed with artists desire to create unique sounds, produces cutting edge effects that continue to develop and expand into various genres. Within the realms of music production, new technology facilitates new ideas and expressions. An example of such technology is the vocoder, developed in the 1930's as a speech coder to ensure secure radio transmissions. The first musical vocoder was developed by Wendy Carlos and Robert Moog in the 1970's, where a modular synthesizer would carry a signal from a microphone input. This vocoder was featured in Stanly Kubrick's A Clockwork Orange and then began to appear in pop music and disco. The 1980's "new age" music produced many electronic and experimental artists who utilized the vocoder to create original sounds and effects such as Jean Michel Jarre, a pioneer in experimental music and synthesizers. Modern artist Imogen Heap manipulated her voice through a MIDI keyboard and would play the harmonies she wanted her voice to perform while singing. The project presented has stemmed from the ideas of voice modification. The work entitled Pity was developed with a completely accapella vocal technique that utilizes modern vocoding and adds a new twist to the vocal/computer marriage.

2:40-3:00 **Framing a Family: Three Photographers Construct Childhood and Maternal Identity in Their Art**
Emily A Baldwin
Faculty Mentor: David McCarthy
Department of Art
Susan Tidball Means Award in Women's Studies project

Clementina, Viscountess Hawarden (1822-1865), Imogen Cunningham (1883-1976), and Sally Mann (b. 1951) are recognized photographers, though the positions they occupy in photographic history range from the beginning of photography as an art, to its modernist movement into galleries, to today's world of MA programs and coffee table books. Photography is a unique art in that it constantly must walk the line between construction and documentation. The photographer constructs images by framing and shooting a moment in time, but simultaneously documents that one moment, creating a record that will long outlast the moment itself. These three women artists present a specific subject of construction and documentation that is inherently linked to their own personal identities: they all took pictures of their children, setting up a tension between the artist who frames the picture and the mother who both constructs and documents her children. An examination of the choices they have made in creating art, the physical properties and appearance of the resulting images, and the historical context in which they were made and viewed, reveals not some underlying essential truth about mother artists, but rather three distinct visual descriptions of childhood. While an image of childhood is the primary construction that appears in the images, each artist is also secondarily constructing her own maternal and artistic identity.

3:00-3:20 **A New Color**
Rene Orth
Faculty Mentor: Brandon Goff
Department of Music

The term 'music' is a very general word for an extremely diverse group of sounds. Each distinctive musical culture uses a unique combination of melodies, harmonies, text, and timbres, forming different shades of color. The goal of this project was to combine aspects of Chinese music and the Western musical tradition – two vastly different colors – together in hopes of

developing an entirely new color. Yu (Rain) is a three-movement work that sets the poetry of Li Qingzhao, a woman poet of 11th-century Song Dynasty China. The Rhodes Women's Chorus performed the third movement, Dian Di (Drip Drop), on April 16, 2007. This presentation will take an extensive look at the process of its composition, covering the influences, guidelines, and challenges of producing a cross-cultural sound.

3:20-3:40 **Break**

3:40-4:00 **Ramon Sender's *Tropical Fish Opera*: Conceptualism from The San Francisco Tape Music Center**

Megan Norman
Faculty Mentor: Courtenay Harter
Department of Music

In the late 1950's, American composers were in the beginning stages of breaking down almost every artistic boundary that had been created throughout the history of western music. Directly influenced by the devastation and agony caused by World War II, much of the Western world was dominated by an overwhelming need for rules and regulations to ensure control and safety in every realm of life—including the arts. However, this idea of control would not last for long. On December 18, 1961, the first Sonic was performed in the attic of the San Francisco Conservatory, including works created and performed by Ramon Sender, Pauline Oliveros, Phil Winsor and Terry Riley. This concert was the beginning of what was to become the San Francisco Tape Music Center (SFTMC), a place dedicated to the creation and performance of innovative music. Opening the concert was a new and interesting example of ever-changing and unpredictable--yet *notated*—music: *Tropical Fish Opera* by Ramon Sender. This was music that was essentially untouched by humans—whatever was played, was written by the fish as they simply existed in their tank. Today the piece continues to change wherever it is performed: It illuminates the beauty of individual choice and nature's movements, creating a product that combines chance with certainty, improvisation with notation, and player with fish.

Those with knowledge of musical notation should bring an instrument for the interactive portion of this presentation.

Humanities Oral Presentations – Session 1A

313 Clough, beginning at 10:40 am until 11:55 am

Session Chair: Robert Saxe, Department of History

10:40-11:00 **Parallel Americas: The Perception of Irish-American Gang Violence in New York City Newspapers, 1850-1880**

Kelly Garner
Faculty Mentor: Robert Saxe
Department of History

During the mid nineteenth century, Irish immigrants employed gang violence as a means of assimilation into the dominant Anglo-American, middle-class culture. Violence was an acceptable form of political and social activism in Ireland during the eighteenth and nineteenth centuries, and was adapted by immigrants as a means of asserting a place for themselves in America. However, the meaning of gang violence changed when it was applied to urban, immigrant communities in the United States. Rather than being a means of ethnic exclusion, it became a tool of class inclusion for Irish immigrant men. In addition, it served as a way of defining masculinity outside of the middle class standards for male behavior. Examining the meaning of gang violence to these men is difficult due to the lack of written sources by the immigrants themselves, but newspapers from the period serve as access point into reconstructing the way both Anglo-American and Irish-American communities understood and viewed violence in terms of class, ethnicity and gender.

11:05-11:25 **Dichotomies of Manga**

Erin Brown
Faculty Mentor: Katheryn Wright
Department of Modern Languages and Literatures

Japanese comic books or manga, continues to be one of the dominant cultural exports of Japan. The origins of manga can be traced back to ukiyo-e or wood block prints, however the true birth of manga resulted from a response to Western styles of drawing. Manga is a form that contains many dichotomies in its form and function. Manga is a unique product of Japanese story-telling in which two components, art and written text balance each other in the overall composition of the work. Manga as a genre, contains works of both high literary quality and also mass popularity. The production of manga is usually done by one or two people which results in a personal, yet public dialogue with society. Manga, as a popular form of communication, is a medium to explore values in society such as gender, environmentalism, history, and ethics

11:30-11:50 **The Purposes and Methods of Greek and Roman Travelogues Applied to a Modern Context**

Tulisha Jackman
Faculty Mentor: David Sick
Department of Greek and Roman Studies

Travelogues are a medium in which the author allows the reader to experience an unfamiliar culture or location. Herodotus used *The Histories* to explain to the Greeks about non-Greeks and their customs. He concentrates on interesting geographical features and cultural aspects of peoples that are different from Greeks. For Pausanias, a Greek from Asia Minor, the mainland of Greece was unfamiliar, was "the other." He was fully Greek but was also a stranger to the mainland. In his *Periegesis* he concentrates on displaying places of religious significance and creates a Greek pilgrimage. Similarly, in the fourth century CE the western provincial Egeria was a stranger to the Biblical Holy Land. She chronicled a multiyear journey to share with her friends back home about the monuments and settings from the Bible. Her narrative is presented in the first person, yet still maintains an impersonal feeling similar to Pausanias'. After analyzing the purposes and styles of these three authors, I will present a Latin travelogue to Memphis that I have composed incorporating features of these three ancient authors. I will read and explicate various portions of

this travelogue to show the application of the purposes and styles in a modern but Latin setting.

Humanities Oral Presentations – Session 1B

302 Clough, beginning at 10:40 am until 12:20 pm

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

10:40-11:00 **The Social Criticism of Antonio Buero Vallejo**

Cate Majors

Faculty Mentor: Eric Henager

Department of Modern Languages and Literatures

Twentieth-century Spanish author, Antonio Buero Vallejo, has gained a great deal of fame in our epoch for his literary work and social criticism. His writing consists of social themes, which are creatively transformed from controversial ideas to simple observations of society through his utilization of the literary technique, symbolism. The author is also celebrated for his great enthusiasm for the visual arts. His incorporation of the artist's life as one of the vital elements of his writing clearly reflects this affection. Two of his works, *Las Meninas* (1961) and *El sueño de la razón* (1970), serve as extraordinary examples of this aspect of his literature and social criticism. Buero Vallejo's personal experience in the Republican Party during the Spanish Civil War also contributes a great deal to his literary work. Themes such as desperation and hope are predominant in most of his work, and they also contribute much insight into his social criticism and his ideas regarding the moral development of Spanish society. For its focus on social questions and development of tragic themes regarding history, the theatrical work of Antonio Buero Vallejo marks a very distinctive period in the history of Spanish literature.

11:05-11:25 **Federico García Lorca como personaje en la poesía de sus compañeros**

Daniel Case

Faculty Mentor: Eric Henager

Department of Modern Languages and Literatures

Federico García Lorca was arguably the most internationally renowned and celebrated writer of Spanish nationality in the 20th century. This lofty status, however, was achieved in the mere thirty-eight years of a life that was cut short by his tragic and controversial death/murder by the Nationalist party at the beginning of the Spanish Civil War. Since that time, Lorca's life, his work, and his death have been converted into symbols for various causes such as that of the Spanish Republican party, the fight for the valuation of women and their rights, and the fight for racial equality. These conversions, though certainly not illogical, are somewhat unfair in that Federico claimed to be disinterested in politics. However, it is very true that he gave to and fought for various people and groups. In this study, between fifteen and twenty poems that include him or that are specifically dedicated to him have been selected and analyzed in order to determine how Lorca's fellow writers have chosen to portray his life and death. This is a new angle in the study of the life and work of García Lorca and one that could prove to be very helpful in understanding such an influential figure.

11:30-11:50 **La identidad de la conquista: Explorando "el otro" en la identidad hispanoamericana**

Lucy Mason

Faculty Mentor: Eric Henager

Department of Modern Languages and Literatures

En The Second Sex Simone de Beauvoir dice que el grupo más poderoso siempre crea un "otro" o opuesto en la sociedad para establecer y reforzar su propia identidad. Mientras usa esta teoría para referir a la dinámica entre hombres y mujeres, se puede ver otros ejemplos de esta conducta en diferentes situaciones sociales. La conquista del nuevo mundo era unos de los primeros momentos de contacto entre la civilización europea y la americana. Por las escrituras de

Hernán Cortés, Bernal Díaz del Castillo, Bartolomé de las Casas, y El Inca Garcilaso de la Vega se puede examinar como establecen los europeos sus propias identidades muy poderosas y masculinas como conquistadores y consecuentemente como crean una identidad percibida muy sumisa y débil por "el otro," las indígenas y las mujeres. Como un producto directo de la conquista y la integración de dos culturas muy diferentes, la percepción del "otro" todavía puede tener una influencia en Hispanoamérica. Por las escrituras de autores como Octavio Paz, Carlos Fuentes, y Rosario Castellanos se puede ver una nueva percepción literaria de la identidad social. En la literatura y la historia la percepción y establecimiento de identidad ha tenido una influencia fuerte sobre la sociedad hispanoamericana.

11:55-12:15 **La Busca de una Identidad Femenina en la época de la Guerra Suica en los trabajos escritos de Luisa Valenzuela**

Jodi Malone

Faculty Mentor: Eric Henager

Department of Modern Languages and Literatures

Luisa Valenzuela, an Argentinean author, is recognized for her powerful and creative use of language. In her works, "Cambio de Armas," Realidad Nacional desde la Cama, and "Simetrías" Luisa Valenzuela uses shocking and at times humorous language to explore the search for a feminine identity in the context of the Dirty War in Argentina. All three protagonists through their very different experiences are forced to face the repercussions of the tragedy of the military coup in the 1970's that caused the deaths and kidnappings of thousands of Argentineans. These three stories all bring up the question of what to do and how to recover psychologically from a national tragedy. These works are further analyzed in the context of Liberation Social Psychology, a modern psychology movement in Latin America, revealing the necessity of finding an individual identity as well as a larger group identity that fits the protagonists' perceptions of the recent tragedy.

Humanities Oral Presentations – Session 2A

313 Clough, beginning at 1:30 pm until 2:45 pm

Session Chair: Mark Muesse, Department of Religious Studies

1:30-1:50 **Christ and Apollo: Classical Paganism vis-à-vis Christianity in the Sonnets of Petrarch**

Mackenzie Zalin

Faculty Mentor: Charles Arndt

Department of Modern Languages and Literatures

In addition to establishing the very precepts of Humanism at the onset of the Italian Renaissance the 14th century, the sonnets or *Canzoniere* of western Europe's first classical scholar, Petrarch, are renowned for their uncompromising glimpse into the doldrums of amorous longing and desire as exemplified by the author's elusive muse, Laura. While this diverse series of 366 poems is meritorio its own literary right, closer examination of the numerous classical images and motifs found throughout Petrarch's sonnets illustrates a crisis of ideals that tormented the progenitors of the Rena with respect to many of their artistic, scientific and literary endeavors in light of the conflict between Christian and Greco-Roman religious mores. As in Dante's *Divine Comedy*, Petrarch's own exhaustive, highly-interdisciplinary survey of this pressing religious question ultimately asserts that Christianity must take precedent over pagan symbolism in spite of the overwhelming prevalence and significance of classical influence as an essential component towards the understanding and appreciation of the sonnets as a product of the Renaissance.

1:55-2:15 **Endangered but Not Extinct: An Analysis of the Resilience of Serpent-Handling Sects in Southern Appalachia**

Anna Lee Blanton
Faculty Mentor: John Kaltner
Department of Religious Studies

Serpent-handling sects of the Southern Appalachian region emerged in the early 1900s and have persisted for nearly a century despite their high-cost worship practice of handling venomous snakes. Most of the congregations have about 20 members and most congregations are confined to the Southern Appalachian region, yet these independent sects have continued to persist and develop. This analysis investigates the reasons as to why these sects persisted despite several challenges. This work will reveal how the theological framework and biblical grounds used to legitimize the practices have aided in the sects' survival. Finally, to display the resilience of these sects, the analysis looks at the variety of obstacles the sects have overcome during their history. Some of these obstacles include legal barriers and the death of sect leaders due to snakebites. Finally, this paper examines how contemporary education on serpent-handling sects is creating an increased tolerance of their worship practices. The resilience of the sects in the face of adversity as well as the strong theological framework reveals that these sects are equipped for survival and will continue to persist throughout the twenty-first century.

2:20-2:40 **A Study of Contemporary Buddhism in the Community**

Monica Tam
Faculty Mentor: Mark Muesse
Department of Religious Studies

My research topic is on differences of contemporary Buddhism in America relative to traditional Asian Buddhism. This analysis will not only focus on the changes and variations from traditional Buddhism, but also how Western religions have influenced these religions. I plan to visit Buddhist temples in the Memphis area and to further explore my topic by interviewing certain members of the local Buddhist community. In contrast, I will also interview individuals from other religious backgrounds to gain insight on their opinions of Buddhism in America. The project will be put together into a short documentary, using the footage of my interviews and a short presentation. The project will relate my discoveries on the views that contemporary Buddhists have of other religions, their view of Western religious influences, and their views on traditional Buddhism. In this process, I hope to gain a greater understanding of the evolution of Buddhism in America and its role in American religious diversity.

Humanities Oral Presentations – Session 2B

302 Clough, beginning at 1:30 pm until 3:10 pm

Session Chair: Amanda Irwin, Department of Modern Languages and Literatures

1:30-1:50 **Los intelectuales y el pueblo se encuentran: el diálogo del arte en la revolución**

Sarah Lunceford
Faculty Mentor: Eric Henager
Department of Modern Languages and Literatures

Este trabajo aplica la Teología de la Liberación al discurso del papel del escritor en la revolución latinoamericana. El trabajo enfoque en la idea de diálogo, presentado por dos autores latinoamericanos, Gustavo Gutiérrez y Paulo Freire. Más específicamente, el trabajo compara la idea de diálogo en la Teología de la Liberación latinoamericana con tres autores latinoamericanos: Mario Benedetti, Heberto Padilla, Jorge Luís Borges, y Julio Cortázar. Por la investigación de la experiencia y obra de estos autores, el trabajo demuestra que la Teología de la Liberación puede proporcionar un modelo para la interacción entre el arte y la política en la América Latina.

Este modelo se considera aun más en un discurso de la política actual en México. Un estudio de la actividad y falta de actividad en la comunidad literaria cerca del conflicto político reciente en el estado de Oaxaca revela cambios importantes en la cultura literaria. Por una investigación de los periódicos y discursos públicos que responden a la política en Oaxaca, el trabajo presenta un ejemplo moderno del diálogo revolucionario.

1:55-2:15 **El ayuntamiento de dos bestias carnívoras: el comportamiento entre los hombres y las mujeres en la literatura hispánica**

Rachel Waterfill
Faculty Mentor: Eric Henager
Department of Modern Languages and Literatures

Power-driven men who control their female counterparts is a theme that the following novels share*: Album de familia* by Rosario Castellanos, *La familia de Pascual Duarte* by Camilo Jose Cela, and *El balneario* by Carmen Martin Gaite. The male characters are presented to be impulsive and self-absorbed while the female characters strive to maintain their sanity in a world which they cannot control. These texts are centered on the concept of the family and examine the different roles that the men and women play. The men serve as the breadwinners and the dominant role, while the women are subservient housewives who serve as objects, not people, to obey the husband and satisfy his sexual desires. However, these authors examine well the thoughts and feelings of these women who strive to free themselves from the traditional role where society has put them. The household serves as the center of interaction, and it is where the majority of the conflict takes place. Through a variety of perspectives and locations, these works provide a glimpse into the world of dysfunctional relationships and the different forces that influence its male and female characters.

