



***Undergraduate Research and
Scholarly Achievement***

presents

URSA

Scholars Week

April 27 - May 1, 2009

BAYLOR
UNIVERSITY

Welcome to URSA's Scholars Week. Universities throughout the world are recognizing what Baylor faculty have known and practiced for decades: undergraduates who are directly involved in research are competitive with the best once they graduate and their success in this endeavor requires a faculty mentor who is not only an excellent researcher but also an outstanding teacher. Active involvement in undergraduate research provides quality contact between students and faculty, encourages active learning, communicates high expectations and works across diverse learning styles. Long understood as primary tenets for a good undergraduate education, these four have also recently been identified as undergraduate research outcomes by the American Association for Higher Education and Accreditation, the oldest association in the United States dedicated to the advancement of higher education.

You might remember that last year, this event was known as Scholars Day rather than Scholars Week. The change in title represents the dramatic growth in numbers of presentations since last year, with 107 presentations across 25 fields from 126 students and 57 faculty. As always, Baylor faculty and students have risen to the occasion! This year, I invite you to join me in not only supporting your own students but also taking the time to examine the scholarship of students in disciplines outside your own. You are sure to be impressed!

Enjoy!

Truell W. Hyde, Ph.D.
Vice Provost for Research

Martin Museum of Art
Hooper-Schaefer Fine Art Center
April 27 - May 1, 2009

Camille Hawbaker, Senior, Studio Art

Faculty Mentor: Professor Berry Klingman

Medium: Original woodcut, lithographic and intaglio prints

Title: *Capstone BFA Exhibition*
(Department of Art)

This group of prints is a sample from a personal dialogue on spirituality, and it is meant to reflect the evolution of the inner self. In my most recent work, I tried to convey this impression by creating a space filled with repeating shapes in overlapping layers, sometimes shifting but all relevant to each other. I found the source of my imagery in ginkgo leaves, which I admire for their elegant arcs. Each line and shape relates to the sense of space I experience in a dense canopy of leaves as light comes in from behind a tree and moves through its leaves. As they overlap and move about, the leaves create shapes and patterns not unlike the star patterns of the Middle East, and they shimmer like the mosaics in Byzantine churches. They are joining and departing, rising and falling in a field of colors that are of similar tonal value. The palette in each print is determined step-by-step as each layer helps to determine the one to follow based upon the visual relationships the colors share with each other. As the print evolves, the colors are intended to create a sense of harmony and prevent any one element from overpowering another so that different aspects of the image may emerge at different times. It is my hope that viewing this work is a meditative experience in the undulations of our inward thoughts and the search for understanding the world around us.

Erin Dobbins, Senior, Studio Art - Painting

Faculty Mentor: Professor Karl Umlauf

Medium: Painting - Oil and Watercolor

Title: *BFA - Senior Exhibition*
(Department of Art)

My work is about people. We live in a world of change. Where friendships end and begin as life fluctuates with proximity and time. I have painted those who are close to me, those whose relationships with me will change with the ebb of life.

I choose to tell the story of my friends, and out of each testimony that is transcribed, details emerge that form the individual. As the artistic process intersects with the individual in front of me, a dynamic change takes place in the way my sitter is viewed. My friend is now also my subject.

This relational change is communicated through two painting media: oil and watercolor paint. Like the subject matter, my thought process and therefore painting process changes from one medium to the next. While painting with oils, my sitters are part of a greater geometric scheme. This geometry of the painting combined with a prescribed color palette leads to a methodical painting process. Each area of the work is thought about and indulged. I find that precision and color dominate my painting with oils.

Abigail Wooldridge, Senior, Painting

Faculty Mentor: Professor Karl Umlauf

Medium: Painting - oil and acrylic on canvas

Title: *Distant Memories*
(Department of Art)

This body of work has been a challenging journey full of worth for me. I've found the process of painting to hold unspeakable, liberating joy. My journey has required numerous painting processes and as I continue to grow, the deeper the fulfillment I reap from a greater understanding.

My landscape studies are guided primarily by subtleties in color as I observe the impact of light on the land at various times of day. My aim is a more abstract concern for typical landscape forms, veering from realism and pushing the limitations of what can afford to be stripped away. With these atmospheric studies, I have grappled more formally with paint, seeking to bring the viewer into a spatially unknown, yet tangible place.

This notion of simplification and of editing the literal elements away from my work has served as a catalyst for newfound creativity. I am seeking to challenge other forms of surface work and take greater risks with paint, pushing myself to interact more spontaneously with the canvas. With layers of thick and thin color, textural marks, and calligraphy, movement of the landscape is confronted in a more expressive, abstract space.

Throughout this work, authentic growth manifests itself in paint, and I continue to be inexplicably satisfied.

Bill Daniel Student Center
Baines
April 27, 2009 * 1:00 - 1:45 p.m.