2:20-2:40 **El desarrollo del donjuanismo en aspectos temáticos y lingüísticos**

Amelia (Amy) Ross
Faculty Mentor: Eric Henager
Department of Modern Languages and Literatures

El tema de Don Juan ha sido significativo durante muchos siglos en la literatura española. Generalmente, el Don Juan es un seductor con deseo sexual que les hace promesas a mujeres confiadas. Diferentes obras subrayan diferentes aspectos del carácter de Don Juan. Los cambios lingüísticos pueden explicar algunos aspectos del desarrollo del donjuanismo. En la misma manera l yuxtaposición de tres obras semejantes sobre un mismo tema crea una manera para investigar las lingüísticas más profundamente. Esta investigación se trata de la evolución y el desarrollo del donjuanismo en tres obras de tres épocas diferentes: *El burlador de Sevilla* (1630) de Tirso de Molina, *Don Juan Tenorio* (1844) de José Zorrilla y *Don Juan en Chapultepec* (1997) de Vicente Leñero. Para cada obra, me enfoco en dos o tres momentos semejantes que definen la obra como ejemplo del donjuanismo y voy a comparar las diferencias y semejanzas entre ellas. Más específicamente, me enfoco en momentos de seducción del carácter de Don Juan. Comparo la retórica del lenguaje de seducción en estos momentos de las obras. Ligüísticamente, me enfoco el los origines de las palabras interesantes. Desarrollo comentarios comparativos no solo sobre cuestiones lingüísticas sino también sobre ciertos cambios temáticos que sobresalen al hacer tal lectura.

2:45-3:05 **The Importance and Study of the Spanish Language Today**

Betsy Duckett
Faculty Mentor: Eric Henager
Department of Modern Languages and Literatures

Currently in the United States, more than 12% of the population can be considered Hispanic. Now more than ever, being able to speak Spanish in the United States is a necessity, rather than an advantage. The ability to communicate in this rapidly spreading language is important to increase

one's success in the business world and expand one's knowledge culturally. All of the significant, primary leaning of a language begins in the classroom. In order to evaluate the focus of learning in Spanish classes, three different level classes were observed at Rhodes College. Through this observation, it is apparent that lower level Spanish classes lack a focus on conversation, and strictly stick to basic vocabulary, verb tenses and conjugation. Although there are specialty classes in business and conversation occasionally offered to students, more attention needs to be given to these areas in order to achieve long-term, success in knowing the Spanish language and effectively communicating in it.

Humanities Oral Presentations – Session 2C

102 Clough, beginning at 1:30 pm until 3:10 pm

Session Chair: Katheryn Wright, Department of Modern Languages and Literatures

1:30-1:50 **A Culinary Transition: Hungarian Cuisine from Communism to Democracy**
Deborah Rogers
Faculty Mentor: Katheryn Wright
Department of Modern Languages and Literatures

The culinary tradition carries an important weight in the cultural makeup of the Hungarian population. Living in Budapest for four months created a curiosity in me as to why. Pursuing my interest in Hungarian cuisine through cooking lessons and the friendship of Hungarian women, it became clear that the Hungarian culinary tradition maintained importance in its demonstration of Hungary's political and economic transition in 1989. The political transition from Communism to Democracy and the opening of Hungary's economy directly manifested itself in dietary shifts. Through these shifts, the culinary tradition serves as a testament to the political and economic transition currently being experienced by Hungarians today.

1:55-2:15 **The *Botellón* and the Ongoing Transition to Democracy in Spain**
John Schranck
Faculty Mentor: Katheryn Wright
Department of Modern Languages and Literatures

With the death of Franco in 1975 came the end of a forty-year dictatorship and the beginning of a Democratic Monarchy in Spain. The new government has fostered considerable political and social freedom, from the vote to the uncensored press. But in a country with virtually no democratic precedent, the transition to democracy has been neither instantaneous nor uncontroversial. One practice which has developed over the last twenty-five years and which raises questions about the boundaries of civil liberty is the *botellón*, an informal, outdoor gathering in which young Spaniards socialize over drinks. In the early years, these gatherings usually involved a small groups of friends, but more recent *botellones* have filled the plazas and boulevards of every major city in Spain with thousands of youths. Whereas proponents argue that the *botellón* is a harmless social practice which makes good use of Spain's fair climate, critics counter that because of increased underage drinking and unabated disturbance of the peace, the *botellón* should be made illegal. Taking my personal experience in Seville with the *botellón* as an example, my oral presentation explores in depth this polemic practice. The project defines the phenomenon itself and examine its ramifications on the sociological and political transition to democracy in Spain.

2:20-2:40 **The Political Consciousness of Argentines as a Result of Past Genocide**
Ginger Thompson
Faculty Mentor: Katheryn Wright
Department of Modern Languages and Literatures

The Dirty War, which began in Argentina in 1976 and lasted until 1983, was a period of heightened government paranoia that led to the capture and torture of thousands of people

suspected of being possible insurgents and rioters. Based on little or no evidence supporting people's involvement in conspiracy against the government, the Argentine military regime in control during the time kidnapped thousands of people off the street and tortured them in concentration camps throughout the country. Those who were kidnapped came to be known as "los desaparecidos", which means "the disappeared". Although the Dirty War ended in 1983, its effects are still poignantly felt today, and memories of the war greatly influence current Argentine thoughts on politics and the government. Argentines of today, as a result of the atrocities committed nearly thirty years ago, are very politically active and educated. They believe that taking an active role in politics is the best way to prevent future governments from abusing their powers and exploiting the people. After spending time in Argentina, it became apparent to me that the genocide of 1976-1983 is still very much alive today in the people's actions, thoughts, and memories.

2:45-3:05 **Xhosa Circumcision: A Communal Rite**

Alexandra M. Boyd
Faculty Mentor: Katheryn Wright
Department of Modern Languages and Literatures

The initiation process is a community-wide responsibility that almost all Xhosa people celebrate and respect. In many ways, the process can be seen as both the basis and the perpetuation of the structure of the Xhosa society. Thus, this rite has great effects on both the initiate and the community. While much of the current international and national discussion about the initiation process concerns the physical risks involved in the process, almost all of the Xhosa people that I interviewed, during my study abroad sojourn in South Africa, were in favor of continuing the initiation processes as it is a vital aspect of preparing their youth to preserve the traditions of their people.

Humanities Oral Presentations – Session 3A

313 Clough, beginning at 3:00 pm until 4:50 pm

Session Chair: Gail P. C. Streete, Department of Religious Studies

3:00-3:50 ***Apatheia* to *Askesis*: A Re-Evaluation of Self-Mastery**

Lauren Marks, Demetria Worley, Michael Turco, John Hurd
Faculty Mentor: Gail P. C. Streete
Department of Religious Studies

Ascetic behavior is an important component in the transition from the cultural influences of Greco-Roman antiquity to the period of formative Judaism and emerging Christianity. Significantly, this ascetic strain continues in Christendom throughout the medieval period and is integral in demarcating Judaism and Christianity. This panel will explore such ascetic behavior as resistance to and transformation of dominant political and cultural systems

4:00-4:50 **"The Blood of the Martyrs Is Seed"**

Sarah Brooks, Harrison Hibbert, Alexander Liu, Kaitlin Yeoman
Faculty Mentor: Gail P. C. Streete
Department of Religious Studies

How does one transform death into victory? How does one overcome the fear of death? The Grec Roman philosophical ideal of the "noble death," exemplified by Stoic writers in particular, advocate rational affirmation of death as a rebellion against the hostile powers of the temporal world. In its re to, adaptation and transformation of this ideal, Judaism at times incorporated fidelity to the Law as t supreme exercise of reason, rewarded by God. Within this matrix, Christianity developed its idea of martyrdom as becoming like Christ in a paradoxical conquest of death through "dying for God."

Natural Science Oral Presentations – Session 1A

Frasier Jelke A, beginning at 1:00 PM until 2:30 PM

Session Chair – Brent Hoffmeister

1:00-1:15 **PLANET SEARCH: Determining Characteristics of Pulsating White Dwarfs and Subdwarfs through Observation**

Hallie E. Graves
Faculty Mentor: Shubho Banerjee
Department of Physics, Rhodes College

Nearly all main sequence stars collapse as their gravitational force overcomes the outward pressure at the end of their fuel-burning lives. White dwarfs and subdwarfs are two types of these incredibly dense non-burning remains. Some observed white dwarfs and subdwarfs have been found to change intensity over a regular period of time, and careful study of these pulsating stars can provide new information about the interiors of these stars and more importantly- about the existence of orbiting planets around these stars. Locating orbiting planets around these aged stars is crucial in finding and characterizing other solar systems.
In this study, aperture photometry was used to examine the intensity of certain stars thought to be variable over a set exposure time. Fourier transforms were performed on reduced data to determine if there were any frequency peaks. A known white dwarf pulsator, G226-29, was observed for over 20 hours and analyzed to provide more information on the characteristics of the star's pulsations and more accurately define its period.

1:15-1:30 **Computer Modeling Jovian Aurorae and Spacecraft Shielding**

Bradford Taylor
Faculty Mentor: Brent Hoffmeister
Department of Physics, Rhodes College

With President Bush's call for advancement in space exploration, the importance of the space sciences is at a level unseen since the 1960's. Current research on the outer planets of the solar system relies heavily on unmanned spacecraft equipped with instruments delicate enough to collect data, but protected enough to survive the harsh solar wind. Thus the validity of any data obtained by these million-dollar machines requires adequate appropriate shielding from radiation. Computers are used to model the solar wind's effect on certain set-ups of shielding. These models are analyzed to create designs for the best spacecraft for data collection and long-term survival. Once data is acquired they must be analyzed using computer programs to allow interpretation. The data collected from the rarely seen Jovian Aurorae from 2000 had to be processed so the images collected would be manually cleaned of graphical glitches and positioned into what is called a 'data' cube. These data cubes can then be used to obtain information about Jupiter such as surface wind speed, wavelength of emitted rays, etc. In this talk I will explain how I formed the data cubes and modeled the radiation simulation and what can be gained from my work.

1:30-1:45 **Establishing Orbits Between Two Charged Spheres in Weightlessness**

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

In August 2006, a team of students from Rhodes College performed an experiment in microgravity aboard NASA's specialized C-9B aircraft known as the "Weightless Wonder." The goal of the experiment was to establish an orbit between two electrically charged spheres. The similar forms of Newton's Law of Gravitation and Coulomb's Law suggest that such electrostatic orbits are possible. However, to our knowledge, an electrostatic orbit has not previously been demonstrated. This presentation will describe our experiment and show video footage of the electrostatic orbits that we achieved in weightlessness.

1:45-2:00 **High Spin States in the A~100 Region**

Jenna Smith[1], Justin Hugon[1], Justin LeBlanc[1], A. Heinz[2], J. R. Terry[2], H. Ai[2], R. J. Casperson[2], R. Lüttke[2], E. A. McCutchan[2], J. Qian[2], B. Shoraka[2], E. T. Williams[2]
Faculty mentor: Deseree Meyer[1]
Department of Physics, Rhodes College[1], and A.W. Wright Nuclear Structure Laboratory, Yale University[2]

In the A ~ 100 region, the nucleus can change suddenly from vibrational to rotational in character. In March 2007, we performed an experiment at the Wright Nuclear Structure Laboratory at Yale University to study one of these nuclei. We populated high spin states in 100Pd using the reaction 12C+92Zr → 100Pd + 4n. We used four different beam energies (66 MeV, 68 MeV, 70 MeV, and 75 MeV), provided by the 20 MV ESTU tandem Van de Graff accelerator at Yale University. High spin states in other neighboring nuclei were populated as well, such as 101Pd. A quick analysis of part of the data revealed three gamma ray transitions in 101Pd that have not been previously published. Data collection, experimental details, and preliminary results will be presented. During Summer 2007, the data will be analyzed more completely.

2:00-2:15 **Characterization of Human Cancellous Bone Tissue Using Ultrasonic Backscatter**

David Johnson
Faculty Mentor: Brent Hoffmeister
Department of Physics, Rhodes College

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 were processed at each point using a newly designed parameter: Time Slope of Apparent Backscatter (TSAB). 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 a highly significant linear correlation to TSAB at 7.5 and 10 MHz, indicating that this parameter may have future clinical uses.

2:15-2:30 **Calibration and Creation: Utilizing Old X-Ray Machines for Simulant Development**

Paul Sinclair
Faculty Mentor: Brent Hoffmeister
Department of Homeland Security and the Department of Physics, Rhodes College

Explosive simulants are “fake” explosives: inert non-toxic compounds which mimic the properties of real explosives under Explosive Detection System (EDS) scanning. Their development is driven by the need for safe and cost-effective means to train personnel and test new EDS’s deployed at ports throughout America. The team I worked with over the summer of 2006 as part of my Department of Homeland Security Scholarship was tasked with developing a new set of more accurate simulants for use with the next generation of machines currently in development. The primary machine the team used for measuring the simulant compounds gave several invalid readings just before I joined. The goal of my research project became to determine why certain simulants produced false readings in the earlier generation machine, and to use these results to improve detection techniques with future machines.

Natural Science Oral Presentations – Session 1B

Frasier Jelke B, beginning at 1:00 PM until 2:30 PM

Session Chair – Rosanna Cappellato

1:00-1:15 **Adeno-Associated and Lentivirus-Based Genetic Manipulations of Hippocampal CA1 Neurons *In Vivo***

John Gehrig[1], Robert Richardson[2], and Stanislav Zakharenko[2]
Faculty Mentor: Jay Blundon[1]
Department of Biology, Rhodes College[1], Department of Developmental Neurobiology, St. Jude Children's Research Hospital[2]

Physiological assessments of *in vivo* synaptic activity in the mouse brain have recently become possible with the development of foreign genes that express activity-sensitive indicators. Attenuated viral vectors are effective tools for manipulating foreign gene expression in individual neurons. Although recent studies indicate lenti, adeno-associated, rabies, and other viral particles may be used to deliver genes of interests to individual neurons, comparative studies of these viruses in the same preparation have not yet been done. In this study we chose to test levels and time courses of green fluorescent protein (GFP) expression in CA1 pyramidal neurons of mouse hippocampus using lentiviral vectors under control of neuron-specific (synapsin and - calcium/calmodulin-dependent protein kinase II) promoters and adeno-associated viral vectors under the control of a more ubiquitous (CMV) promoter. Two-photon laser scanning microscopy was used to acquire high resolution images of CA1 neurons in brain slices 2-8 weeks post injection in 6-8 week old mice to characterize the viral expression levels and time course of expression. We found that *in vivo* GFP expression transduced by lentivirus under control of synapsin developed fastest and was more robust. Future studies will involve determining the optimal expression density and then using the lentiviral vectors to deliver genes of interest into CA1 neurons for studying their electrophysiological properties.

1:15-1:30 **H_2O_2-p38 MAPK Induced Protection from Calcium-Induced Proteolysis in Ventricular Myocytes.**

Aaron T. Creek[1] and Polly A. Hofmann[2]
Faculty Mentor: Jay Blundon[1]
Department of Biology, Rhodes College[1], Department of Physiology, University of Tennessee Health Science Center, Memphis, Tennessee[2]

Ischemia-reperfusion (I/R) induced calcium (Ca^{2+}) overload results in activation of calpain-1 in the heart. Calpain-dependent proteolysis contributes to myocardial dysfunction and cell death by attacking the sarcomeric structural protein desmin. Ventricular myocytes treated with H_2O_2 prior to an I/R event exhibit decreased desmin cleavage. We hypothesize that ventricular myocytes which undergo Ca^{2+}-overload will also demonstrate a calpain-dependent disruption of desmin that could be reduced by the H_2O_2-p38 MAPK cascade of events. This study presents a cellular model of I/R that mimics Ca^{2+}-induced increase in calpain activity and subsequent proteolysis of desmin, just as it has done in whole-heart and biochemical assays. This study also demonstrates that H_2O_2 can protect from calpain-dependent degradation of desmin by means of activating p38 MAPK. Analysis of viable myocyte cytosolic fraction post Ca^{2+}-challenge shows an increase in released desmin, substantiating that desmin release is not solely a consequence of necrosis. With calpain inhibited, desmin is preserved and there is no degraded product. To show that H_2O_2 is a protective agent and that it must go through p38 MAPK to be effective we utilize a p38 MAPK-inhibitor. Applications of this study include further understanding of the events of cardiac necrosis and drug manipulation in clinical settings.

1:30-1:45 **Role of the vIL-10 Protein of Epstein-Barr Virus in Establishing Viral Latency in a Mouse Model**

Kimberly A. Green[1] and Jeff Sample[2]
Faculty Mentor: Gary Lindquester[1]
Departments of Biology, Rhodes College[1], Department of Biochemistry, St. Jude Children's Research Hospital[2]

The Epstein-Barr virus (EBV) causes mononucleosis during the lytic infection of humans, but it is its ability to establish long-term latency that makes it a potential oncogenic pathogen. Some viruses, including EBV, express proteins that are homologous to those involved in regulating the immune system within the host. EBV encodes a homolog to the human interleukin 10 (IL-10) called vIL-10. In this study, the vIL-10 gene from EBV has been isolated and inserted into a murine gammaherpesvirus (MHV) via cotransfection. By infecting mice with the recombinant MHV (rMHV), we are aiming to explicate the role of vIL-10 in viral infection, pathogenesis, and latency *in vivo*. The preliminary study indicates little or no effect of the vIL-10 gene with regard to splenomegaly, splenocyte counts, or latent virus titer. However, 3 of the 6 mice infected with rMHV for 10 days or more died, presumably as a result of infection. Studies are underway to confirm the initial findings and determine the cause of mortality in rMHV infected mice.

1:45-2:00 **Dosimetric Correlation of Skin Toxicity in Pediatric Sarcoma Patients Receiving Radiation Therapy**

Kelly Hoth[1] and Matthew Krasin[2]
Faculty Mentors: Ann Viano[3] and Jay Blundon[1]
Department of Biology, Rhodes College[1], Department of Radiation Oncology, St. Jude Children's Research Hospital[2], Department of Physics, Rhodes College[3]

Pediatric sarcoma patients often receive radiation therapy for local control. Unfortunately, radiation can be deleterious to the healthy tissues adjacent to the target volume, leading to acute effects including radiation dermatitis. The initial 82 patients on an institutional IRB approved prospective study at St Jude Children's Research Hospital were included to investigate the relationship between maximal grade of skin toxicity and demographic and clinical variables including race, absolute neutrophil blood count (ANC), chemotherapy, and area of skin irradiated. Radiation dermatitis was graded weekly during treatment and at subsequent follow-ups using the NCI Common Toxicity Criteria 2.0 (CTC) and correlated with radiation dosimetry and other demographic and clinical variables. Areas of skin treated above 40 Gy resulted in a statistically significant higher overall grade of skin toxicity compared with areas receiving lower doses. Caucasian race also predicted for a higher grade of skin toxicity compared to other races. Findings suggest dose and race may be used in the clinical setting to predict patients at risk for skin toxicity. Early intervention in this group of patients may help reduce or eliminate radiation-induced skin side effects.

2:00-2:15 **Neural Circuits Mediating Nursing Analgesia in Neonatal Rats**

Teresa Bell
Faculty Mentors: Jay Blundon[1] and Matthew Ennis[2]
Department of Biology, Rhodes College[1], Department of Anatomy and Neurobiology, University of Tennessee[2]

Analgesia is elicited in both human and rat neonates after nursing. This is brought about by two separate mechanisms, a gustatory component and an orotactile component. In this study, we used immunocytochemical detection of the protein product of the immediate early gene *c-fos*, Fos, to identify brainstem neurons activated by intraoral sucrose infusions and sucking in rat pups. In the first part of the study we found that taste analgesia resulting from the intraoral sucrose infusions elicited Fos expression in the first two relays in the ascending gustatory system, the nucleus of the solitary tract (NST) and the parabrachial nucleus (PBN), and in two sites implicated in opioid

analgesia, the periaqueductal gray (PAG) and rostroventromedial medulla (RVM). These findings disclose a candidate circuit underlying sucrose-induced, opiate receptor-dependent analgesia: (1) sucrose-responsive NTS and PBN neurons project to PAG and (2) PAG neurons activated by sucrose then project to RVM. We also examined Fos expression in pups allowed to suckle from an anesthetized dam for 40-45 min, or placed in contact with the anesthetized dam for an equivalent period but not allowed to suckle. Suckling elicited Fos expression in several brainstem sites involved in pain processing and descending nociceptive modulation.

2:15-2:30 ***KAP114* and *YLR004C* impact G1 Cyclin Cln3 Dependent Viability in the Budding Yeast *S. cerevisiae*; a Link Between Protein Localization and Cell Cycle Regulation**

Sarah E. Mercer
Faculty Mentor: Mary E. Miller
Department of Biology, Rhodes College

In *Saccharomyces cerevisiae*, Cln3/Cdk28 is a cyclin/cdk complex which functions to support cell cycle progression by triggering the transcription of genes associated with the G1 phase of the cell cycle. Previous work has shown that Cln3 must be present in the nucleus of the cell to support this progression. The Nuclear Localization Signal of Cln3 is exceedingly important in its necessary movement into the nucleus. In trying to identify those proteins which play a role in transporting Cln3 into the nucleus, 80 genes were screened to discover those possibly involved with the import of Cln3. Of these, 11 genes were implicated as having some involvement in importing a reporter fusion protein consisting of the Cln3 NLS and the Green Fluorescent Protein (GFP). *KAP114*, a gene which codes for a karyopherin responsible for several nuclear import events, and *YLR004C*, a gene coding for a protein of unknown function, were among the genes identified as involved in Cln3 NLS dependent movement of GFP into the nucleus. Viability assays with full-length Cln3 have been performed to determine the physiological relevance of what was seen using the GFP reporter. Data will be presented that indicates that both *kap114* and *ylr004c* impact Cln3 function in vivo.

Natural Science Oral Presentations – Session 2A

Frasier Jelke A, beginning at 3:00 PM until 4:30 PM

Session Chair – Chris Seaton

3:00-3:15 **Computer Simulation of Lipid Bilayers**

John Kirkham
Faculty Mentor: Shubho Banerjee
Department of Physics, Rhodes College

Cell membranes are extremely important because they control input and output to the cell. These cell membranes are bilayers of lipid molecules with a hydrophilic head group on the edge and a hydrophobic tail group on the inside. A component of understanding how cell membranes function, is to understand how the head groups interact with one another. When some of these lipids are placed in vivo, they form a structure known as the hexagonal phase. By studying why this phase is formed, we attempt to understand the interaction of the headgroups. We wrote a C++ program to simulate lipid headgroups in the hexagonal phase and compared it to lipid headgroups in the planar phase. This talk will discuss the program algorithm, its results and current improvements that we are making to the simulation.

Effect of Biological Fluid Absorption on Lamellar Structure of UHMWPE

Drew Scott[1], Sanjay Mishra[2], Warren Haggard[3]
3:15-3:30 Faculty Mentor: Ann Viano[1]
Department of Physics, Rhodes College[1], Department of Physics, University of Memphis[2], Department of Biomedical Engineering, University of Memphis[3]

Ultra-high molecular weight polyethylene (UHMWPE) is the preferred polymer for use in total hip replacement joints due to its nonreactivity in the body and resistance to wear. Although UHMWPE is very resilient to wear, sub-micron particles may fracture off of the prosthesis during normal use. It has been shown that these particles elicit defensive mechanisms from the body, leading to osteolysis and often failure of the implant. The focus of this project is to understand the effects a biological environment has on the microscopic structure of the polymer. We investigated the alignment of crystalline features, lamellae, in the polymer as a function of environmental conditions. To simulate conditions found in the human body, samples of UHMWPE were submersed in saline and artificial synovial fluid. Fluid absorption was monitored for both loaded and unloaded samples (loaded to simulate the condition of an implant in the body) by recording the weight increase of the sample. Changes in crystallinity and molecular structure were examined by atomic force microscopy, thermal analysis, and infrared spectroscopy to better understand the effects of biological fluids at a molecular level.

3:30-3:45 **Confirmation of 0^+ States in ^{152}Sm**

Justin LeBlanc[1], D. A. Meyer[1], R. F. Casten[2], C. R. Fitzpatrick[2,3], G. Graw[4], D. Bucrescu[5], J. Jolie[6], P. von Brentano[6], R. Hertenberger[4], H.-F. Wirth[7], T. Faestermann[7], S. Heinze[6], J. L. Jerke[2], R. Krücken[7], M. Mahgoub[7], O. Möller[6], D. Mücher[6], and C. Scholl[6]
Faculty Mentor: Deseree Meyer
Department of Physics, Rhodes College[1], Wright Nuclear Structure Laboratory[2], Yale University[2], University of Surrey[3]; Ludwig-Maximilians-Universität[4]; National Institute of Physics and Nuclear Engineering[5]; Universität zu Köln[6]; Technische Universität[7]

The nucleus is often thought to be a sphere located in the center of the atom. In fact, the atomic nucleus may have varying shapes that are directly correlated to its mass and energy. As the nucleus acquires more energy, its particles become excited to different energy states, and these excited states directly contribute to nuclear shape deformation. Fundamental excitations of the nucleus are often characterized by their 0^+ spin and parity. Because very little is known about the nature of these fundamental excitations, a study of 0^+ states in the rare earth nuclei was performed. These data were acquired following the reaction $^{154}\mathrm{Sm} + \mathrm{p} \rightarrow {}^{152}\mathrm{Sm} + \mathrm{t}$, using the Q3D magnetic spectrograph at the University of Munich MP tandem accelerator laboratory. A confirmation of the collaboration's results will be presented in the context of shape phase transitions in the rare earth region.

3:45-4:00 **A Statistical Look at the Language Development of Children that are Deaf/hard of Hearing in Oral Programs**

Edith Garrett
Faculty Mentor: Chris Mouron
Department of Mathematics, Rhodes College

Language is a means of communication often taken for granted as an innate skill that individuals easily acquire. However, the development of language and speech in the deaf/hard of hearing population is complicated by an inability to use auditory processes essential in the development of language skills. The acquisition of language becomes laborious for many in the deaf/hard of hearing population. Despite difficulties, many educational theorists stand behind the notion that deaf/hard of hearing children have the potential to attain and maintain language skills. I will discuss my analysis of standardized language test scores taken from two different school

populations consisting of children who are deaf/hard of hearing. I will elaborate on the statistical evidence that shows an overall trend of improvement in language comprehension among these student populations. Lastly, I will discuss how certain student characteristics, such as age at which individual was diagnosed with a hearing deficit, gender, and age at which the test was taken effect test scores and improvement.

4:00-4:15 **Mathematical Modeling of a Biological System**

Ross Dawkins
Faculty Mentors: Chris Seaton and Gary Lindquester
Departments of Mathematics and Biology

Mathematics is an essential part of the quantitative analysis of scientific experiments. Without it, science would be a guessing game. However, while statistics provides conclusive evidence, other types of mathematics provide very useful tools for hypothesizing. Differential equations can be formed to model a particular system, allowing one to predict, without experimentation or observation, how the system will work. Though models are not perfect replicas of their systems, they do provide beneficial information that may otherwise not be easily accessible. I employ a classic model to show how differential equations can be used to model a biological system. For my research purposes, I have been motivated by experiments with gene regulation to study the -galactosidase pathway in E. coli. Specifically, I am considering the behavior of the enzyme product formation following pathway induction. I hypothesize that I can use biological assumptions to write an accurate model for the system. This model can then be tested with experimentation.

4:15-4:30 **Sensitivity to Initial Conditions and Its Relationship to Chaotic Behavior in Functions**

Anthony Berry
Faculty Mentor: Christopher Mouron
Department of Mathematics and Computer Science, Rhodes College

Chaos, in mathematics, refers to the unpredictable nature of certain functions which occurs when their output is used as their next input. These functions are considered chaotic because they often move points that were previously close together surprisingly far apart, a phenomenon known as sensitivity to initial conditions. For example, suppose you had a sewing machine, and you wanted to sew a line of thread down the center of a sheet of fabric. You took the sheet, positioned the machine at its center, and let it go. When the machine finished, the result was exactly what you expected: a sheet of cloth with a single line of thread sewn down the middle. You then took the cloth and positioned it exactly as before, expecting to see two lines of thread sewn close together. However, to your surprise, you pull from the machine a sheet with three lines dividing the cloth into fourths. What you would have just witnessed was a sewing machine that was sensitive to initial conditions.

I intend to discuss this mathematical phenomenon through the example of the tent map function as well as verify its existence in a function that is differentiable except at a finite number of points.

Natural Science Oral Presentations – Session 2B

Frasier Jelke B, beginning at 3:00 PM until 4:15 PM

Session Chair – Mauricio Cafiero

3:00-3:15 **Immunogenicity of Multiple Vaccine Vehicles for Vaccination against Influenza B Virus**

Loren Haynes Kleimeyer
Faculty Mentor: Darlene Loprete
Department of Chemistry, Rhodes College

The strength and type of immune response can vary based upon the vehicle used to deliver the antigen of interest. Groups of BALB/c mice were inoculated with one of three vaccine vehicles expressing the hemagglutinin (HA) of B/Yamagata/166/98: inactivated (IIV), live-attenuated (LAIV), or plasmid DNA administered either intramuscularly (HA DNA im) or using the gene gun (HA DNA gg) to assess their relative efficacy. Serum collected 21 days after two inoculations apart was assessed using hemagglutination-inhibition and ELISA specific for both IgG1 and IgG2a. The IIV and LAIV vaccines induced high titers of both IgG1 and IgG2a, the HA DNA gg group induced intermediate titers to IgG1, and the DNA im group induced little measurable antibody. The mice were then challenged with the B/Yamanashi/166/98 virus and lungs were removed for titration of virus 3 days later. Immunity stimulated by the HA DNA im vaccine did not prevent infection, resulting in infection of 3 out of 3 (100%) of the mice, with mean titers of 10^5 $TCID_{50}$, while 0 out of 11 (0%) of the IIV, LAIV and HA DNA gg mice were infected, indicating protective immunity. We conclude that neutralization by IgG1 is necessary for protection against influenza B virus

3:15-3:30 **Neurotransmitters in serial cerebrospinal fluid samples of patients with Medulloblastoma**

Amy Wells
Faculty Mentor: Loretta Jackson-Hayes
Department of Chemistry, Rhodes College

Patients who undergo treatment for medulloblastoma (MB), generally including surgery, risk-adapted craniospinal radiation, and chemotherapy, are at a high risk for late occurring neurocognitive deficits. MB treatment has been associated with these neurocognitive deficits as well as abnormal neural development of certain structures. Other diseases and disorders that manifest neurocognitive deficits similar to those observed following MB treatment have been shown to have a neurochemical etiology. Our laboratory has developed a method to quantify neurotransmitter and metabolite concentrations in MB patient serial cerebrospinal fluid (CSF) samples to determine if these deficits in MB have a neurochemical etiology. Our data suggest patient neurochemical profiles change with therapy.

3:30-3:45 **Dispersion-Bound Ligands in Hydroxylase Enzymes**

Meghan Hofto
Faculty Mentor: Mauricio Cafiero
Department of Chemistry, Rhodes College

Phenylalanine hydroxylase (PheOH) and Tyrosine hydroxylase (TyrOH) catalyze the conversion of phenylalanine and tyrosine into a series of biologically important compounds. These compounds can then inhibit the metabolism of phenylalanine by docking in the active site of PheOH. Using second order Moller Plesset theory (MP2) and several Density Functional Theory methods (DFT), we are able to estimate the contribution of dispersion and electrostatic interactions between the substrate and one residue in the active site (Phe254) to the total substrate/protein interaction energy. Mutations in Phe254 are then studied; the results for one mutation, F254I, agree with an observed loss of function in the enzyme. This allows us to predict

additional mutations that may also cause a loss of enzymatic function. Binding and positioning of the cofactor tetrahydrobipterin (BH4) in the active site is also necessary for the function of both hydroxylase enzymes. Several *in silico* mutations in the active sites (Phe300 and Phe309 in TyrOh and Phe254 and Tyr325 in PheOH) show a decrease in enzymatic function. We examine the interactions between the wildtype and mutant residues and BH4 using MP2 and DFT methods to determine the amount of binding due to dispersion and electrostatic interactions in the aromatic residues.

3:45-4:00 **The Chemistry of Paper**

Lori Culberson and Barbara Gordon
Faculty Mentor: David Jeter
Department of Chemistry, Rhodes College

A series of experiments were conducted to determine whether the addition of enzymes into a de-inking washing system increases brightness more substantially than using surfactants alone. The purpose of deinking is to increase the brightness and other optical characteristics of reusable printed materials. Surfactants are made of hydrophilic and hydrophobic components, making them ideal for ink removal from cellulose fibers through washing. The results of these experiments lead to the conclusion that enzymatic washing deinking yielded greater brightness than using surfactants alone.

In addition to these tests, the strength of paper was experimentally determined. Hydrogen bonding is the most important contribution to paper strength, and therefore the best way to increase strength is to assist the formation of hydrogen bonds. In dry-strength testing, the most common way to do this is by adding dry-strength additives. Because hydrogen bonds are water sensitive, the addition of water to a dry paper sheet will cause a weakening of fiber-fiber hydrogen bonds and therefore a dramatic loss in paper strength. Wet strength can be improved through the addition of chemical additives, known as “wet-strength resins.” Three separate experiments were conducted evaluating the effects of additives on paper strength.

4:00-4:15 **DEVA: An Online Media Center**

Tobias O'Leary and S-K Wright
Faculty Mentor: Robert England
Department of Mathematics and Computer Science, Rhodes College

The demand for availability of online video and audio is a growing phenomenon in our culture. Web-based applications such as YouTube, iTunes, and Pandora enable immediate and easy media access. The Computer Science senior seminar project, a Dispensary of Electronic Video and Audio (DEVA), aims to provide the Rhodes community with similar access to the Rhodes Media Center's collection.

DEVA is an intuitive tool for students and professors to explore an online audio/video library. Using this system, professors are able to reserve audio/video materials, just as they reserve books in the library. This talk will describe constraints and problems we encountered in the design and implementation of this large computer-based system and the solutions we have developed.

Natural Sciences Posters

Frazier Jelke Lobby, beginning at 1 pm until 4:30 pm

Presenters will be available at their posters from 2:30-4:00 pm unless otherwise noted in their poster.

Experimental and Theoretical Challenges of Creating Electrostatic Orbits in Weightlessness

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

In January 2006, a team of students from Rhodes College was awarded flight time aboard NASA's specialized C-9B aircraft known as the "Weightless Wonder" to perform an experiment in microgravity. This experiment demonstrated a prediction of Coulomb's Law that two oppositely charged spheres should orbit each other under certain conditions. However a number of issues complicate this demonstration such as polarization effects (which affect the nature of the inverse square law and thus the stability of orbits), fluctuations in the microgravity conditions, and the effects of air pressure and humidity on charge leakage. This poster will illustrate how we resolved these issues to successfully perform our experiment.

In Vitro Biocorrosion of Titanium by Macrophage Cells

Danielle Mueller
Faculty Mentors: Ann Viano[1] and Joel Bumgardner[2]
Department of Physics, Rhodes College[1], Department of Biomedical Engineering, University of Memphis[2]

The in vivo performance of biomedical implants, including their longevity, is partly determined by the corrosion they experience in the harsh biological environment. Macrophage cells are central to healing, and it has been suggested that they affect corrosion because they release reactive oxygen species (ROS) when stimulated as in the healing process. This study evaluates how macrophage cells affect the corrosion of Titanium, a common implant alloy, by monitoring the electrochemical behavior of the metal during exposure to and activation of these cells. One side of a titanium plate was exposed to cell culture media possibly containing TIB mouse macrophage cells, and measurements of electrical potential and current were taken in this modified electrochemical cell every six hours for a total of nine days. Cells were added on day three and stimulated on day six to release ROS. The corrosion rate, which is derived from the electrical measurements, shows a significant decrease over time, which is attributed to growth of the surface oxide layer on the metal. The decline in corrosion rate is less in the presence of activated cells, suggesting that the ROS hinder the oxide growth. This implies that corrosion in vivo will be enhanced by cellular activity and care must be taken when choosing material for an implant to ensure that any enhancement in corrosion be offset by gains in other material properties.