Eric Headstream, Senior, Philosophy

Faculty Mentor: Dr. Jonathan Kvanvig

Title: David Lewis, Infallible Knowledge, and Epistemic Satisfaction
(Department of Philosophy)

In his article "Elusive Knowledge," David Lewis attempts to sketch a contextualist theory of knowledge which is both anti-skeptical and infallibilist. He begins on familiar evidential grounds but adds a contextual twist in order to thread the narrow gap between fallibilism and skepticism. His method is a bit unusual, even unique, and in the end he claims to have arrived at a model of knowledge that both guarantees truth and is closed under strict implication; these two features defeat fallibilism and skepticism, respectively. Furthermore, he claims to maintain this theory apart from and despite radical skeptical possibilities such as Descartes' Evil Genius or the brain in a vat scenario. Whether Lewis succeeds in his efforts is difficult to determine. In this paper I examine Lewis's theory of knowledge, giving special attention to the twin dangers of fallibilism and skepticism. I show that the infallibility of Lewis's account is bought at the expense of its anti-skeptical power. Because of this, his account is unsatisfactory even if it should prove correct. I then offer a brief outline of what a more satisfactory account might be.

Eva Studer, Senior, Philosophy

Faculty Mentor: Dr. Lenore Wright

Title: Criticisms of Andrea Dworkin's *Intercourse*
(Department of Philosophy)

Andrea Dworkin's work *Intercourse* (1997) offers a radical feminist account of sexual intercourse and its role in women's oppression. Dworkin builds a shocking and convincing argument that intercourse strips women of privacy and deprives them of full human agency. In this essay, I argue that Dworkin mischaracterizes the relationship between sexuality and power. More specifically, I show that Dworkin ignores the variable nature of language and the critical role that language plays in shaping structures and perceptions of power. By exposing Dworkin's assumptions about language and power, we can reinterpret the relationship between intercourse and equality.

Bill Daniel Student Center
Baines
April 27, 2009 * 1:45 - 2:30 p.m.

Megan Rizos, Senior, University Scholar

Faculty Mentor: Dr. Kathy Whipple

Title: The Influence of Music on Secondary Language Acquisition
(Department of Communication Sciences and Disorders)

The true influence of music on an individual has always been and still remains largely a mystery. Expecting mothers expose their unborn children to classical music in the hopes of raising the child's IQ; caregivers and hospitals play music for their patients in the hopes of lowering their blood pressure; any given person on the street can hear songs that they have not heard in over a decade and can still recite them with perfect accuracy. My thesis attempt to debunk some of the mystery of musical influences, specifically on music as it relates to secondary language acquisition. The real question is do musicians have an advantage over non-musicians in acquiring secondary languages due to their superior auditory sensitivity?

Does gender play a role or dexterity? How long would one have to play to acquire the advantage? My survey based thesis addresses these questions and provides answers derived from 138 case studies.

Bill Daniel Student Center
Baines
April 27, 2009 * 2:30 - 4:00 p.m.

Travis Jones, Senior, Biology

Faculty Mentor: Dr. Frieda Blackwell

Title: *Antonio Machado and the Problem of Spain*
(Department of Modern Foreign Languages)

Antonio Machado, the great Spanish poet of the early twentieth century, lived during a tumultuous time in his country's history. Its recent defeat by the United States in a brief war in 1898 brought the realization that Spain lagged behind the rest of the modern world. The Generation of 1898, a group of Spanish writers, including Machado, was not afraid to highlight these national problems in their respective works. In three specific poems, one can see Machado's critique of issues in Spain dealing with the upper class, religion, and education. In "Llanto de las virtudes y coplas por la muerte de don Guido," Machado exposes the laziness and hypocrisy of Spain's aristocracy who, instead of leading the country, are more concerned about pleasing their appetites and putting on a face of religiosity. In "La Saeta," Machado illustrates the absence of life-giving faith in religion that has been replaced by empty rituals. In "Recuerdo infantil," Machado describes Spain's retrograde educational system that concentrates on teaching children useless facts rather than problem solving. Although offering no specific solution to these problems, the poetry of Machado attempted to serve as a gadfly to spur change in Spain.

Amanda Swenson, Sophomore, Language and Linguistics

Faculty Mentor: Dr. Frieda Blackwell

Title: *Spanish Fabliau, Cervantes and the "Viejo Celoso"*
(Department of Modern Foreign Languages)

In "El Viejo Celoso" Miguel de Cervantes uses illusions and burla to explore and make a social commentary on the roles of husbands and wives in a marriage. Cervantes uses comical illusions to highlight Cañizares and Doña Lorenza's unrealistic expectations and shows throughout the entremés how these result in burla and negative reactions. The paper explores the persona of el viejo celoso by commenting on his age, impotency and how his illusions lead to disillusion. Doña Lorenza suffers from illusions about the intimacy in her relations with her husband, and her attempts to manipulate her husband's illusion. Both of these things result in her own disillusion. Through the development of Cañizares and Doña Lorenza, Cervantes highlights the importance of free will and more equal marital relationships than those common in Spain's Golden Age and challenges the audience to reflect on marital roles for themselves.