Yucca and UREX+: Options for Spent Nuclear Fuel

Whitney Tidwell
Faculty Mentor: Carol Ekstrom
Department of Physics, Rhodes College

Recently the United States government has shown interest in expanding our nuclear energy capabilities. Nuclear energy does not produce the greenhouse gases associated with burning fossil fuels, however, it produces a solid waste that remains radioactive for thousands of years and has potential for harm if released into the environment. Currently the Department of Energy is researching two different plans for keeping the public safe from nuclear waste: store the spent fuel in a geological repository until its radioactivity reaches a safe level, or remove for reuse the most radioactive components of spent fuel, then store the less radioactive leftovers in a repository. Currently, the Department of Energy is considering Yucca Mountain as a candidate for storing nuclear waste. The Department of Energy is also funding research for spent fuel reprocessing, which would remove usable uranium or plutonium from waste that would otherwise be sent straight to a repository. This poster investigates the environmental and economic complications of storing nuclear waste at Yucca Mountain and of reprocessing spent nuclear fuel.

Red-Bellied Woodpecker, *Melanerpes carolinus,* Abundance and Habitat Use in Overton Park

Lauren Bartling, Emily L. Smith, and Elizabeth Erny
Faculty Mentor: Rosanna Cappellato
Department of Biology, Rhodes College

Red-bellied woodpeckers are residents of a vast majority of the middle and eastern United States, living in a variety of forests as well as suburban areas. They have expanded their area for about 100 years because of their non-selective habitat requirements, though they tend to prefer older growth forests. Within each population, the abundance of this species is increasing, making them more prevalent. Many red-bellied woodpeckers find their habitat and nest in a variety of different tree species. They forage within their habitat, using their bill to gather insects from bark, probe and excavate wood, and to grasp the bark. In our research red-bellied woodpeckers are counted in Overton Park in Memphis, Tennessee on two separate transects measuring 300 feet in length each. Observations along the transects are made in order to determine habitat preference of the red-bellied woodpeckers when foraging. Also, this survey may serve as a baseline assessment of the number of red-bellied woodpeckers in this area of Overton Park, which can then be used by later studies in order to determine the changing abundance of the species.

The Effect of Habitat Area on Bird Species Diversity in Memphis City Parks

Sarah Beeson, Jacy Gentry, and Ben Halbrooks
Faculty Mentor: Rosanna Cappellato
Department of Biology, Rhodes College

Birds are commonly considered both indicator and keystone species for a wide variety of habitats, holding great ecological significance. The positive correlation between species diversity and habitat area, expressed in the equation $S = cA^z$, has been validated by a number of research studies using bird species diversity counts. We hypothesize that our findings will reflect an increase in bird species diversity as park area increases. Other studies have confirmed that bird species diversity increases as habitat area increases, sampling a variety of habitats in urban environments, including woodlots, city parks, and forest islands. We will survey five Memphis parks of small, medium, and large areas using strip transects. Using visual and, to a lesser extent, auditory counts, birds will be standardized per km for a fixed period of time. Data will be analyzed using the Shannon-Weiner and Simpson Diversity Indices, graphed to determine the correlation between park size and bird species diversity, and displayed in Rank Abundance Graphs. Research so far confirms our hypothesis that species diversity increases with area. The calculation of bird species diversity has been instrumental in choosing hot spots for environmental protection.

Soil Respiration in Forested versus Non-forested Urban Areas in Memphis, TN

Adam Bohnert
Faculty Mentor: Dr. Rosanna Cappellato
Department of Biology, Rhodes College

Though the importance of forests in sequestering atmospheric carbon has been well detailed, other processes, such as soil respiration, must also be considered in order to achieve a fuller understanding of carbon cycling in forests. This research aimed to clarify the dynamics of soil respiration in forest and non-forest soils. Soil respiration rates were measured in and around the old-growth forest of Overton Park, Memphis, TN, during Fall 2006. Measurements were taken inside of the forest within a previously established plot as well as outside of the forest on a spread flanking a nearby roadway. Analysis of these data showed a clear difference in the mean soil respiration rates for the forest (42.62 mg CO_2-C/m^2/hr) and non-forest (119.92 mg CO_2-C/m^2/hr) soils. A two-sample T-test confirmed that this difference is statistically significant ($p = 3.02 \times 10^{-5}$). Preliminary regression analyses indicated a significant relation between an increase in respiration rates and environmental variables such as soil temperature and soil moisture. These findings underscore that the forest does contribute to decreased carbon loss through reduced soil respiration and that soil respiration is positively associated with both soil temperature and moisture.

Mapping the Invasive Plant species of Overton Park

Joseph Bynum, Aaron Creek, Sinifunanya Nwaobi, Daniel Lombardo
Faculty Mentor: Rosanna Cappellato
Department of Biology, Rhodes College

Ivy, privet, and trifoliate orange are three invasive plant species that have never been sufficiently mapped in Overton Park, Memphis, Tennessee. Having a detailed map will provide means for an assessment of extermination methods, as well as give other researchers useful information characterizing the lifecycle of invasives. This study's examiners measured 25 meter transects of the park, using GPS to mark patches of ivy and individual specimens of privet and trifoliate orange. The data were then plotted using GIS techniques, revealing patterns of invasion by the three species in question.

The Economic Value of Overton Park and its Effects upon Conservation Efforts

Courtney Cockerell, Kimberly Godwin, Alison Lohse
Faculty Mentor: Dr. Rosanna Cappellato
Department of Biology, Rhodes College

Expanding commercialization and increasing population have a significant impact on urban forests such as Overton Park in Memphis, Tennessee. This research attempts to assign an economic value to the park by measuring peoples' willingness to pay for its conservation. The assignment of an economic value to the park facilitates the generation of effective conservation policies. People using Overton Park for recreation as well as faculty/staff at Rhodes will be surveyed. We hypothesized that users will be willing to pay more to conserve the park than non-users. Also, users with higher incomes are expected to pay more for conservation than those with lower incomes. These hypotheses will be tested using the travel-cost method and willingness-to-pay analysis. Based on previous research done on this topic, we expect the data collected to demonstrate that there would be a willingness to pay for the conservation of Overton Park within the Memphis community.

The Activity of the Budding Yeast G1 Cyclin Cln3 in the Absence of Genes Primarily Associated with mRNA Export

Tyler C. Cullender
Faculty Mentor: Mary E. Miller
Department: Biology, Rhodes College

The cell division cycle is a highly regulated process that involves the interpretation of molecular signals in the growth and division of eukaryotic cells. Passage through cell cycle "Start" in the growth 1 (G1) phase requires the activity of cyclin proteins to irreversibly commit a cell to division. In *Saccharomyces cerevisiae,* commitment to cell division in late G1 is regulated by the cyclin dependent kinase (Cdk) Cdc28 and its interactions with a bound cyclin protein subunit, Cln3. The Cln3 cyclin/Cdc28 complex initiates the transcription of genes important for cell cycle progression. The activity of the cyclin-Cdk complex is conditional on its *RAN*-dependent movement into the nucleus. Failure of Cln3 to achieve nuclear localization may result in defective progression of the cell cycle. Close to fifty percent of the genes recognized as important to proper Cln3 nuclear localization signal activity have functions that relate to mRNA nuclear export (*NPL3, MFT1*, *THP2*, *SKY1*, and *NUP84*). To address the physiological relevance of this class of genes in Cln3 function, we have assayed the ability of full length Cln3 to support viability in the absence of these genes. The possible implications of mRNA nuclear export in relation to Cln3 function will be addressed.

A Broad Spectrum High-Copy Suppressor of Calcofluor Hypersensitivity in *Aspergillus nidulans*

Ryan Dagen and Crystal Phelps
Faculty Mentors: Terry W. Hill and Darlene M Loprete
Departments of Biology and Chemistry

In filamentous fungi, as in yeasts, hypersensitivity to the chitin-binding agent Calcofluor White (CFW) is correlated with defects in cell wall integrity. In the course of identifying genes affecting CFW resistance and sensitivity in the fungus *Aspergillus nidulans*, we have observed that overexpression of a gene for a novel

membrane protein, designated AN4897, can compensate for the gene defects in a range of mutant strains, in which AN4897 itself is not mutated. Thus, AN4897 acts as a high-copy suppressor of these gene defects, indicating that the function of AN4897 (still to be established) has something to do with the regulation of cell wall integrity. In order to further investigate the range of suppressor function of AN4897, we have systematically cloned extra copies of the gene into a range of CFW-hypersensitive strains and have assayed the transformants' ability to tolerate exposure to CFW. At least partial complementation of CFW hypersensitivity was observed in seven out of thirteen strains tested. These results confirm early indications that AN4897's suppressor effect is wide-ranging, though not universal. We are proceeding under the hypothesis that all those genes whose mutant phenotypes are suppressible by overexpression of AN4897 function in a common pathway affecting cell wall integrity.

The Importance of *NUP2* and *NUP188* in the G1 cyclin Cln3 Activity in *Saccharomyces cerevisiae*

Mary Landon Downs
Faculty Mentor: Mary E. Miller
Department of Biology, Rhodes College

The cell cycle is the series of events that culminates in the division of two cells. Enzymes called cyclin-dependent kinases (Cdks) are central components of the cell cycle control system. Cyclin protein bind to, activate, and confer functional specificity to Cdk. G1 cyclins are required to coordinate cellular growth with entry into a new cell cycle. The G1 cyclin of interest for our work, Cln3, must be localized to the nucleus for the proper progression of the cell cycle and contains a nuclear localization signal (NLS). Deletion of the Cln3 NLS causes Cln3 accumulation in the cytoplasm, and a loss of Cln3 activity. Cln3 moves into the nucleus through the nuclear pore in an energy dependent manner that requires the Ran protein. In a previous experiment, a GFP reporter screen showed that *NUP2* and *NUP188* were important for Cln3 NLS activity. Studies have shown that *NUP2* is involved in nucleocytoplasmic transport, binding to either the nucleoplasmic or cytoplasmic faces of the nuclear pore depending on Ran-GTP levels. *NUP188* is involved in the structural organization of the nuclear pore and of the nuclear envelope. The goal of my work is to determine the role these genes may play in Cln3 function.

Distribution of *Acer negundo* in Relation to Past Environmental Disturbance

Keller Bankston, Stephanie Juchs, and Kacie Ross
Faculty Mentor: Rosanna Cappellato
Biology Department, Rhodes College

In 2001 and 2002, Park Friends Inc. started spraying to control kudzu (*Pueraria lobata*), an invasive vine found in Overton Park's Old Growth Forest. Previous to spraying, the kudzu became so pervasive that many old growth trees were lost due to a lack of sunlight. After spraying, new growth occurred in these areas due to the opening in the canopy. In these areas *Acer negundo* (box elder) seems to have replaced old growth trees. Though native to Tennessee, *Acer negundo* is a very hardy species capable of out-competing other native species. However, there is limited support in primary literature to link *Acer negundo* distribution with disturbed areas. We attempted to establish this relationship by overlaying current map displaying *Acer negundo* distribution to maps of the areas sprayed for kudzu. Core samples were also taken to demonstrate whether the trees were established in 2001/2002, the period of disturbance.

Analysis of *Asimina triloba* (Pawpaw) Rate of Growth Over Time in Undisturbed and Disturbed Habitats of Overton Park (Memphis)

Akram Knefati, Sina Nezakatgoo, Susannah Schwartz
Collaborator: Christina Campion
Faculty mentor: Rosanna Cappellato.
Department of Biology, Rhodes College

Our study was conducted in Overton Park, a forest located in the central region Memphis, TN. Our goal was to compare growth rates of *Asimina triloba* (pawpaw) trees growing in disturbed versus undisturbed habitats in the park. Several factors were considered in determining disturbed and undisturbed habitats, such as presence of invasive species and edge effects. Using a tree coring device, we were able to determine the ages of the pawpaw

trees by counting the rings in the tree cores. Pawpaw in a disturbed region of the park showed a growth rate of 1.2133 cm per year (N=20, R^2=0.8994). Pawpaw in an undisturbed region of the park showed a growth rate of 0.4964 cm per year (N=20, R^2=0.8794). A two sample t-test assuming unequal variances indicated that growth rates in the disturbed region were significantly greater than those in the undisturbed region ($p<.05$).

Production of Murine Herpesvirus (MHV) Recombinant Containing the MHV gp150 Promoter Without the Epstein-Barr Virus Interleukin 10 gene

Megan McKenna
Faculty members: Gary Lindquester
Department of Biology, Rhodes College

The Epstein-Barr (EBV) virus is one of the most common human viruses, occurring worldwide (CDC, 2006). One gene that EBV encodes is a homolog to the human interleukin 10 gene (IL-10), but the role of this homolog (known as vIL-10) in viral pathogenesis and latency is still unknown. Although experiments with EBV are limited due to its narrow host range, murine gammaherpesvirus 76 (MHV-76), a naturally occurring variant of MHV-68, has a similar pathogenic profile and can be utilized as a model for EBV. We are currently using MHV-76 to help identify vIL-10's effect in latency and pathogenesis. Previous experimentation has successfully yielded a recombinant that contains a vIL-10 gene driven by the MHV gp150 gene promoter. The purpose of this project is the generation of a revertant virus, one in which the inserted gene is then removed, to be utilized as a control in *in vivo* experiments. The revertant was generated by homologous recombination after transfecting culture cells with a plasmid containing wild-type sequences and recombinant MHV-76 viral DNA. The resulting revertant virus was purified through several rounds of dilution analysis and screening for the absence of vIL-10 sequence by PCR and confirmed through DNA sequence analysis.

A Gene Encoding COG4 Complements a Cell Polarity Defect in the Filamentous Fungus *Aspergillus nidulans*

Sarah Mercer and Claire Litherland
Faculty Mentors: Terry W. Hill and Darlene M. Loprete
Departments of Biology and Chemistry, Rhodes College

Polarized growth in filamentous fungi is established during the late stages of spore germination, when, after an initial phase of isotropic spore swelling, all subsequent growth and wall deposition is focused upon a single point on the cell surface. In a search for novel genes affecting morphogenesis in filamentous fungi, we have produced a collection of mutants in *Aspergillus nidulans*. One of these mutants, RCH-67, exhibits a temperature-sensitive inability to establish a point of permanent polarized growth, though growth at permissive temperature is essentially wild type. We have identified two genomic DNA fragments, each of which fully complements the defective phenotype of the RCH-67 mutation. We have cloned three out of the eight possible rescuing genes included in these two fragments. Of these, only gene AN7462 complements the phenotype. This gene encodes a protein that is orthologous to the yeast COG4 (Component of Oligomeric Golgi Complex 4), which is involved in ER-to-Golgi and intra-Golgi transport. We have determined that there is a genetic lesion in the mutant strain's allele of AN7462 at amino acid 780, truncating the terminal 53 amino acids of the protein.

KAP114 and *YLR004C* Impact G1 Cyclin Cln3 Dependent Viability in the Budding Yeast *S. cerevisiae*; a Link Between Protein Localization and Cell Cycle Regulation

Sarah E. Mercer
Faculty Mentor: Mary E. Miller
Department of Biology, Rhodes College

In *Saccharomyces cerevisiae*, Cln3/Cdk28 is a cyclin/cdk complex which functions to support cell cycle progression by triggering the transcription of genes associated with the G1 phase of the cell cycle. Previous work has shown that Cln3 must be present in the nucleus of the cell to support this progression. The Nuclear Localization Signal of Cln3 is exceedingly important in its necessary movement into the nucleus. In trying to identify those proteins which play a role in transporting Cln3 into the nucleus, 80 genes were screened to discover those possibly involved with the import of Cln3. Of these, 11 genes were implicated as having some involvement

in importing a reporter fusion protein consisting of the Cln3 NLS and the Green Fluorescent Protein (GFP). *KAP114*, a gene which codes for a karyopherin responsible for several nuclear import events, and *YLR004C*, a gene coding for a protein of unknown function, were among the genes identified as involved in Cln3 NLS dependent movement of GFP into the nucleus. Viability assays with full-length Cln3 have been performed to determine the physiological relevance of what was seen using the GFP reporter. Data will be presented that indicates that both *kap114* and *ylr004c* impact Cln3 function in vivo.

Abundance And Distribution Of Freshwater Mussels In The Chipola River Below The Dead Lakes In Gulf County, Florida With Focus On The Chipola Slabshell, *Elliptio chipolaensis*

Cianna Pender
Faculty Advisor: David H. Kesler
Department of Biology, Rhodes College

Historically, 33 species of freshwater mussels have been observed in the Apalachicola–Chattahoochee-Flint Basin, which resides in Georgia, Alabama, and Florida. The fourth largest river in this basin, the Chipola River, was dammed in 1960 just below the Dead Lakes in Florida, only to be removed in 1987. The location immediately downstream from the removed dam is a very productive site for *Elliptio chipolaensis*, the Chipola slabshell. This species is thought to be endemic to the Chipola River. It is currently listed as threatened by the U.S. Fish and Wildlife Service (USFWS), and critical habitat along the Chipola River is coming under protection by the USFWS. In the summer of 2006, a concentrated survey effort on the Chipola River below the former dam at the Dead Lakes yielded over 70 individuals of *E. chipolaensis*, showing significant congregation at a particular location. The length-frequency curves for these individuals suggest recruitment. Other species, which are considered stable by the USFWS, were found in alarmingly low numbers during the survey.