Paige Myers, Junior, Spanish

Faculty Mentor: Dr. Frieda Blackwell

Title: *Domestic Violence and Female Agency in Pardo Bazán*
(Department of Modern Foreign Languages)

Emilia Pardo Bazán, an extremely influential writer of the late nineteenth century, produced many works that contain "progressive views on women's rights, abilities, and responsibilities". Frequently Pardo Bazán shows what López-Sant calls "un interés progresivo" in her works that deal with aspects of society that she wishes to reform. The issue of physical and psychological abuse of women by their partners received scant attention because of social views that women were the property of their fathers and then their husbands. Her short stories, "El encaje roto" and "Piña" both evince her interest in addressing abuses about which the society remained silent. These two stories support women's rights, show the need for autonomy in the lives of women and give examples of the consequences of domestic violence. By exposing a major social problem not discussed in her day, Pardo Bazán hoped to help women gain rights to "education and privileges" that could give them equal rights with men and free them from the destructive force of domestic violence.

Hannah Kaminer, Senior, Spanish

Faculty Mentor: Dr. Frieda Blackwell

Title: *Tempus Fugit and the Question of Water in Three Poems by Antonio Machado*
(Department of Modern Foreign Languages)

This essay discusses the image of water in three poems by Antonio Machado, within the context of his philosophy regarding the concept of time. Water is a dominant symbol throughout Machado's poetry and thought; as Lauxar, the Uruguayan scholar puts it, water "tiene para él un hechizo particularísimo." Machado was famous for saying that poetry is the dialogue between a man and his time. The frequency of the water image in his poetry leads us to ask: what is the significance of this image in the dialogue between a man and his time? This essay will treat this subject by discussing "La noria," "Recuerdo infantil," and poema XXXII ("Las ascuas de un crepúsculo morado"), and will argue that the water image in these poems represents the relationship of the poetic voice to time. The poetic voice hears time passing in the buckets of the waterwheel in "La noria", sees time passing in the rain in "Recuerdo infantil," and feels time coming to its end in "Las ascuas de un crepúsculo morado" (poema XXXII). For the poetic voice, time is something that passes in monotony, without progress, and eventually simply arrives at its end, which is death. These poems present a vision of life as futile, because life always ends in death. Nevertheless, the existence of these poems suggests that there could be a manner of overcoming or transcending death: poetry, which is symbolized by the words "sueño" and "recuerdo."

Bill Daniel Student Center
Baines
April 27, 2009 * 4:00 - 5:00 p.m.

Alex Nix, Senior, Spanish

Faculty Mentor: Dr. Michael Thomas

Title: Parody and Paradox in the Early Theater of Buero Vallejo
(Department of Modern Foreign Languages)

In my study on the theater of Antonio Buero Vallejo, the prevalence and dominance of everything reflecting two sides or exhibiting a double character will be investigated thoroughly within his first written work "In the burning darkness" (1946) and "The double story of Dr. Valmy" (1964) another work written about eighteen years later. While the emphasize of the investigation lies within the double meaning, use or symbolism of traits and work-specific factors, the biographical facts and historical placement of Antonio Buero Vallejo will introduce the general audience to his theater. It is important to note that he revived the Spanish theater in post war Spain after it experienced a dramatic slump in creativity and interest falling into a theater of escapism. Antonio Buero Vallejo put life back into the Spanish theater both literally and figuratively through utilizing parody as well as metaphors that the cultivated spectator could enjoy in the midst of strict intellectual and creative censorship imposed by Franco.

Rachel Pfarr, Senior, Biology

Faculty Mentor: Dr. Paul Larson

Title: The Aleph: Gateway to Truth only seen by the Blind
(Department of Modern Foreign Languages)

Mankind creates his world through subjective eyes, receiving information from the senses and interpreting them as best he knows how. Yet this approach falls short for things beyond the tangible—abstractions and truths bigger than this world. "El Aleph" by Jorge Luis Borges explores man's dependence upon the senses and exposes his tendency to take things at face value rather than delve into their deeper meaning. Through a fictional Borges's encounter with a mystical portal called an Aleph, the reader is able to see that much more lies within the enigmas of this world, as well as deep beneath the skin and very constitution of the person. Man limits himself by his reliance on what he can feel, see hear, touch, and taste, but he can break free of such limitations if he only strikes out in discovery of absolute truth.

Alex McVey, Senior, Spanish

Faculty Mentor: Dr. Paul Larson

Title: Obscure Strategies – Baudrillard, Borges, and the Strategy of the Object
(Department of Modern Foreign Languages)

This paper attempts to add depth to the critical discussion on the works of Jorge Luis Borges. Many critical interpretations of Borges start from the point of subjectivity. This leads many critics, especially feminist critics, to find Borges' work lacking in space for resistant or feminine subjective experience. In this paper I argue that this subjective enterprise betrays the challenge posed to us by Borges' work. I read Borges' short stories "Emma Zunz" and "El Muerto" through the critical lens established by Jean Baudrillard's theoretical work on the strategy of the object. Baudrillard's philosophy is an endeavour in thinking beyond the bounds of subjectivity. Baudrillard says that by letting those who attempt to control you think that they have won over, you employ the subtle ironic strategy of the object that allows you to inverse the whole system of power relations. These works operate in tandem with Baudrillard's philosophy to show the strength of those who refuse all identity, subjectivity, and resistance, in favor of artifice, objecthood, and singularity.

Bill Daniel Student Center
Beckham
April 27, 2009 * 12:00 - 1:00 p.m.

Mallory Briggs, Senior, Religion
Faculty Mentor: Dr. Doug Weaver

Title: *The Ordination of Women: Some Considerations*
(Department of Religion)

The purpose of the paper is to examine whether women should be allowed in all leadership positions in the church. Two of the main biblical passages that are at the center of this debate are 1 Timothy 2:11 – 12 and 1 Corinthians 14:34 – 35. These verses are believed by Christians who do not allow women in the church as clear commands by Paul concerning the issue. They interpret the verses to apply literally the same to all time periods. This paper attempts to raise doubt in the literal interpretation of these verses by analyzing the verses in different ways. Historical context, culture, addressing problems within a specific church, word translations, and other interpretations and ideas will be reviewed. Also as part of the argument, the paper will examine women that were involved in leadership during the early church and explain how that fits into these verses. Together, the interpretations analyzed in this paper raise doubt about current practices of churches that exclude women from leadership based on these texts and cultural traditions. The second half of the paper will look at some prominent denominations that both allow and deny women leadership and their reasons why.

The paper does not solve the issue but challenges an important view and teaching of Christians and some denominations. The issue has to be debated; possibly, women are being denied the right to exercise their calling from God by being restrained by an interpretation of Scripture that is too literal.

Victoria Robb, Senior, Religion
Faculty Mentor: Dr. Rosalie Beck

Title: *Establishing a Denomination: A Look into the Genius of Aimee Semple McPherson*
(Department of Religion)

Aimee Semple McPherson, as she is most commonly known is recognized for her flamboyance, antics, and reputation for controversy. She became the most well-known Pentecostal preacher of her time, and according to one of her biographers, during the heyday of her ministry in the 1920s, she made the front page of America's biggest newspapers at least three times a week on average. "Sister Aimee" is undoubtedly one of the most significant figures in Pentecostal history. Having founded the International Church of the Foursquare Gospel in 1927, the denomination continues to have nearly 2,000 congregations worldwide. Its vision is to present Jesus Christ, God's Son, to every person in every culture as "The Savior, The Baptizer with the Holy Spirit, The Healer, and The Soon-Coming King."

McPherson's evangelistic success is in tribute to her striking methods and organizing genius. What made her successful in founding the Church of the Foursquare Gospel and what contributed to her renowned evangelistic work requires a deep look into her early life and ministry, her willingness to use all available resources to market religion, and the types of people that were drawn to her message of faith and hope.

Eric Van Hal, Senior, Religion
Faculty Mentor: Dr. Rosalie Beck

Title: *The Woman's Bible: The Feminist, Her Comments, and Those Who Respond*
(Department of Religion)

Elizabeth Cady Stanton drafted *The Woman's Bible* in hopes of making a change in the United States. She was a strong supporter of Woman's Suffrage, Temperance, and the abolition of slavery, but most of her focus was on woman's suffrage. Stanton spoke on woman's oppression at the hands of men, and she spoke against Christianity and the Bible, claiming that they oppress women as well. In this paper, Elizabeth Cady Stanton's life is analyzed and there is discussion on why she became what she did, and wrote what she wrote. The paper also analyzes the content of *The Woman's Bible* and gives the author's own commentary on the work. Finally, the paper exposes the responses by others about *The Woman's Bible*, and analyzes the effects of *The Woman's Bible* on the suffrage movement. In conclusion, one finds that *The Woman's Bible* ultimately had a negative effect on the woman's suffrage movement. Stanton was an excellent public advocate, who was an important person in the feminist movement. Stanton has a drastic influence in the current feminist movement and should be applauded for that, though *The Woman's Bible* was a sour piece of her life. Her father's comments, her rejection from Union College, her failed conversion experience, and the woman's oppression that she encountered throughout her lifetime all caused her to become an anti-Bible feminist. *The Woman's Bible* ultimately hindered the woman's suffrage movement, but Elizabeth Cady Stanton and her other works were the life-support that carry the movement, even today.

Bill Daniel Student Center
Beckham
April 27, 2009 * 1:00 - 2:00 p.m.

Austin Almaguer, Senior, Religion

Faculty Mentor: Dr. Rosalie Beck

Title: *Transforming Culture: The Life and Thought of Walter Rauschenbusch and Dorothy Day*
(Department of Religion)

The Industrial Revolution of the early twentieth century in the United States was a time of dramatic change. The rapid growth in the industrial cities and the excesses of laissez-faire capitalism created countless injustices experienced by the working class. In response, Christian leaders Walter Rauschenbusch and Dorothy Day devoted their lives to combating the social structures responsible for creating the problems facing the poor. Rauschenbusch's approach, centered in his liberal Protestant background, emphasized the present and coming reign of the Kingdom of God. In contrast, anarchism as expressed in communities practicing love in action created the cornerstone to Day's liberal Catholic teaching. The difference created unique problems for the Social Gospel that were not experienced by the Catholic Workers movement. Rauschenbusch's structuralist approach to creating the Kingdom of God on earth led the movement to be absorbed by the larger social organism. However, the Catholic Workers movement retained its separate identity by existing on the margins of society and seeking change through a grassroots movement. Nevertheless, both leaders remain important figures in the history of American Christianity. Indeed, modern leaders such as Dr. Martin Luther King Jr. and Shane Claiborne acknowledge the influence of Rauschenbusch and Day in their theological development. Clearly, the message of these two leaders continues to inspire new movements of social transformation. Rauschenbusch and Day challenge Christians of all generations to actively embody Christ's message of love and justice in order to transform society into one more reflective of the divine.