Prox1 is a Critical Regulator of Pancreatic Organogenesis

Caroline Sartain[1], Gamze Kilic[2], Natasha Harvey[2], and Guillermo Oliver[2]
Faculty Mentors: Mary Miller[1], Beatriz Sosa-Pineda[2]
Department of Biology[1], Rhodes College, Department of Genetics and Tumor Cell Biology, St. Jude Children's Research Hospital[2]

The homeodomain transcription factor Prox1 is broadly expressed throughout mouse embryogenesis, and its function is critical for proper development of various organs, including the pancreas. Lack of Prox1 has been shown to affect several events in early pancreas organogenesis, such as branching morphogenesis, islet cell formation, and exocrine differentiation. However, the early lethality of $Prox1^{-/-}$ embryos prevented the study of the protein's role in overall pancreas organogenesis and homeostasis. To address these questions, we inactivated Prox1 function specifically in mouse pancreatic progenitors using a conditional knockout approach. Immunohistochemical analysis of embryonic, juvenile, and adult pancreata revealed various anomalies, including altered exocrine/endocrine cell ratios and decreased organ size. Adult mice showed a progressive deterioration of the pancreatic tissues that resulted in massive loss of exocrine cells, infiltration of adipocytes, islet neogenesis, changes in gene expression, and in some mice glucose intolerance. Overall, these alterations indicate that Prox1 activity is critical for proper formation and homeostasis of this organ. Future studies on Prox1 function in the pancreas will investigate whether the loss of Prox1 function is linked to predisposition for pancreatic diseases. Additionally, mouse modeling will be used to investigate the participation of other genes in homeostatic or disease processes.

Do Freshwater Mussels form a Growth Ring Every Year?

William Sheftall
Faculty Mentor: David Kesler
Department of Biology, Rhodes College

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 (± 0.10 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.

Protein – ligand Interactions in Hydroxylase Enzymes: DFT and *ab initio* Results

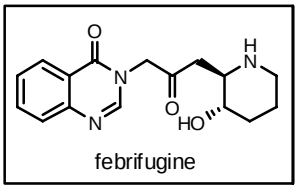
Jessica Cross and Meghan Hofto.
Faculty Mentor: Mauricio Cafiero
Department of Chemistry, Rhodes College

In this work we examine the suitability of using Density Functional Theory (DFT) methods to calculate the electronic interaction energies between aromatic amino acid residues in protein active sites and various aromatic ligands. Our model systems include the enzymes Phenylalanine Hydroxylase (PheOH) and Tyrosine Hydroxylase (TyrOH); mutations in these enzymes can cause symptoms of Phenylketanuria and Parkinson's disease, respectively. We calculate the counterpoise corrected interaction energies using several DFT methods, and MP2, with the 6-311++G(d,p) basis set. We find that several DFT methods are able to provide qualitatively and quantitatively correct results for the aromatic interactions. We also perform point mutations on the enzymes and predict loss of protein function based on decreased interaction energies.

Studies Directed Toward the Synthesis of a Potential Antimalarial Agent, Febrifugine

Lane Lovett
Faculty Mentor: Julie Cong-Dung Le
Department of Chemistry, Rhodes College

Malaria affects almost 40% of the world's population and an estimated of 1.5 – 2.7 million people die a year from this tropical parasitic disease. A key contribution to the widespread affect of this disease is due to the increasing resistance to standard antimalarial drugs. Although many current research programs focus on controlling malaria, the discovery of new drugs remains important in order to treat the disease. Antimalarial drug discovery has two main goals, identifying effective drugs and making the drugs affordable because most of the infected population lives in underdeveloped countries. Febrifugine is an alkaloid isolated from the leaves of the hydrangea plant, and has 100 times the antimalarial activity of quinine. In this study, a short and efficient synthetic route of febrifugine was designed, and modern organic chemistry was used in the preparation of febrifugine analogues for biological evaluation.



febrifugine

Characterization of Two GDP-mannose Transporter Gene Null Strains in *Aspergillus nidulans*

Stuart Martin and Ravi Patel
Faculty Mentor: Loretta Jackson-Hayes
Department of Chemistry, Rhodes College

Our laboratory has been studying two putative GDP-mannose transporters genes (MT1 and MT2) in the filamentous fungus *Aspergillus nidulans* because they appear to be involved in maintaining the integrity of *A. nidulans* cell walls. Attempts to create a MT1 null strain resulted in transformants that were not viable suggesting that MT1 is an essential gene. We created two MT2 null strains by replacing the MT2 gene with the *pyr4* gene through homologous recombination. The two strains display two different colonial phenotypes. MT2 is present once in the *A. nidulans* genome, but obtaining two different strains suggests alternate *pyr4* insertion in the two null strains. We used Southern blot to determine the number of *pyr4* insertions in the two MT2 null strains. Further analysis will show whether *pyr4* inserted randomly or if MT2 is actually present at multiple sites in the genome. We are also interested in the expression of the MT1 and MT2 genes during developmental stages of the fungus, so it is important to be confident that there is only one MT2 gene present in the genome when designing experiments to compare expression of MT1 and MT2.

Rapid Air Sampling of Explosives Using Virtual Impaction and Solid Phase Microextraction

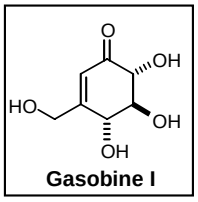
Sydney Milton, Jaala Spencer, and Derek Pegram
Faculty Mentor: Jon Russ
Department of Chemistry, Rhodes College

The goal of our study is to create a rapid air sampling system to detect trace amounts of explosives for operation in locations such as Iraq to combat the growing problem of improvised explosive devices (IEDs). Our focus is creating an effective system to eliminate airborne particles from air samples, prior to analysis for trace explosives such as TNT, RDX, and PETN. For this, air is drawn through a virtual impactor, which separates the molecule analytes from particulate matter such as sand, dust, and smoke. To test the virtual impactor (VI), we built a wind tunnel that allows us to simulate the open-air environments in which we expect the device to be deployed, and to direct air into the VI. Solid phase micro-extractors (SPMEs) are used in the VI to simultaneously concentrate and extract trace amounts of target compounds, for example, 2,4-DNT, which is the main degradation product of TNT. Such compounds absorb onto the surface of the SPME fiber at ambient temperatures, and are then desorbed in the gas chromatograph (GC) for analysis by mass spectrometry or electron capture detection (ECD). Using this method, we can detect < 6ppb (or < 5×10^{-12} g) 2,4-DNT with GC-ECD.

A New Approach to the Synthesis of Gabosine I, a Precursor to α-Glucosidase Inhibitor

Ke Qi
Faculty Mentor: Julie Cong-Dung Le
Department of Chemistry, Rhodes College

α-Glucosidase is one of the enzymes released from the small intestines involved in the break down of complex carbohydrate into simple sugar subunits. As a competitive inhibitor for α-glucosidase, α-glucosidase inhibitor acts to interfere the substrate/enzyme binding mechanism; therefore, prevents the break down of carbohydrates, decreases the absorption of carbohydrates, which leads to the decrease in blood sugar level. In the case of patients with Type II diabetes, α-glucosidase inhibitor can decrease immediate blood glucose level in the short term and it can reduce the hemoglobin$_{A1C}$ level in the long term. In this study, a synthesis for gabosine I, a precursor to α-glucosidase inhibitor, was designed. Gabosine I could be biosynthesized from various strands of *Streptomyces* cultures, but its preparation from 1-o-methyl-glucopyranoside could possibly amplify the efficiency and quantity of the compound for further biological studies.



Gasobine I

Social Sciences Oral Presentations – Session 1A

108 Buckman, beginning at 1:00 pm until 2:45 pm

Session Chair – Nick McKinney

1:00-1:15 **From Anecdotes to Analysis: Racial Profiling in Memphis Traffic Stops**

Timothy R. Pruitt, Jr.
Faculty Mentor: Charles McKinney
Departments of History and Political Science

Racial profiling has been at the heart of a larger historical conflict between the police, their policies, and the disproportionate affects these policies have on people of color. These pre-existing tensions have been agitated over the past few decades due to allegations of increased racial profiling. The term "profiling" was first adopted by the United States Drug Enforcement Agency (DEA) as a means to identify characteristics of potential drug traffickers during the late 1970s. As these characteristics trickled down through state and local agencies, the profiling became distorted. Officers began to target Black and Hispanic male drivers and used relatively minor traffic violations as a pretext for searches of their person and/or vehicle. This practice had a negative affect on public opinion. The phenomenon had become so common that it was labeled "driving while black" or "driving while brown." Pressure from communities of color has lead to the development of national awareness resulting in anti-profiling legislation. The Tennessee General Assembly passed Public Chapter 910 in 2000. Public Chapter 910 created a one-year pilot project in which law enforcement agencies voluntarily collected vehicle stop data. The Memphis Police Department was one of the 44 Tennessee Police Departments that volunteered for this pilot program

1:15-1:30 **The Factors that Influence Criminal Sentencing**

Ben Lambert
Faculty Mentor: Nick McKinney
Department of Economics and Business

This paper analyzes the different factors that influence the length of criminal sentencing. By using over seventy thousand observations from federal court cases disposed in 2003 I analyze the affects that age, race, gender, attorney type, etc. have on the amount of time a defendant in a criminal will be sentenced to.

By using a dataset from the Federal Justice Statistic Resource Center, I targeted the main influencing factors that lead to the severity of criminal sentencing. Targeting defendants in different types of criminal cases, different regions of the country, and different criminal histories I also analyzed how their demographics and pasts influence how they will be sentenced. Results of sentencing are used to determine what factors are the most influential in determining the amount of time a defendant in a criminal case will serve.

1:30-1:45 **Financial Services for the Poor: The Effects of Micro-savings on the Operational Sustainability of Micro-finance Institutions**

Lizzie Phillips
Faculty Mentor: Nick McKinney
Department of Economics and Business

Winner of the Nobel Peace Prize in October 2006, Muhammad Yunus pioneered the practice of providing financial resources to the poor in an attempt to eradicate poverty. The buzz about micro-finance as a development panacea calls into question how Micro-finance Institutions (MFIs) can most effectively structure operations to meet the poor's demand for financial services. While most MFIs tend to focus on credit, this article examines the impact of micro-savings on the profitability of 682 MFIs worldwide over an eight year period (1998-2006). Savings programs not only help clients protect their profits and build wealth, but they can also

serve as a main source of funding for MFIs, thus increasing an institution's sustainability. By using general financial and outreach indicators and institutional data provided by the Mix Market, a global micro-finance information exchange, I use regression analysis to test the relative impact of voluntary and mandatory savings programs. Results indicate that savings programs enhance the operations of MFIs by promoting sustainability thereby suggesting that micro-finance programs should provide opportunities for clients to save.

1:45-2:00 **The Red Scare: Understand the fear towards China and the Apathy towards India**

Lisette Lipscomb
Faculty Mentors: Nick McKinney and Teresa Beckham Gramm
Department of Economic and Business

In today's economic environment, China is receiving a lot of attention because, it is believed, that they will take over the world economically. India, however, does not receive nearly the same treatment even though the two countries have many similarities, at least on the surface. Using regression techniques similar to those presented by Barry Bosworth and Susan Collins in their 2006 paper, I analyze the difference in the causes of the economic growth of both countries to help explain the different reactions to the two countries economic growth.
A total of four different regressions will be run on the data. For each country, one regression will be run on GDP growth while the other will be run on GDP per capita growth. I chose to run two regressions on each country because I wanted to see if there were different causes for GDP per capita growth and GDP growth. The data used for the regression was obtained from the WDI database developed by the World Bank covering the period from 1970 to 2004.

2:00-2:15 **The Effects of Immigration on Wages in US Cities**

Meredith Huddleston
Faculty Mentor: Nick McKinney
Department of Economics and Business

It is only in recent years that the economic impact of immigration has been seriously explored; a good deal of this research has focused on the effect of immigrants coming into the United States, considering the large numbers entering the country both legally and illegally. Many believe, as basic economic models predict, that immigrants, or anyone for that matter, entering a labor market will lower wages. However, most studies have found that immigration is associated with wages that are either higher or statistically the same as wages in places with no immigration. After years of research, there is still evidence for both sides as to whether immigration affects wages and whether the effect is positive or negative. In my project, I examine the effect of immigration on wages across metropolitan statistical areas in the United States using data from the US Census Bureau. I model wage as a function of the educational level of the residents in said area, their experience level (here represented by median age as a proxy for experience), the industry makeup of area, the percent of the population that is foreign-born and various demographic characteristics, including race, gender, and family size

2:15-2:30 **The Prisoner's Dilemma Squared**

Stephen Howden
Faculty Mentors: Daniel Arce and Nick McKinney
Department of Economics and Business

A large amount of theoretical research has been done on social dilemmas, particularly on public goods and common-pool resource goods. Both of these goods face collective action problems known as the Prisoner's Dilemma (PD). However, there are fundamental differences between the two games which has led to the classification of different types of PD games. Almost all of the previous empirical and theoretical literature has focused on analyzing games embedded with one type of PD. Recently, Daniel G Arce and Todd Sandler published an article

called *The Dilemma of the Prisoner's Dilemmas* where the authors examined the outcomes of games in which two alternative PD games were embedded. The authors theorize that the least desirable of the two 2 X 2 PD games' Nash equilibrium is chosen. I set up an experiment to study behavior in 3 X 3 game scenarios where two types of PD (provision and commons) were present. The results show.

2:30-2:45 **Asymmetric Deadlock under Evolutionary Conditions**

Lorelei Armstrong
Faculty Mentors: Daniel Arce and Nick McKinney
Department of Economics and Business

This paper studies the application of a dynamic model to a noncooperative interaction game, Asymmetric Deadlock, with a counterintuitive equilibrium to see how the results hold under evolutionary conditions. The assumption of Nash behavior to solve conflict games can lead to 'inefficient' equilibria. In Asymmetric Deadlock, rational supergame behavior can lead to an 'inefficient' outcome compared to the unique stage game equilibria due to the fact that some agents have a comparative advantage in operating under inefficient conditions. Asymmetric Deadlock's bottom will drop out when the game is repeated causing a counterintuitive result. The application of evolutionary dynamics can resolve the Deadlock paradox by allowing for history dependent strategies capable of adaptive learning. The evolutionary model also solves for the behavioral paradox of the government's invariance to the cost of z, creating a more realistic model of strategic interaction in the Deadlock format.

Social Sciences Oral Presentations – Session 1B

110 Buckman, beginning at 1:00 pm until 2:30 pm

Session Chair – Amy Risely

1:00-1:15 **Preventing the Spread of HIV/AIDS in Developing Nations: Is Civil Society Mobilization the Key?**

Alexandra M. Boyd
Faculty Mentor: Amy Risley
Department of International Studies

Recently, the world acknowledged the twenty-fifth anniversary of the discovery of HIV/AIDS and upgraded the language used to describe the havoc it is wreaking on the global community from an epidemic to a pandemic. The developing world constitutes the largest population that is affected by this pandemic. However, this burden to development is not shared equally by all developing nations. For instance, populations in Sub-Saharan Africa have a great deal more reported infections than populations in Latin America. This dissimilarity begs to be explained in an effort to tame the rapid spread of HIV/AIDS infections within developing countries. This study examines the prospects of civil society mobilizations playing a key role in preventing the spread of infection within nations by specifically analyzing the levels of civil society mobilization and the percentage increases in reported HIV/AIDS infections within Brazil, China, and Nigeria. According to the proposed theory, high levels of civil society mobilization lead to a lower percentage increase of reported infections of the disease. Through this study, a new approach to funding the prevention of the spread of HIV/AIDS can perhaps be developed. Additionally, civil society may be seen as a more significant actor in the realm of international policy.

1:15-1:30 **The Evolution of Chinese Military Strategy: An Increasing Emphasis on Technology and Shift Towards the Navy**

Nathan Hulling
Faculty Mentor: Stephen Ceccoli
Department of International Studies

My research looks at the evolution of Chinese military ideology, strategy, and capability from 1949 to the present day. When the communists took power in 1949 and established the Peoples' Republic of China (PRC), China's military was largely outdated and lacked advanced technology and weapon systems. Therefore, the PRC relied heavily upon a large number of troops provided by its army, its geographic terrain, and its peasant population for defense and national security. Furthermore, at this time in history the PRC believed the major threat to its security and sovereignty would come in the form of invasion from either the United States or the Soviet Union. However, as time advances we can see a significant change in the structure of the Chinese military and its security concerns. Beginning in the mid-to-late 1970s, China began to focus more on increasing the capabilities of the technological sectors of its military, the navy and air force. In addition, the PRC also began to focus on new security objectives which sought to secure its periphery. Ultimately my research attributes these changes to an increase in economic capability and a change in leadership, which coincided with a change in military ideology.

1:30-1:45 **Explaining Singapore's Government Linked Corporation Stock Price Premium**

Andy Greer
Faculty Mentor: Amy Risley
Department of International Studies

Partially government-owned corporations, or firms which are both publicly and privately owned, are neither anomalies in the global economy nor confined to collectivist states. Corporations such as these, imbibing both private and government investment, have substantial effects on other businesses. Singapore, despite a corporate attitude that has led scholars and business people alike to dub the state Singapore, Inc. for its laissez-faire economic regulations and tax system, is significantly affected by the operation of these corporations. The International Monetary Fund recently found that a substantial premium on the market exists for government-linked corporations over their wholly private competitors. This premium exists after controlling for market attributes such as cash flows, industry size, price to earnings ratio, and market capitalization. If the cause(s) of the premium could be ascertained, policy makers would have a better idea of the effects of privatization of government-owned industries elsewhere. This paper tests hypotheses suggested by the varieties of capitalism approach from political economy in an attempt to explain the share price premium. The research demonstrates that the premium positively correlates with increasing degrees of strategic coordination measured by net entrepreneurial starts, union availability, union arbitrations, and the stock's beta coefficient in a particular sector.

1:45-2:00 **Law versus Life: An Analysis of the Implementation of Indigenous Rights**

Lori Rose Dowell
Faculty Mentor: Amy Risley
Department of International Studies

Since the 1970s, international awareness and advocacy on behalf of indigenous peoples have increased significantly. The UN, for instance, has sponsored two separate decades focused on alleviating the problems faced by today's indigenous communities; yet, despite these and other international measures employed to secure the rights and freedoms of indigenous groups, the implementation of these international laws often varies by country. An examination of international and national factors affecting implementation, such as the size and mobilization of indigenous groups, the level of political freedom of a country and the participation of international organizations and transnational advocacy networks (TANs), reveals that as the

levels of these variables increase, the overall implementation of indigenous rights within a country will also rise. Ultimately, this insight is particularly useful for understanding the conditions necessary to successfully achieve indigenous freedoms, but also for understanding the implementation of other types of international law, such as human rights or environmental law.