Skylar Anderson, Senior, Religion

Faculty Mentor: Dr. Rosalie Beck

Title: *Theological Innovator or Visionary Heretic? E. W. Kenyon's Effect of Pentecostal Theology*
(Department of Religion)

In recent years, E. W. Kenyon, a fairly obscure evangelist of the early 20th century, has been accused of being the heretical father of the modern Word-faith movement, a movement that bases its health and wealth theology on Positive Confession. D. R. McConnell claims Kenyon adopted metaphysical concepts from cults such as New Thought and articulated their ideas in a way palatable for Christians, thus his theology was inherently unorthodox.

My paper will show that arguments against Kenyon are ill-founded and that his primary importance was not on modern faith movements, but rather on Kenyon's own contemporaries. While the end result of his theology was an emphasis on healing like that of the metaphysical cults, Kenyon arrives at this emphasis through biblical study. His theology is thus well within the realm of Orthodox Christianity. Due to this biblical foundation, Kenyon was vital in the development of Pentecostal theology from a biblical point of view in regard to both prayer and a notion of Jesus as healer.

Michael Sturdy, Senior, Religion

Faculty Mentor: Dr. Rosalie Beck

Title: *Devotional Veneration: Saints and Hagiography in Medieval Western Europe*
(Department of Religion)

Protestants, even well-intentioned ones, tend to succumb to two fundamental misunderstandings of medieval thought: 1) that superstition reigned supreme in the poorly dubbed "Dark Ages" and 2) the cult of saints was an essentially idolatrous system that detracted from proper Christian worship. I will attempt to overcome the first misunderstanding by taking a deeper look at the theology behind the veneration of the saints. The second problem will be countered with an analysis of the hagiographical ("Saints' Lives") literature and its purpose in Medieval Christian devotion in Western Europe, looking at both the theory behind the hagiography and presenting a number of specific hagiographical sources.

Bill Daniel Student Center
Beckham
April 27, 2009 * 2:00 - 2:45 p.m.

Preston Clark, Senior, English

Faculty Mentor: Dr. Richard Russell

Title: *The Distortions of "The Wandering Rocks" to Joyce's Ulysses*
(Department of English)

In this thesis I argue that Episode Ten of James Joyce's *Ulysses*, "The Wandering Rocks," is a distorted and insufficient version of the entire novel in two ways. First, the narrator of "The Wandering Rocks" is a cynical and superficial version of the narrator of the first six episodes. By adopting Weldon Thornton's ideas about the narratorial development of *Ulysses*, I show how this narrator is an example of the many distorted voices that narrate the later episodes. The narrator of "The Wandering Rocks," like the initial narrator, presents the characters of his episode in a free indirect style. However, he often presents a distorted and insufficient view of these characters. Also, "The Wandering Rocks" is sub-divided into nineteen sections. I argue that the second way "The Wandering Rocks" parallels the novel is that each of the first eighteen sections corresponds to the eighteen episodes of "Ulysses." In these sections, the narrator criticizes and distorts the characters and themes of the respective episode. These criticisms typically arise from the narrator's ignorance or malice. The final section of "The Wandering Rocks" applies the point of view of the narrator of "The Wandering Rocks" to the British Lord Lieutenant of Ireland. The result is the presentation of a city very much unlike Dublin as seen in the rest of the novel.

Jaclyn Drake, Freshman, English and Theatre

Faculty Mentor: Dr. Tom Hanks

Title: *The Perfect Balance: Double-Casting Cordelia and the Fool*
(Department of English)

The audience applauds, and the curtain rises. On stage, one of Shakespeare's greatest tales begins to unfold as a father and king banishes his most devoted daughter. Soon after, a laughing, singing Fool enters, indirectly scolding the king for his mistake and prophesying the looming consequences. However, the actor who plays the daughter and the Fool is the same – a simple directing choice, but an impactful one. William Shakespeare's *King Lear* is one of his tragedies most frequently seen on stage. As it has been reproduced, different directors and actors have added their own artistic touches and interpretations to the play. One of these is double-casting, or allowing the same actor to play the two roles of Cordelia and the Fool. Curiously, the two characters never appear on stage together. However, they are strongly linked in function, in physical appearance, and in the written format of the play. Double-casting Cordelia and the Fool provides a beautiful balance between the great theatrical tradition associated with Shakespeare and the artistic need for a director to communicate familiar themes to a new, modern audience.

Bill Daniel Student Center
Beckham
April 27, 2009 * 2:45 - 3:45 p.m.