2:00-2:15 **NAFTA y los mexicanos: los efectos individuales de libre comercio (In Spanish)**

Lori Rose Dowell
Faculty Mentors: Peter Ekstrom, Eric Henager, Amanda Irwin, Michael LaRosa, Amy Risley
Department of Latin American Studies

In 1994, the United States, Canada, and Mexico entered into a most unlikely union: an economic alliance creating a free trade zone between the three countries. Critics and supporters of the plan have adamantly maintained their positions in support of or opposition to the agreement, arguing that the system will disproportionately benefit the U.S. or that it will encourage investment and economic development in Mexico, respectively. After over ten years of existence, it is obvious that in many ways the predictions of both sides have come true. Mexico has witnessed an increase in investment in businesses along the U.S. border; yet, its agricultural community has been overrun by large U.S. producers. Most significantly, the implementation of NAFTA has created and exacerbated problems at the individual level in Mexico, demonstrated most prominently by the increasing urbanization of the border, the high levels of crime accompanying this urbanization, and the changing gender roles/family lifestyles within the country.

2:15-2:30 **Understanding Violence on the United States-Mexico Border**

Peter J. Hart
Faculty Mentors: Peter Ekstrom, Eric Henager, Amanda Irwin, Michael LaRosa, Amy Risley
Department of Latin American Studies

The two thousand mile border that is shared by the United States and Mexico is much more than just a border between two nations. It is one of the most heavily trafficked trade zones, as well as the largest collision of two civilizations. This area, which is unlike any other in the world, has another characteristic: violence. The bloodshed that exists today is far more widespread and horrific than anything seen before. Crime is the primary cause, and the crime in question is almost universally centered on the drug trade. Theories abound as to why, from corruption at the highest levels of the Mexican government to the fault of the United States' and Europe's addiction to drugs. While many efforts have been undertaken to combat the problems of the flow of illicit drugs and the resulting violence, there has so far been no decrease. The questions that this problem poses are now beginning to expand beyond a simple law enforcement perspective; we must now ask ourselves if the illicit drug trade has become a cultural lifestyle not just on the border, but in the urban areas of the United States, as well.

Social Sciences Oral Presentations – Session 1C

214 Buckman, beginning at 1:00 pm until 2:45 pm

Session Chair – Julie Steel

1:00-1:15 **The Relationship between White Privilege and Collective Guilt in a Colorblind World**

Brian Baker
Faculty Mentor: Chris Wetzel
Department of Psychology

An overlooked component of racial discrimination is the role of European Americans who enjoy unearned benefits because of their skin color. This concept of white privilege is pervasive because the majority of European Americans believe that hard work is the sole determinant of one's upward mobility in our colorblind nation. By believing that one's race is insignificant, European Americans perpetuate white privilege and thereby unwittingly support racial inequality. This study investigated European Americans' responses to learning about white privilege via an educational white privilege board game. This study also examined whether increased feelings of white guilt predicted support for affirmative action programs. European American undergraduate students were tested to determine their racial attitudes and beliefs, feelings of collective guilt and awareness of white privilege both before and after participating in one of three conditions. The experimental conditions were the white privilege board game and a video about white privilege, while the control condition was the Game of Life. The results provided empirical evidence of the difficulties posed when European Americans are asked to make choices against their own self-interest.

1:15-1:30 **Implicit Allport Prejudice Test: Capturing Implicit Associations of Racial Prejudice**

Laura Arnold
Faculty Mentor: Chris Wetzel
Department of Psychology

Many times our social behaviors are driven by implicit forces that are not readily available to our conscious awareness. The goal of this study was to develop a new method for measuring implicit associations. Specifically, this study attempted to assess a variety of forms of implicit racial prejudice through the use of an associative learning paradigm in which participants were required to pair different race faces with positive and negative racially stereotypical terms. Results indicated some evidence for affective, stereotyping, and malicious prejudice.

1:30-1:45 **Does it really pay to be pretty? Attractive and unattractive-leniency in justice seeking.**

Laura Arnold, Jessica Copeland, Kelsey Knipshild, Colly Scott
Faculty Mentor: Julie Steel
Department of Psychology

Several criminal and jury-member characteristics influence verdicts and punishment allocations (Coley & McKelvie, 1993). Our study extended these findings by assessing the interactions of perpetrator attractiveness, perpetrator gender, participant gender, and type of crime committed on punishment preferences. We also assessed various justice-seeking preferences beyond traditional jail sentencing including compensatory, restorative, and retributive justice-seeking.

Participants were randomly assigned to one of four unique conditions (crossing perpetrator attractiveness by type of crime committed). Assessments included ratings of the fairness of the criminal action, jail sentence, and supplemental items including community service, counseling, apologizing, and wishing the perpetrator to suffer the same fate as the victim.

No attraction leniency effects for fairness judgments or jail sentencing appeared, but the *supplemental* justice-seeking recommendations demonstrated an interaction of attractiveness and crime type: *un*attractive perpetrators who committed property crimes actually received leniency as compared to the other three groups. Also, participants requested vengeance for attractive criminals who committed property crimes and unattractive criminals who committed person crimes more than the other two groups.

Evidently participants are not always influenced by attractiveness of a criminal when suggesting traditional jail sentencing; but the less formal forms of justice-seeking may be biased by defendant and jury characteristics.

1:45-2:00 **"In the Future I will have all Robot Friends and African American Friends": Science and the Self in Middle School Students' Stories About the Future**

Katherine Stewart
Faculty Mentor: Marsha Walton
Psychology Department

This presentation is the first round of assessment for the NASA Stars Project, an initiative taken with the schools in the Rhodes College Learning Corridor. The program is designed to address the fact that fewer and fewer of the nation's students are pursuing careers in science related fields. There are three components to the program to encourage participation and increase excitement about science: the academic component, the motivation component and the identity component. This research will focus on the identity component, which is a narrative and story-telling program called KidsTalk Science. The purpose of this research is to develop a coding manual that can reliably be used with the KidsTalk Science stories. This work will be based on a preliminary subset of stories written by middle school students. The coding manual will assess features of the stories indicating students' identification with science, and will be used with a complete data set for the final assessment of the intervention.

2:00-2:15 **Alumni Survey**

Emily Deichmann, Rebecca Smith
Faculty Mentor: Bette Ackerman
Department of Psychology

Our senior seminar class for psychology evaluated the Rhodes Vision statement in response to a request for Institutional Research, and it came to our attention that the college did not have a comprehensive alumni survey, something that would have provided data against which we could assess change. In conjunction with the Alumni Relations Office under the direction of Bud Richey, we developed a comprehensive alumni survey to 1) collect data relevant to the current practices of the college 2) addressing the data needs of the Alumni Office, 3) address and identify needs of other offices for alumni data, and 4) to assess Rhodes's impact on its alums throughout their life among many other uses in upcoming years. After only one month of working on the during the Fall 2006 semester, we realized that this survey would have a far reaching impact on the college and it became more than just a project for a senior seminar class to us. This was something the college was in need of and we could leave the college with for all that it had given us in return. After senior seminar was completed, we have sent the survey to over 7000 Rhodes alumni, gathered the results, and are in the process of assessing the information. The initial results of this have already been presented to the Rhodes Alumni Board in March as well as alumni chapters in other states and will be featured prominently in the efforts to re-accredit the College.

2:15-2:30 **Do You Feel Me! : The Effect of the Speaker's Expressed Emotion and Offering Suggestions on Persuasiveness**

Tom Watson
Faculty Mentor: Marsha Walton and Julie Steel
Psychology Department

"I am senior psychology major here at Rhodes College, and I am also a convicted felon…I hurt myself and two men as a result of my drunk-driving that night." This is an excerpt from a talk that was composed to be given to college students to assist them with an attitudinal change to stop driving drunk and to take the keys away from friends who are intoxicated. Previous persuasion research suggests that one effective technique for attitudinal change is for someone who has experienced consequences of that behavior to speak about his or her personal experience (Fors & Rojek, 1999). However, previous research does not offer clear suggestions for how emotionally –dramatic a speaker should be when giving this type of persuasive talk. Would a speaker who displays more emotion be more persuasive? In addition, past research has provided contradictory suggestions regarding whether or not the speaker should offer instructions on how to avoid consequences of the behavior. Would it be more persuasive to allow people to come up with their own method, or do people need directions? To test these questions, a persuasive talk about drunk-driving was given to college students. The speaker manipulated the level of his emotionality and whether or not instructions were provided in order to see the effects of these variables on attitudinal change. Audience members' attitude change was assessed by questionnaire. Results of this research will be presented and discussed.

2:30-2:45 **Finding Common Ground: The Similarities of Harassment Experiences Among Students from Diverse Backgrounds**

Kristina Dean, Logan Jones
Faculty Mentor: Dr. Anita Davis
Department of Psychology

Over the last decade, the college population has become a more diverse group in terms of race/ethnicity, sex, socioeconomic status, sexual orientation, religion, and political affiliation. These changing demographics should bring college students to a better understanding of individual differences and experiences. Unfortunately, segregation of minority groups remains high. This segregation phenomenon may be related to individuals' beliefs that their harassment experiences are unique compared to other diverse groups and may lead them to feel that they have little in common with students from different backgrounds. The Common Ingroup Identity Model, however, suggests that college students can create a common identity based on shared college experiences. By exploring self-reported harassment narratives of approximately 750 students who participated in an online survey on campus climate, my research will be examining the similarities of harassment experiences among diverse groups of students based on their demographic characteristics. Findings will be discussed in terms of how the Common Ingroup Identity Model can facilitate a common platform to foster an understanding of the diverse experiences of different groups of students

Social Sciences Oral Presentations – Session 2A

108 Buckman, beginning at 3:00 pm until 4:30 pm

Session Chair – Nick McKinney

3:00-3:15 **Perceptions of the Optional and Standard Program in Memphis City Schools**

Rebecca Williams
Faculty Mentor: Michael Kirby
Department of Urban Studies

There are currently 32 optional schools in the Memphis City School District, offering emphases in areas such as college preparation, creative and performing arts, aviation, travel, tourism, health sciences, banking and finance, and international studies among others. Entrance into the optional programs, specifically at certain high ranking schools within the district, can be a very complicated and controversial process. In most cases schools that are labeled optional house both an optional and a standard program. In the opinion of some, the existence of these programs can create schools within schools, with two populations being prepared for two different outcomes. Some also argue that students are treated differently, both in terms of academics and behavior, based on the program in which they are enrolled. While this study is still in progress, at this point the surveys of parents of students in the optional program yield results supporting the idea that there are perceptions of positive treatment and outcomes for students enrolled in the optional program. There are still more surveys to be completed which will provide more information about treatment and outcomes of students in the standard program.

3:15-3:30 **Predicting Test Scores: ACT v. Gateway**

Katy Buckner
Faculty Mentor: Nick McKinney
Department of Economics and Business

The following study performed will capitalize on different variables that could help further improve test results for high school students by finding an equation to predict ACT and Gateway exit exam scores. The Tennessee Department of Education website lists every year a report card for each individual county and each public school within that county. These report cards provide information varying from the number of students broken down by race to the individual schools average ACT composite score. Information for each individual county in Tennessee was found for the years of 2000 through 2006. Using all of the available variables, many different regressions were estimated trying to find the perfect equation to predict test scores. Results showed that the best predictors of ACT and Gateway exit exam scores were the percentage of economically disadvantaged students, the percentage of courses taught by highly qualified teachers, the dollar amount of system expenditure per pupil, whether it was a city or county school system, the average student body per school, and the attendance average.

3:30-3:45 **Homeschooling: An Alternative Form of Education**

Christine Mondragon
Faculty Mentor: Nick McKinney
Department of Economics and Business

Homeschoolers make up about 7% of the schooling community. These are children who's parents have chosen to teach them at home verses traditional forms of education. Little research has been formally done on homeschoolers outside of rehashing the little statistics that are available. Using survey data from a Parent Involvement survey in 2003, this article will compare homeschoolers to public and private school children. I will examine the similar and different characteristics that make up a homeschooled child, parent, and household. The article will also address parental involvement in school activities, parent and student interactions outside of class, and student non school activity involvement. There are many speculations as to why

homeschoolers continuously outperform traditionally schooled student. My research will hopefully shed some light on potential reasons as to why that difference exists, along with a better understanding of why parents choose to homeschool and what they expect to offer their children.

3:45-4:00 **The Economics of Religious Mobility**

Cassie Ortiz
Faculty Mentor: Nick McKinney
Department of Economics and Business

This article questions: what life experiences, if any, make an individual more or less likely to switch religions? My research efforts focus on identifying the economic, demographic, and social characteristics of religious converts. I pay special attention to those converts who identify themselves as individuals who once were, but no longer are, religious. I begin by analyzing the effects of certain life experiences predicted by the "religious human capital model" and "the rational choice approach to religion" to be influential factors of religious mobility. In addition to those experiences, I test my own and also the intuitions of colleagues. Using individual survey data from the 2004 General Social Survey, I find a number of statistically significant variables that decrease the likelihood of religious mobility, as well as a few that increase its likelihood. However, it is clear that these variables lack the ability to sufficiently describe the religiously mobile

4:00-4:15 **The Wright Amendment: How Southwest Airlines Still Struggles to Freely Reduce Airfares Three Decades after Airline Deregulation**

Steven Michael Josephs
Faculty Mentor: Art Carden
Department of Economics and Business

In 1979 Jim Wright, a congressman from Texas, attached an amendment to the International Air Transportation Act of 1979, which restricted passenger air traffic out of Love Field. As an attempt to shackle the new and profitable Southwest Airlines (SA) the amendment prohibited airlines operating of Love Field from flying anywhere but within Texas and its neighboring states. Although the amendment eventually inhibited SA's ability to compete freely, through a well-structured business model, top management was able to propel the airline to the dominant entity in the industry in terms of passengers carried per year. By analyzing discrepancies-in relation to when (before, after, and/or never) SA enters the market-in fare prices between airports that Southwest does and does not serve, I hope to further prove the so-called "Southwest Effect". Furthermore, given SA's success (i.e. 34 consecutive years of profits), the research will focus on discovering why SA has yet to completely obliterated the industry altogether. I intend to answer the question: Why has SA not broken into the northeastern and international markets?

4:15-4:30 **Predicting Presidential and Congressional Elections**

Reed Reynolds
Faculty Mentor: Nick McKinney
Department of Economics and Business

The fundamental interests of this paper are the impact of economic events and candidate characteristics on voter behavior. Political scientists and econometricians have used theoretical arguments as well as empirical results to predict US presidential elections. Ray Fair, a professor of economics at Yale University, is the foremost econometrician in the field. I use his vote share model as the starting point for my analysis. I build on his model in attempt to more accurately explain the results of previous elections and to predict the 2008 election.

I believe that candidates' positions on our involvement in the Middle East will be a deciding factor in the 2008 presidential election. I analyze and re-specify Fair's war variable in order to determine how this situation will impact the next election. I also add several candidate characteristic variables to the models. I look at how a candidate's political pedigree influences

his success in elections. Furthermore, the possibility exists that our first female or African American president will be elected in 2008. I create variables that assess the likelihood of this occurring.

Social Sciences Oral Presentations – Session 2B

214 Buckman, beginning at 3:00 pm until 4:15 pm

Session Chair – Tom McGowan

3:00-3:15 **The Appropriateness of Place: The personal and ethical challenges of cross cultural service and research**

Rachel Frantz
Faculty Mentor: Tom McGowan
Department of Anthropology/Sociology

The purpose of this research project is to investigate the variety of strategies social scientists and service volunteers use to work through their feelings of discomfort resulting from differences in power and status between themselves and those with whom they work. This study developed out of my own feelings of discomfort working across power structures while volunteering in Haiti, studying and researching in South Africa, and working in Memphis. Another purpose of this research is to develop my own strategy and approach for appropriately interacting with others in research and service settings. I am pursuing this topic by conducting interviews with student volunteers, volunteers in Peace Corps or Teach for America, social science professors and other professionals who address the process of negotiating difference through their work. The interviews suggest that individuals use a variety of methods to address conflicting issues of difference. Themes evident in appropriate strategies for working with difference include the importance of honesty and trust in building relationships, and the importance of constantly addressing difference in social research and volunteer environments. Although addressing the discomfort associated with work involving power and status differences is not simple, it is an essential consideration for those seeking appropriate relations with whom they work.

3:15-3:30 **Democratizing Etiquette through Play**

Anne-Marie Crifasi
Faculty Mentor: Thomas McGowan
Department of Anthropology/Sociology

Throughout my life journey of participant observation as a Southern New Orleanian white middle-class woman, I have noticed the important role etiquette plays in our society and embraced its perplexity: it not only maintains order and ritual, but most intriguingly to me, it excludes, includes, and identifies people. Through qualitative research and analysis, I have gathered information on what etiquette is, who practices it, and why. Etiquette has been defined as a source of confidence, a personal statement, a form of socialization, a means to impress, and a method of social mobility. Yet the question remains, how *does* one learn etiquette, particularly etiquette of the elite, if one does not come from the elite? By employing "play" as a learning tool, this project promotes the educating of etiquette across class lines. Using existing etiquette literature and following the work of Gadamer and Mead's internalization of play, I have created a board game that may be used to teach peoples of varied social demographics etiquette through play.

3:30-3:45 **Mining the HIV/AIDS Literature to Develop Educational Material to Combat AIDS Based Stigma**

Katy Chambers
Faculty Mentor: Thomas McGowan
Department of Anthropology/Sociology

Stigma and discrimination are among the main barriers to accessing medical treatment among people living with HIV/AIDS (PLWHA). Providers, health care workers, patients, and patients' family and friends fall victim to stigmatization, usually due to a general lack of knowledge regarding HIV transmission. This study aims to combat stigma by illuminating how physicians, consumers, and community members may interact to educate the public and improve the treatment of PLWHA.