Audrey Johnson, Junior, Language and Linguistics

Faculty Mentor: Dr. Clay Butler

Title: *Responding to Criticism in Conversation: A Linguistic Analysis of Critical Comments Among Friends*
(Department of English)

This paper is based on examples from an hour-long video-recorded conversation among three college women as they work on a scrapbooking project together. In accordance with Brown and Levinson's theory of linguistic politeness, the dynamics of this conversation present an interesting interplay of distance, rank, and power, especially as it is displayed in the way the women criticize each other and respond to criticism. Since "distance" is constant and "rank" varies with each individual utterance, Mary's status as a "scrapbooking expert" gains significance as one of the few unbalanced elements. The manifestation of Mary's "power" is evident as she offers criticism of the other two, especially Dee, throughout their work on the scrapbook. This paper will focus specifically on Dee's various response strategies, noting in particular her use of exaggeration. For example, when Mary assumes an overly powerful position in the group, Dee responds by assuming an overly weak position. Also, when Mary accuses Dee of being incompetent, Dee responds by suggesting an act of ridiculous incompetence. In this manner, Dee attempts to protest instances of Mary's criticism that she judges to be inappropriately harsh for the situation. In addition to Brown and Levinson's politeness, analysis will rely heavily on Goffman's idea of face and Paul Drew's work on responses to teasing.

Jennifer Rader, Junior, Language and Linguistics

Faculty Mentor: Dr. Clay Butler

Title: *Why So Serious?: Analysis of Creating and Responding to Teasing in Conversation Among Friends*
(Department of English)

This paper focuses on examples from an hour-long video-recording of three friends as they scrapbook. Mary is the resident scrap-booking expert, while Eve has little experience and Dee has none. This difference in experience is a main basis for teasing in the conversation. This paper describes how the girls tease, and how they respond to those teases. Some of the techniques used to successfully deliver teases throughout the conversation include, exaggeratedly raised voice, emphasized laughter, as well as a "teasing tone." Also, in response to teasing, the girls utilize defensive work, like extended accounts. They also engage in offensive response-work by playing along with the tease and therefore rendering it a harmless joke. By effectively delivering and responding to teases, the young women are able to bond in a friendly and humorous environment. The analysis will rely heavily on Tholander and Aronsson (2002), Bollmer et. al. (2003), and Jones and Newman (2005).

Haley Elisabeth Simmons, Freshman, Undecided

Faculty Mentor: Dr. Tom Hanks

Title: *Connoisseurs of Dualism: The Metaphysical Bond Between Identical and Fraternal Twins*
(Department of English)

As twins, we are connoisseurs of dualism. Ancient myths have portrayed us as good vs. evil, genius vs. mediocre, and demigod vs. human. When two hearts begin beating at the same time, there is an undeniable metaphysical tie between the two individuals. Although one may argue that DNA is the deciding factor concerning such a close relationship and thus exclude fraternal twins, there is something to be said for "wombing" in unison. A fraternal twin myself, I argue that there is an almost mystical bond between twins. That bond begins in the womb and is made apparent in infancy. It is a necessity throughout childhood and colors the experiences of twins reared apart.

Bill Daniel Student Center
Beckham
April 27, 2009 * 3:45 - 5:15 p.m.

Matthew Swift, Freshman, Baylor Business Fellows

Faculty Mentor: Dr. Tom Hanks

Title: *Homeschoolers: Social Misfits or Simply Misunderstood?*
(Department of English)

Being taught at home through high school has shaped my life, and homeschooling continues to shape the lives of about two million United States students. However, countless people still ask, "What about socialization?" Many have false impressions of home education, especially in believing it is not generally as effective as the public school system in socializing children and developing them into responsible, socially adept adults. I will give some background on homeschooling in America, present some of its perceived pros and cons, address some misconceptions, and provide statistical and professional evidences of home education's success in socializing children and adults.

Jared Brimberry, Sophomore, Economics

Faculty Mentor: Dr. Tom Hanks

Title: *The Anomaly of Educational Success in Cuba*
(Department of English)

With an economy still marred by the loss of its main support, the Soviet bloc, Cuba educates. While limiting free expression, Cuba educates. While rationing food and other necessities, indulging a fifty-year regime and consistently sparking controversy, Cuba educates. This socialist society presents the anomaly of a thriving education system operating alongside a weak economy and an oppressive government. Cuba's literacy numbers alone demand recognition, but the country also boasts citizens with so much tertiary education that they export teachers, doctors and researchers to the rest of the region. This anomaly demands attention. Cuba excels in a region where it should not excel, and it continually succeeds in decades that it should not. Perhaps even more intriguing: this highly criticized country educates under a government system known for suppression, not education. Cuba sustains all of these paradoxes with its simple but rigorous approach to educating, from which much can be learned. Cuba devotes itself to education in a manner that reflects only one word: commitment. It constantly strives for improvement and incorporates this devotion to education and literacy into a national goal that both the government and the citizens cannot help but achieve. Chiefly by examining Cuba's literacy success, while still considering other educational merits, much is understood. And much can be learned, because somehow, in spite of other government failings, Cuba educates, and educates well.

Hilary Andrews, Sophomore, French

Faculty Mentor: Dr. Tom Hanks

Title: *Obama's Recession versus Roosevelt's Depression*
(Department of English)

America's current economic crisis bears a striking resemblance to the Great Depression of the 1930's. Likewise, President Barack Obama's stimulus plan mirrors key characteristics of Franklin Delano Roosevelt's New Deal agency. The question is: will history repeat itself? Observing the pros and cons of Obama's relief efforts in relation to Roosevelt's programs will provide valuable insight in predicting the outcome of the recession. In the specific areas of unemployment and bank failure, America's current situation can be compared to the past with hopes of resolving the crisis more effectively.