I will develop a comprehensive literature review that may be used by research practitioners and consumer advocates to develop educational materials pertaining to HIV/AIDS. Specifically, I will use this literature review to formulate interview survey questions to be administered to consumer advocates in order to further discuss the problem of AIDS based stigma. The research conducted in this project, including the production of interview survey questions, will aid in the process of understanding how educational and social programs may be implemented to raise HIV awareness.

3:45-4:00 **Informing Diplomacy's Anthropological Blind Spot: A case study of the U.S. and Iran**

Kaveh Salehy
Faculty Mentor: Thomas McGowan
Department of Anthropology/Sociology

Almost three decades since the Islamic Revolution of 1979, diplomatic relations between the United States and Iran have remained in deadlock. For years political scientists have scrambled to comprehend the perceived illogical and extremist behavior of the pariah state, and have yet to produce guidelines necessary for a détente. In this study I explain the relationship between cultural misunderstandings and diplomatic failure and propose an anthropological informing of diplomacy that holds promise for a breakthrough. I begin the study by discussing the strengths and limitations of the constructivist paradigm in understanding the political behavior of Iran. In spite of the paradigm's crucial incorporatation of endogenous elements (i.e. culture and identity) in understanding state behavior, the model is still lacking. I inform this limitation by reconfiguring the basic misunderstandings and misrepresentations of the Iranian culture (i.e. monolithic and unchanging) that are still held today. I propose a more fluid view using Roy Wagner's clarification of the often misunderstood perspective of culture, explaining that culture is crafted through the constant manipulation of conventional symbols taken from a variety of ever-changing ideas. It is suggested that this anthropological reconfiguring may be used to pursue a fresh diplomatic approach between the U.S. and Iran.

4:00-4:15 **Using Robert Merton's Theory of Anomie In Exploring The Effects of Employment On Recidivism**

Nicholas Westbrook
Faculty Mentor: Thomas McGowan
Department of Anthropology/Sociology

This study examines Robert Merton's theory of anomie in explaining employment as a key factor in transitioning from incarceration to civilian life. Anomie can be defined as "personal unrest, alienation, and uncertainty that comes from lack of purpose or ideals." Robert Merton develops a twist to the concept of anomie and proposes five forms of social adjustment, which help people avoid the experience of anomie. Conformity, the most common form of adjustment, involves individuals pursuing their cultural goals (i.e. money) under conditions in which people have access to institutional means to achieve those goals. In contrast, innovation pertains to individuals who do not have the institutional means to achieve their cultural goals, leaving them to deviate or "innovate" their own unconventional means to pursue their goals (i.e. becoming a drug dealer to attain monetary success). My thesis is that former inmates who are able to attain employment after being released from prison, a form of conformity, are categorically less likely to recidivate than those who do not attain employment following incarceration. This thesis is tested by reviewing published findings on the effects of employment on recidivism in the United States.

Social Sciences Posters

Barret Library, entrance lobby and Middle Ground, beginning at 1:00 pm until 4:00 pm

Presenters will be at their posters from 2:00-3:00 pm unless otherwise noted on their posters

"Every Child is an Artist": The Importance of Integrative Arts Education in Elementary and Middle Schools

Olivia Brown, Mary-Catherine Burgoyne
Faculty Mentor: Debra Bartelli
Department of Psychology

The topic of art education in schools has been a source of conflict for many years. Art, as a school subject, has often been considered a supplement to other areas of study. Art intelligence is not held in the same high regard as intelligences in other subjects, such as math and science. However, proponents of art education see art as a medium through which children can learn many skills that other subjects may not teach, such as independent judgment and attention to detail. Art education has also been attributed to improvement in children's behavior and respect towards each other. The Arts Children and Teachers program in Memphis serves to bring local artists into the Memphis city schools to teach the children about a variety of areas in the field. We will be analyzing the effectiveness of this program on having short-term and long-term positive effects on the students involved in the program. We will attempt to determine if certain types of art instruction facilitate greater amounts of positive change than others. We will accomplish this by observing in participating schools, interviews with teachers and artists, and quantitative analysis of survey data collected.

Assessing Students' Encounters with Different Religious Perspectives on Campus: Does Growth and Learning Occur?

Lindsay Joe
Faculty Mentor: Anita Davis
Department of Psychology

Previous research has shown the importance of student interaction and environmental characteristics (i.e. the climate) of an institution to enable growth and learning for students (Edison, Nora, Pascarella, Terenzini & Whitt, 2001). Through student interaction and academic classes, students come across various religious views. The purpose of the research is to assess the religious climate of Rhodes College specifically focusing on students' encounters with religious perspectives both inside and outside of the classroom, students' comfort or discomfort expressing their religious views, and how these factors are related to growth and learning. The participants were approximately 1200 students who completed an online survey. Both quantitative and qualitative data are analyzed to examine these questions. The qualitative data are analyzed based on 13 coding concepts all with kappa reliability of .76 or greater. The results are presented with suggestions for ways to improve the campus' religious climate.

The Effect of Development on Poverty in Kunming, China:

Marcus Falion
Faculty Mentor: Mike Kirby
Urban Studies Program

Over the past three decades in China the number of people living in a state of poverty has been dramatically reduced, yet the majority of these people who have been alleviated from poverty are those who live in the rural areas of China. At the same time, the number of people in urban areas who live in a state of poverty has been increasing. Kunming is no exception, and the city of five million people has seen many people over the past few decades fall into a state of poverty. My research has found three different types of people who are subject to living in a state of poverty: migrant workers, the unemployed, and the disabled. Over the past five years, the city of Kunming has seen vast economic development, with new construction projects going on at all time. Millions of state dollars have been invested in many different types of capital projects. Yet at the same time the city has failed to care for those who need the most help and with the closure of state-owned factories, many low-skilled workers and those from rural areas outside the city have lost their jobs.

Desegregation and Private Affluent Schools

Becky Ferguson
Faculty Mentor: Michael Kirby
Department of Urban Studies

The 1970's were a difficult time because of school desegregation in Memphis, Tennessee. The relationship between private affluent schools and the history of desegregation is very important in further understanding desegregation. Interviews were conducted with the parents and students of three private schools St. Mary's School, Hutchinson School, and Memphis University School. Families primarily use private schools to obtain a quality education even though they realize that each school is lacking in the areas of diversity and helping to promote racial understanding. By using a program called GIS to locate a student's home zip code, it has also been found that students travel far distances to receive an education from one of these three schools, including the greater Shelby County, Eastern Arkansas and Northern Mississippi.

Lifting Voices: An Evaluation of Recidivism Reduction at SCDC

Daniel Sheppard
Erica Aquadro
Faculty Mentor: Debra Bartelli
Department of Psychology

Recidivism in the United States is a growing issue today. The expenses of incarceration on taxpayers in addition to wasted years for the incarcerated provide more than enough motivation for taking action. Several programs exist that provide means for facilitating re-entry after release by way of education, workshops, and therapy. One such program is Lifting Voices, whose main focus is the Shelby County Department of Corrections. Lifting Voices addresses target areas that increase the likelihood of recidivism, including money management, family therapy, and skills for post-release employment. The hope of the program is that by working with incarcerated females to improve their lives in these areas, recidivism rates will decrease. In order to understand the effectiveness of Lifting Voices, we will compare the data and curriculum with those of other programs. This will include an evaluation of the information from a six month follow-up interview and a thorough investigation of the different target areas addressed recidivism reduction.

The Relationship Between African American and White American Students' Experiences on a Liberal Arts Campus and Their Understanding of Their Identities

Tevari Butler, Katie Jones, Elizabeth Leake
Faculty Mentor: Anita Davis
Department of Psychology

All individuals experience identity development differently. The purpose of this study was to examine the differences between student's experiences, based on an individual's race and/or ethnicity, occurring on a small southern liberal arts college campus. Participants included 35 White American students and 5 African American students. Each participant responded to an online survey where they were asked to describe a personal experience which they believed was based on some aspect of their identity. Researchers then coded for 16 different concepts within the narratives. Concepts that were coded included: (1) recognition that some aspect of one's identity was related to the experience described, (2) the content of the experience (e.g., discrimination experienced, conflict with self or others), and (3) the location of experience. We were mainly interested in the similarities and differences between the groups regarding the concepts with in the narratives. The results concluded that there were several

Special Sessions:

Hollywood-Springdale Poster Session

Barret Library, entrance lobby and Middle Ground, beginning at 1:00 pm until 4:00 pm

Presenters will be available at their posters from 2:00-3:00, unless otherwise noted at their poster.

Session organizer and Chair, Michael Kirby, Urban Studies Program

Cypress Springdale Community Partners: Helping Hands and Changing Lives

Amanda Sakla
Faculty Mentor: Carol Ekstrom, Department of Physics (Geology)
Rhodes Learning Corridor /Hollywood-Springdale

Living on Rhodes campus, surrounded by a fence in the Rhodes "bubble," it is easy to forget the outside world. Rhodes faculty and students recognized that this was a problem, and applied for and received a COPC grant to address this problem. One of the three parts of the grant, Education/Opportunities for Youth, has been working with Cypress Middle and Springdale Magnet schools. To order to organize support and to improve communication between the schools, their adopters, the community, and Rhodes; the Cypress Springdale Community Partners (CSCP) committee was formed. The committee provides a sounding board for ideas, and a structure for implementation projects. Some of these projects include: Girls Inc. Satellite Program at Cypress, a Registration Blitz, a CSR collaborative calendar, Open Gym, an Art Internship, traffic safety improvements at Springdale, and Cypress Homecoming at Rhodes. The CSCP has built a strong community of partners that are committed to improving the educational opportunities for students in Cypress and Springdale. In addition it has provided opportunities for Rhodes students to uphold the school's vision statement in committing "to a lifelong passion for learning, compassion to others, and the ability to translate academic study and personal concern into effective leadership and action."

The NASA STARS Learning Opportunity

Sara Connaughton, Lindsay Plunk, Keturah Dunlap
Faculty Mentor: Carol Ekstrom, Department of Physics (Geology)
Rhodes Learning Corridor /Hollywood-Springdale

The limited opportunities of the students in the Memphis city public school system play a major role in the low rate of students completing high school and continuing to higher education. Few students are exposed to relatable lessons in the classroom or cannot expound on academic interests for a number of reasons. The disparity is especially apparent in the fields relating to science and math. To increase student interest in these specific fields and promote higher education, Rhodes student Ambassadors taught science and math using hands-on activities based on the NASA Stars curriculum to students attending Cypress Middle School, Snowden School, and Springdale Elementary. These lessons prepared the students for a weeklong trip to space camp in Huntsville AL. The final aspect of the program involved creating an after-school robotics program that promotes critical thinking and problem solving skills. We predict that by offering more opportunities, integrating college students into the schools, and creating after-school programs the students will show an increased interest in the sciences and higher education.

Great Strides: Cypress Middle School

Lizzie Phillips
Faculty Mentor: Carol Ekstrom, Department of Physics (Geology)
Rhodes Learning Corridor /Hollywood-Springdale

Established in the fall of 2005 with the assistance of Girls, Inc., the original purpose of Great Strides was to promote the physical and emotional development of adolescents through fitness activities and open discussion. However, over the past four semesters, the program has morphed into something much greater than the original vision. Growing in new directions to meet the changing needs of the participants, Rhodes volunteers recognized

the importance of providing new opportunities for the Cypress girls. Expanding on the original framework of relay races and discussion-based stretch sessions, we accent the Tuesday sports programs and Wednesday arts and crafts activities with excursions to Rhodes twice a month to take part in activities like a five course etiquette dinner and scavenger hunts. Just as the girls have welcomed us (the Rhodes volunteers) into their community at Cypress Middle School, we hope that these field trips will help the Cypress girls to feel comfortable where we live and work. After breaking down individual insecurities that exist on either side of Jackson, we can begin to build one community. Great Strides serves as one venue through which constructive relationships can evolve.

Tutoring Builds Community

Jennifer Phillips
Faculty Mentor: Carol Ekstrom, Department of Physics (Geology)
Rhodes Learning Corridor /Hollywood-Springdale

Springdale Memphis-Magnet Elementary School is located five minutes from Rhodes College, and, like many Memphis City Schools, is in need of math and reading tutors. Recognizing this need, several Rhodes students organized a tutoring program, partnering with the Memphis City Schools' "Our Children, Our Future", for the children in grades K-5. Approximately 20 Rhodes students now work once a week with the children, increasing skills, broadening horizons, and building friendships. I expanded the tutoring program by forming a Service Reflection Group which has met during the spring semester to discuss current education trends and to reflect on our tutoring experiences. We hope to expand our community by adding an aftercare program and more tutors.

Science Saturday: Springdale Magnet Elementary School

Anum Minhas
Faculty Mentor: Carol Ekstrom, Department of Physics (Geology)
Rhodes Learning Corridor /Hollywood-Springdale

In fall of 2004, Rhodes received a Community Outreach Partnership Center (COPC) grant from HUD, to develop a partnership with Hollywood-Springdale. One of the prime purposes of the grant was to provide more educational opportunities for the youth in the Hollywood Springdale area. To target the lack of parental interest and support for the schools, Prof. Carol Ekstrom, PI for Education, developed programs that would encourage parents to bond with their children in academic situations. I am implementing one of the programs called "Science Saturday" at Springdale Magnet Elementary School. The program enables parent/ student interaction in a fun, yet educational, environment. Twice a semester approximately 20 students, each accompanied by a family member, venture out on a science field trip in a yellow school bus. We visit local "science" locations, varying from Lichterman Nature Center to the Mississippi River. The students and their parents engage in activities such as determining pH of the Mississippi River and touring greenhouses. Through the required attendance of parents with their children, Science Saturday not only enhances and stimulates student interest in science, but also allows parent-child bonding.

Development of Safe, Drug Free Housing for Low Income Families in the Hollywood-Springdale Area

Taylor Brown
Faculty Mentor: Dr. Michael Kirby
Urban Studies Program

Last year, A New Beginning Community Organization was donated an apartment complex (60 units) located in the Hollywood-Springdale area. A New Beginning is a nonprofit founded by Cathedral of Faith Church. Rev. Calvin Booker is the Executive Director. However, the apartment complex, formerly called Howell Gardens and now called A New Place, was in severe disrepair. In addition, the complex has financial issues left over from the previous owner, including substantial back taxes and other liabilities. The goal of the nonprofit is to provide clean, affordable, crime free, and drug free homes for low income families in a community setting. In order for this to happen there have to be considerable in-kind services, contributions, and elimination of the public financial liabilities. This project describes some of these in-kind services. Church members provide free services to the project. The Rhodes Hollywood Springdale Partnership is working with the City on some of the financial issues. Neighborhood Christian Center is providing in-kind materials and United Way Housing is brokering an event that

will bring 150 FEDEX employees to the site to do rehab. Rhodes students Taylor Brown, Nathan Hulling, and Marcus Falion have organized student efforts to perform demolition work in the apartments—the first step in rehabilitation. In particular, the students have organized other Rhodes students, including members of the Greek community and the Rhodes College Football team to volunteer their time. Their demolition efforts have enabled Rev. Booker to more quickly prepare apartments for renovation without any financial costs and strengthened the bonds between Rhodes College and Hollywood/Springdale community. As a result of these efforts, 12 of the apartments are now occupied by new tenants.

Can Rezoning the Hollywood-Springdale Neighborhood Help Redevelop the Neighborhood?

Dana Bartolomei
Faculty Mentor: Michael Kirby
Urban Studies Program

Currently, there are two major problems stunting development in the Hollywood-Springdale neighborhood. First, there are inconsistencies between zoning and the actual land use of many parcels in the neighborhood. Second, there are an abundance of vacant lots. These two problems lead to the third and most detrimental problem, the lack of development in the Hollywood-Springdale neighborhood. Through the use of GIS (Geographical Information Systems) mapping and field-work, this project identified certain areas in the neighborhood for rezoning. These include areas that are light industrial, highway commercial and residential duplex. These proposed areas for rezoning can be taken to the Memphis City Council, for the formal rezoning of the neighborhood. After the rezoning of Hollywood-Springdale occurs, the long-term goal of redevelopment can happen.

Hollywood Dilemma: Creating a Positive Community Impact from a School Closure

Austin Horne
Faculty Mentor: Michael Kirby
Urban Studies Program

Under the Memphis City School System's current 5 Year Plan, Hollywood Elementary School, located at 1346 Bryan Street (directly northeast of Rhodes College), will close after the 2006-2007 school year. Its students will be "merged" with students at nearby Springdale and Shannon Elementary schools after the closure. The Hollywood School sits at the edge of the Hollywood Springdale, Hyde Park, and Douglass neighborhoods, all noted for their high poverty rates and associated social ills. There exist many possibilities for reutilization of the school building and site - the best type of re-utilization, however, is one that positively impacts the surrounding communities. Through analysis of the reuse of other closed Memphis City schools, the study will attempt to identify the most appropriate use for the Hollywood School building and site; a reuse that will combat the problems of the Hollywood Springdale and Douglass communities and improve the quality of life for surrounding residents. Preliminary research suggests that an educational use outside of the elementary school function would benefit the surrounding neighborhoods, serving alternative educational needs and providing residents with an invaluable community asset.

The Project to Reduce Litter and Instill Pride in Community Members:

Nathan Hulling and Marcus Falion
Faculty Mentor: Prof. Michael Kirby
Urban Studies Program

The Hollywood Springdale area had overwhelming amounts of litter and debris on vacant lots. Surveys from residents and businesses showed it was among their highest concerns. For the past four years the fraternities of Rhodes College sponsored large clean up events each semester to reduce the large amounts of debris and litter that was found in the Hollywood Springdale community. This project describes how the fraternities organized their efforts in both providing manpower and other resources.

Over these past four years the area has seen significant improvement. There have been at least two cleanups a year with fraternity participants ranging from 50 to 100. The total participants in the fall of 2006, including both

fraternities and the community, were approximately 150. There was significant media exposure as a result of the clean ups. The cleanups consist of fraternity men of Rhodes College partnering with community members to target and clean problem areas. Many times these areas consist of vacant lots and abandoned houses which become attractive spots for vagrants and eyes sores for the community. Although data are not available on actual changes in litter and debris, informal surveys with residents suggests that they have noticed an improvement in the physical conditions. The large dumping sites have disappeared from the neighborhood. Residents and stakeholders meet monthly at Springdale Baptist Church to develop strategies for improving the conditions. Other strategies are also being examined, including installing trash receptacles, residents adopting vacant lots, and the placement of billboards in the area.

Safe Streets for Springdale Elementary

Stephenie Johnson
Faculty Mentor: Dr. Michael Kirby
Urban Studies Program

In the Hollywood-Springdale area, the poor conditions of the streets and sidewalks along with the heavy amount of speeding traffic make walking in the neighborhood extremely dangerous. In September of 2006, a speeding car at the intersection of Hollywood and Jackson struck a mother and her daughter, a student at Springdale Elementary. In November, a group of students began addressing the problems that cause accidents like these around the school. It was discovered that Springdale lacked the proper and fundamental safety measures that other schools, such as Snowden Elementary, have in excess. While Snowden has signage, crosswalks, flashing lights, dependable crossing guards, and other crucial safety features, Springdale has virtually nothing of the sort. Safe Streets for Springdale Elementary is aimed at implementing several safety features around this school. The students were given a survey asking them how they traveled to and from school everyday and if they felt safe. For those students who walk, most of them wrote that they are afraid of the speeding cars. By working with the school, city council members, and volunteers from the surrounding community, a grant proposal was written in March, asking that enough funds would be given in honor of this project. If these funds are awarded, necessary changes will be made to improve the safety level around Springdale Elementary.

How to create greenspace in an urban community: lessons from a green initiative in the Hollywood-Springdale community.

Stephanie Juchs
Faculty Mentor: Rosanna Cappellato
Biology Department

A 2006 preliminary study identified 6 acres of adjoining vacant land as ideal for the creation of a urban greenspace in the Hollywood-Springdale community. Up until the mid-1980s, Velsicol Chemical Corporation dumped substantial amounts of chemical by-products into the nearby Cypress Creek, and these lots were left undeveloped because of the soil contamination. A non-profit organization, Hollywood Greenspace Community (HGC) was created with its primary objective being the conversion of these 6 acres into a safe and aesthetically-pleasing greenspace for the use of residents of all ages to relax, exercise, play, and socializes. In the past months its Board of Directors, composed of residents, local leaders, and Rhodes College faculty, staff, and students, has met to devise the best strategy to make this project a reality. These discussions have led to many suggestions on how to best integrate members of the . Memphis community into the development of this project and to secure funding for the acquisition and maintenance of this 6 acres land. In addition to specific recommendations, such as additional tree survey and soil chemical testing, the HCG experience has provided invaluable lessons in how to facilitate a green initiative in an urban community.

Achievement and Perceptions of Tutoring in the Hollywood-Springdale Area

Ashley Wells
Faculty Mentor: Michael Kirby
Urban Studies Program

Tutoring programs are currently ongoing in the Hollywood-Springdale area at Springdale Elementary School. The study focuses on the positive or negative effects that tutoring has on fourth-grade academic achievement and

student perceptions about the programs. First, I investigated whether tutoring programs improved grades among fourth-grade students at Springdale Elementary. To do so, fourth-grade teachers filled out a checklist noting if a student received tutoring. Also, the teachers provided information about a student's grades over the past semester by checking if a student academically declined, did not change, or improved. Second, data about student perceptions of the tutoring programs at Springdale Elementary were collected through an assessment survey by the fourth-grade students. One of the issues I examined was the correlations between tutoring and grade changes. Another issue I studied was the student perceptions of peer tutoring and the helpful or stigmatizing effects it had on students.

Spatial Analysis with GIS

Barret Library, entrance lobby and Middle Ground, beginning at 1:00 pm until 4:00 pm

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

This special session displays posters of final projects for the interdisciplinary course Geographic Information Systems (GIS) 222. The posters will be available for viewing from 1 - 4pm; the authors will be present for discussion from 1:15-2:30pm.

The Parks and the Population

Kris Schwetye
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

Since its inception on August 25, 1916, the National Park Service has had the goal of "conserv[ing] the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leav[ing] them unimpaired for the enjoyment of future generations." The intended audience of "future generations" has the potential to create problems as the United States' population continues to grow. Essential to the core values of the Park Service is stewardship in relation to resource protection. This project will essentially challenge the Park Service to maintain its ideals of public service by providing ample public space to all citizens in the United States. GIS mapping techniques can be used to explore the effect of population growth on the physical space administered by National Park Service over time. Spatial analysis is just one facet of holding the Park Service to their stated goals, ensuring their place currently and for the benefit of future generations.

Business Planning with Maps: A Study of Biodiesel Distribution Costs

Daniel Price
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

The city of Memphis still possesses only rudimentary alternative fuels infrastructure. Biofuels elsewhere in the country have met a positive reception, suggesting that biofuel initiatives in Memphis might well succeed. A start-up biofuels business will be most successful starting with freely available waste vegetable oil, the collection of which is time consuming and transport-intensive. Further distribution to agricultural and residential customers requires still more energy cost. We subjected a student business plan to a viability study using GIS. We were able to estimate fuel costs and optimize transport routes and schedules. Tools such as geocoding and route measuring allowed us to effectively refine our initial equipment and start-up plans.

The Spatial Distribution of Soil Types in Overton Park.

Tyler Cullender
Faculty Mentors: Carol Ekstrom, David Kesler
Departments: Interdisciplinary, Biology

Overton Park has historically been subjected to constructive alterations, the introduction of alien species, and heavy foot traffic. Due to the urban setting of the park, it's likely that its current flora, fauna, and soil composition represents a gross distortion of the ecosystem originally encompassed by the Overton Park boundaries. Implementing techniques in global positioning systems (GPS), geographical information systems (GIS), and soil science, I plan to characterize and plot the soil types present in Overton Park. A representative sample of soil types will be characterized by the accepted standards and arranged onto a grid rectified to the perimeter of the park. A buffer zone will be designed around each data point according to the soil type present. The resulting map should acceptably portray the diversity and spatial positioning of Overton Park soils. The data, when compared to the naturally-occurring soil distribution, may provide information on the severity of disruption of the park's ecosystem. The data may also be compared to the spatial distribution of the park's invasive species to determine the degree of correlation

The Effectiveness of Memphis Green Spaces

Brent Hubbard
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

Green spaces, or areas designated to be free from development for recreational enjoyment, are an important aspect of urban planning. Their importance spans beyond simply human enjoyment, as they are also a key part of maintaining animal biodiversity and sustainability. The GIS project presented will display all plots of official green space in the Memphis area, calculate the percentage of area covered by the spaces (one of the worst in the country compared to urban area), and analyze their efficiency and effectiveness based on the Theory of Island Biogeography. Buffers, showing the possible range of a particular species of mammal or plant, will also be used to illustrate the effect of habitat fragmentation and the possibility of migration from one ecological "island" to another. In the end, I hope to show some steps that could be taken to improve the overall effectiveness and efficiency of Memphis green space and illuminate the importance of such areas.

Changes in paved areas at Rhodes College over time

Stephanie Juchs
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

An increase in impervious surfaces in an area can have severe ecological consequences such as increased runoff, erosion, and alteration of the hydrological cycle. The problems caused by anthropogenic land-use changes have led lawmakers to implement regulations about the amount of paved surfaces in an area. I hope to examine the changes for the paved areas of Rhodes College by comparing past and present aerial photographs of the campus. By geo-rectifying these maps I will be able to quantify the amount of area that has undergone a transformation to a paved surface.

Cemeteries: A Comparison of Memphis and New Orleans

Caralee Barrett
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

The differences between cemeteries in Memphis and New Orleans are great. The purpose of this project is to explore these differences. Where are the cemeteries in each city, and what effect does their location have on them? In some cases there is no room for expansion for these cemeteries because the city has grown up around them. What does the location of the cemetery say about the people buried there?

The Gradual Change in the Path of the Mississippi River

Scott Bayer
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

Although it is not something that we necessarily notice within our own lifetimes, the course of the Mississippi River changes gradually due to both natural changes and human influence. Erosion and other factors cause changes in sediment which shift the river's course ever so slightly. These factors can be heightened by human settlement and the changes are more significant than one would often suspect. The government has been involved in flood control measures since the end of the 19th century. This includes dams, reservoirs, levees, and canals which each affect the river's course. One example is that the mouth of the river now empties deep into the Gulf of Mexico rather than at the coastline. This prevents needed sediments from depositing on the shallow coastal wetlands of Louisiana. By mapping the change in the river's path over the last couple centuries, we can better predict its future course. This would help us in many different areas including flood control, urban development, as well as agricultural planning. It can also allow us to see the effect that humans have on the river and make us more aware of our actions.

The Sprawl of Lauderdale County over Time

Merissa Ward
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

Lauderdale County, which consists of small rural towns, has grown over time. It is mostly agriculture, with major emphasis on cotton and produce, especially tomatoes. Ripley, a town in Lauderdale County, is consistently known as the premier tomato capital of the South. However, much effort has been put toward expanding the county's commercial businesses. Several strides have already taken place with a new mini shopping outlet in place and a movie theatre in the works. The county is slowly moving away from its agricultural nature to take chances in more businesses. This project will investigate the area change of Lauderdale County over time by looking at past maps and comparing them to present maps of the county. GIS technology will be used to georectify the maps and to calculate the change in area over time. It will be interesting to see how a small rural county in West Tennessee is moving forward to keep up with the times.

Demographics and Voting Patterns in District Five

Rebecca Williams
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

District Five in the city of Memphis extends from Midtown on the West to I-240 on the East, and is home to more than 40,000 citizens. Aside from its sheer numbers, this district is noteworthy because it has an active and diverse community from which there is much to learn in discussions and analyses of civic involvement and voting patterns. The 2003 election for county mayor was a non-partisan election. However, taking a close look at the results of this election in relation to certain demographics of the area, it is clear that most still voted along party lines. By analyzing the data from district five as it relates to such demographics as race, household income, and party affiliation, I will make predictions of what the results for the 2007 mayoral election might look like. I will be analyzing the demographics and the results of the 2003 election in attempt to answer the question of whether or not there is a connection between demographic differences and voting patterns and what this connection could mean.

A Model for Spatial Competition Using GIS

Paul Burmenko
Faculty mentors: Carol Ekstrom, Daniel Arce
Department of Economics, Rhodes College

Economists have developed a game theoretic model for spatial competition in markets with homogeneous products like gasoline. This study applies the model to several specific situations, including firms like calling centers competing over a homogeneous labor force and firms like hospitals providing a homogeneous product to a heterogeneous consumer base. Census data and GIS technology allow for the identification of specific populations in relation to the real estate market. The ability to combine such data allows firms to better serve their consumer base and distribute more of their product.

The Effects of Hurricanes on Galveston, TX

Carl Cook
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

Beach erosion is a growing concern for the people of Galveston, Texas.. The recent troubles Hurricane Rita and Katrina brought to the Gulf Coast clearly illustrate that hurricanes and weather play a large role in the well-being of the island and its residents. By using old maps, I will compare the size of the beaches and island today with those of pre-1900. I will also look at the islands' elevation above sea level, and the effects of potential new flooding. In addition, I will compare present and past evacuation routes, and look for possible new routes that could decrease congestion on the highways.

Building Height Zoning in Austin TX

Tyler Smith
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

The number of skyscrapers is increasing in downtown Austin, Texas. In the past, city regulations have placed a height limit on structures built downtown. Austin has grown rapidly since then, and the height limit has slowly increased. More tall buildings have been constructed downtown, limiting the view of our state capitol. Through using GIS maps I plan to show the progression of buildings constructed and their proximity to the capitol building. By doing this, hopefully other state capitals will enforce their code to keep their capitol building in view

Inventory of New Trees on Rhodes College Campus

John King
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

Over the years Rhodes College Campus has changed, some would say dramatically. With the addition of a new library, construction surrounding the old library, and annual remodeling projects; the physical features of the campus have been altered, changed, destroyed, and/or replaced. In an attempt to aid the Physical Plant with the inventory and mapping of trees that they have planted, I will be working with Brian Foshee to "tag" the trees planted by the physical plant. I will use GPS to mark individual trees and then transfer the information to a recent map of the campus. Using georectifying, I will add a layer of an old map of the campus to display the distribution of new trees and attempt to deduct if there are correlations between construction projects and new trees.

Parks in Memphis: How are they affected by the Surrounding Community?

Becky Ferguson
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

There are 166 parks registered with Memphis Parks Services. They are located throughout the Memphis area, and differ in size from over 100 acres to less than 25 acres. They serve different types of neighborhoods. A park can describe much about a local community because it is designed specifically to fit the people's needs, whether they may be a playground and basketball court, or solely a wide open grassy area. Next time you pass a park; think to yourself; how often do you spend time outside and enjoy walking or using the park in your neighborhood?

Comparison of Demographics of Memphis Historic Districts

Keller Bankston
Faculty Mentor: Carol Ekstrom
Department of Interdisciplinary Studies

Over the years the historic districts around the Rhodes College Campus have changed. The Memphis region contains a wide variety of historical offerings. In Memphis there are many historic buildings, sites, and districts. Some of the cities region's, such as Holly Springs, have large pre-Civil War era homes and residential neighborhoods. I will look further into these historic districts around Memphis in order to understand the overall demographics of the people now living in these historical areas. I will use GPS to mark individual sites and then transfer the information to GIS. Using the transferred GPS points as well as points that I already have, I will display the different demographics of the historical areas. By identifying these historical districts I hope to strengthen neighborhood associations and keep historic areas from declining and to recruit active participants in helping for preservation.

Community Involvement in Environmental and STEM Projects: SWEEP LEAPs to Robotics

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, and Associated Colleges of the South, Campus/Community grant for 2004, a Congressionally Directed Grants for 2004-2007, and a HUD COPC grant for 2005-2007, and Rhodes students Katie Holtkamp, Kevin Dinh, Amanda Sakla, Sara Connaughton, Laura Johnson, and Anum Minhas have worked with the SWEEP students on a variety of projects. This year in addition to studying Storm Water environmental education, the students spent time on a new program called LEAP, Lead Education Action Program; and then a Robotics program, which was an outgrowth of their week at Space Camp at* Huntsville AL.**

Our SWEEP partners are Cypress Middle School science teachers Mrs. Brenda Pirtle, Ms. Larissa Jackson, Ms. Dedrienne Rogers, art teacher Mr. Ron Welch , and Principal Mr. Raymond Vasser, Cypress Middle School students Kortney Williams, Brittany Garner, Jada Badon, Courtney Pollion , Victoria Thompson, Courterious Robinson , Luanda Lynn , Dominique Earl, Wesley Whitmore, Terry Donald, Duandra Lynn, TaCorria Dunlap, Arthur Grant , Ricca Dickens, Jasmine Barrett, Rickey Dickens, Shanquia Goodman, Denita Robinson, the Memphis Shelby County Health Department, Shasta Central, and the U.S. Space and Rocket Center Huntsville AL.

Lobby by Frazier Jelke Room 143

1:30- 2:30 Posters on Lead Contamination

Mall east of Barret Library

2:45- 3:15“The Great Robot Race” Student-designed Lego robots will compete to complete an obstacle course.

Biology 141 Laboratory Projects: Crayfish Behavior

Frazier Jelke 141W and 143W, 1:00 - 2:30 pm and 2:30-4:00 pm

Session Chairs: Jim Armacost, Tony Becker, Carolyn Jaslow, and David Kesler
Department of Biology

Section 1

Correlation Between Weight and Dominance in Female Crayfish
Amanda Hoeffken
John Musgrove
Sarah Henkel
Andrea Hassink

Crayfish's Affinity for Light vs. Dark Conditions
Sam Smith
David Piper
Hunter Utkov

Do Crayfish Show Preference for Different Light Conditions?
Joanna Aiken
Katherine Delavan
Kelly Ordemann
Lizzie Wright

Tank Color Preference in Male *Procabarus clarkii*.
Stephanie Cassel
Scott Galloway
Chassidy Groover
Scarlett Petilos

The Effect of Gender on Agonistic Behaviors in Crayfish
Steven DelBello
Hal Flowers
Andy Boucher
Jeff Ricker

The Effects of the Presence of Light on Crayfish Substrate Preference
Zach Albert
Scot Allison
Emily Jenkins
Mohammed Atiq

Section 2

Aggressive Behavior of Same Sex Crawfish in the Presence of an Opposite Sex Member
Thomas Hamilton
Natalija Kokoreva

Ryan Milvenan
Rebekah Moore
Katharine Scherer.

An Observation of the Territorial Behavior in Male Crawfish
Elizabeth Brown
Kristin Forbes
Keturah Dunlap
Megan Patrick

Determining the Aggressive Nature of Crayfish in Relation to Gender Interaction
Matthew Childs
Sammy Knefati
Michael Boehmler
Alex Kovalic

Crayfish Habitat Preference in an Aquatic Environment with the Presence of a Shelter
Rachel Bernard
Lauren Holland
Derek King
Tyler Koestner

Crayfish Do Not Show Preference for Either Plastic or Sand Substrate
Andrea Throne
Nina Guo
Elizabeth Bernard
John Nichols

Section 3

The Effect of a Reflective Environment on the Agonistic Behavior of Crayfish
Ciara Conway
Kelsie Persaud
Mina Sharifi
Olivia DeLozier

Comparison of Female versus Male Crayfish Cggressive Behavior
Jennifer Whatley
Laura Deines
Allie Garris
Chris Walk

Home Sweet Home: The Effect of a Familiar Shelter on the Substrate Preference of Crayfish
Liv Brown
Caroline Cook

Lauren Lieb

Effects of Gender on Crayfish Aggression
Zac Berry
Allister Wilton
Van Nguyen
Mary Elizabeth Huddleston

Crayfish Preference for Dark Environments Compared to Light Environments
Emily Roberts
Kasey Solar
Cybil Covic
Kelly Helvenston

Section 4

Determining the Behavior of Crayfish in Response to Different Depths of Water
Andrew Foss-Grant
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