To boost the economy, Obama has proposed a massive fiscal stimulus package – similar to the New Deal approach to the Great Depression. As learned from America's economic state of affairs in the 1930's, "deflation poses a far greater risk to highly leveraged economies than a recession in times of moderate inflation" (Bailing). Many Americans who had not locked in their mortgage rates were victims of rates that sky-rocketed due to lenders putting families into loans they could not afford. American economist and Nobel Prize winner Paul Krugman states: "Right now, our economy is being dragged down by our dysfunctional financial system, which has been crippled by huge losses on mortgage-backed securities and other assets" (New York). Obama plans to put a stop to this injustice and thereby prevent the continuum of the economic downward spiral (Bailing).

Bill Daniel Student Center
Beckham
April 27, 2009 * 3:45 - 5:15 p.m.
Continued

Alyssa Erratt, Senior, International Studies

Faculty Mentor: Dr. Tom Hanks

Title: *From Instability into Conflict*

(Department of English)

Earth's historical landscape is marred by murders, kidnapping, world wars, drug wars, internal displacement and human rights violations; human growth and competition have led to turmoil and conflict. These issues are not restricted to history; new examples of human struggles and discord appear constantly on a global scale. In Latin America, conflict, both between countries and within countries, arises frequently. Political and social instability, common in both Central and South America, create tensions that often lead to open domestic and international conflicts. Current events in Venezuela are one example of internal and external conflicts developing from a lack of national political, economic and social stability. In an effort to demonstrate this fact, this paper will first introduce the basis of the Venezuelan political, economic and social structures, and then look at specific weaknesses within these three categories that have contributed to current disputes facing the South American nation.

Bill Daniel Student Center
Fentress
April 27, 2009 * 12:00 - 1:00 p.m.

Stephanie Rivera, Freshman, Anthropology

Faculty Mentor: Director Janet Norden

Title: *The Price of Convenience*

(Global Community Living-Learning Center)

“The Price of Convenience” is a study concerning high school age students and the effect technology has on their reading interests. This study is conducted by survey method to the students. The surveys include a series of questions regarding the student’s personal reading interests as well as a compilation of the number of technologies they use daily for a specific amount of time. This study was also issued to college students at Baylor University, to gauge differences between students already in college, who have met specific education goals to be in their schools, and high school students who may not have the same intentions after high school.

The aim of this project is to study a population of high school students, through a selection of about 60 surveys distributed in the Waco Texas Independent School District. My main intentions are to bring awareness to how much students read and spend their time. Due to this matter of subject, my hypothesis is Students who spend more than two hours on more than three technology devices daily are less likely to read from books. Moreover, today’s teenagers do not have enough time on their hands because of school work, and excessive use of modern technology. I am attributing this hypothesis to the “fast paced” and moving forward outlook of our society today. Most of these technology inventions are geared towards convenience and excess extravagance of pleasure.

Kimberly Gibson, Freshman, English

Faculty Mentor: Director Janet Norden

Title: *Expectations: Examining Familial Influences on College Attendance*

(Global Community Living-Learning Center)

In today’s America, one would like to say that educational opportunity is equally distributed; however, variables in family culture and viewpoint can deeply affect the choices and foreseeable options of a young adult in pursuing higher education. This study on familial expectations, performed through a survey format, seeks to identify correlations and trends that may suggest to what extent parents influence their children’s educational choices. The survey was given randomly to 36 college students attending Baylor University as well as 36 high school students attending University high school in Waco, Texas. On the survey, such questions related to family meals, religious service participation, and study interests were asked in order to compare and contrast these details with interest in college attendance. The Baylor students surveyed serve as a control group to the high school students—the Baylor students being an example of successful participants in higher education. Their past high school activities and situations might provide some guidelines for analyzing motivations toward college attendance. By taking a look at what kinds of students successfully attend college, high school workers and parents could develop methods of encouragement for promoting higher education and lowering drop-out rates.

Helena Hernandez, Junior, International Studies

Faculty Mentor: Director Janet Norden

Title: *El Otro Medico*

(Global Community Living-Learning Center)

Folk Medicine: the treatment of ailments outside clinical medicine by remedies and simple measures based on experience and knowledge handed down from generation to generation (Web MD Medical Dictionary).

This research deals with the utilization of folk medicine (i.e. herbal preparations, ritual healings, deep tissue massages) by Mexican-Americans in the Waco area. I want to find out:

- 1) If curanderismo is prevalent in Waco, and
- 2) If its use hinders, improves, or does not affect conventional health services.

I plan on doing a long-term study of curanderismo, something that I hope will help me to develop a treatment approach that brings together the traditional and the modern to better serve the Mexican-American population especially those that are in areas where it is difficult to access modern health care. This research will be conducted through survey-interview hybrids (i.e. less respondents than in most surveys, but more respondents than in most interviews. Expect around 25-50 respondents for this semester.)

Bill Daniel Student Center
Fentress
April 27, 2009 * 1:00 - 2:00 p.m.

April Leman, Senior, Journalism

Faculty Mentor: Dr. Mia Moody

Title: *Media Framing of Big Business: The Private Jet Crisis*
(Department of Journalism)

“The Big Three” are in crisis, which could potentially devastate millions of families through unemployment and wage cut backs. As they seek governmental aid, the media has been less than kind to the auto tycoons. Media outlets attacked the CEOs of Ford, Chrysler, and GM for flying to Washington on three separate private jets to ask for government financial assistance. My research examines how the media views big business, how they frame business executives in news stories, and how that affects public opinion. Media’s impact on the public’s view of business/the economic crisis is already prompting a reaction – one of these areas is business school curriculum. Professors are changing how they teach their students in order to better prepare them for these problems. My research is a synthesis of previous work and my own primary research, which will show more clearly the media’s affect on how the public views Big Business.

Billy Collins, Senior, Journalism

Faculty Mentor: Dr. Mia Moody

Title: *Media Framing, National Crisis Management and the Food and Drug Administration’s Public Legitimacy*
(Department of Journalism)

This study examines the mainstream media coverage the U. S. Food and Drug Administration’s role in the 2008-2009 salmonella outbreak associated with the Peanut Corporation of America. By studying previously defined media frames and the media’s use of FDA press releases, I will argue that at the national level, the agency’s public legitimacy, and thus its future, is determined by the public’s perceived notion of government control rather than by the agency’s ability to inform its publics of its role in crisis management. By comparing the 2008-2009 outbreak with other recent food safety concerns, this study will show that governmental crisis management and response differs from and cannot be dictated by the body of research associated directly with corporate public relations.

Ashly Hester, Junior, Journalism

Faculty Mentor: Dr. Mia Moody

Title: *Governor Gone Wild: The Rod Blagojevich Scandal*
(Department of Journalism)

For JOU 4371, I have been conducting research on a current media crisis. I decided to follow the Illinois scandal involving Governor Rod Blagojevich attempting to auction off President Obama’s former senate seat. My presentation will explore my research and findings and analyze the way in which the media and Blagojevich’s public relation’s team responded to the crisis.

Bill Daniel Student Center
Fentress
April 27, 2009 * 2:00 - 3:00 p.m.

Casen Brown, Senior, Marketing
Cassie Homan, Senior, Marketing
Faculty Mentor: Dr. Kirk Wakefield

Title: *The Effectiveness of Company-Initiated Web-logs in Promoting Theatrical Releases*
(Department of Marketing)

Walt Disney Studios presented our class with an interesting question: What elements of company-initiated blogs ("web-logs") regarding new releases are most likely to generate interest? If a relationship exists between a blog's features and its ultimate success (success meaning that it has regular readers and attracts new readers on a regular basis), a company-initiated blog could actually be used to market upcoming Disney releases. We immediately began reading through past blog research (what little there is) and preparing our own research study to find out how blogs could be used as a successful marketing tool.

After initial research, we theorize that there is a curvilinear relationship between the success of a blog and the amount and quality of the blog's interactive features (i.e., pictures, videos, commentary, new information). While too few features and little relevance would result in poor communication, too many interactive features may hinder users from using the blog website. We set out to show that the appropriate balance of features and relevance would result in a "successful" blog (as deemed by readers), and thus an effective marketing tool for upcoming Disney movies.

Our method of research is an online survey administered to over 50 students and 20 adults. Subjects will be exposed to one of three treatments representing blogs with low, medium, and high levels of interactive features. Respondents will provide attitudinal measures regarding the blogs and differences will be analyzed and reported.

Note: The survey & treatments may be viewed here:
http://baylor.qualtrics.com/SE?SID=SV_1C9RB9nFHLgVknq&SVID=Prod

Ben Rodgers, Senior, Marketing
Bobby Shriver, Junior, Marketing
Faculty Mentor: Dr. Kirk Wakefield

Title: *Online Entertainment Hub: A Concept Test and Measure of Consumer Response*
(Department of Marketing)

Based upon a request from Disney Studios and Word Records, we developed an original online service concept used to communicate information regarding releases through a social networking site. We test the desirability of a website that creates a centralized hub from which users may gain information on music and entertainment subjects.

Users of this central hub entertainment website will be able to customize by user account preferences to receive updates and provide direct input on customer reviews of movies, music, video games, and other entertainment. The main idea is that users receive customer reviews ("92% Like New Coldplay CD") based on their recorded preferences and interests.

Using an online survey describing the online service in full, we determine likely user response to the following customizable facets for users based on their preferences and selection when developing their account:

- Category Preferences—genres of music, movies, games, and entertainment
- Media Preferences—what media sources should be used to populate the hub
- Personalized distribution—choice of dissemination of information via website or email
- User Input—providing reviews and ratings of movie, music, and game releases
- Social Network—connecting to others with similar entertainment interests

We also measure other individual differences that might influence user preferences, including: Entertainment "Pickiness," Involvement, Variety, Expertise, Involvement, and Time Pressure. Our method consists of an online survey distributed to over 50 students and adults (see http://baylor.qualtrics.com/SE?SID=SV_8CU6UWkfub94Js8&SVID=Prod). Results will be reported to Disney and Word Records at the end of the term.

Bill Daniel Student Center
Fentress
April 27, 2009 * 2:00 - 3:00 p.m.
Continued

Kristina Smith, Junior, Marketing
Melissa Limmer, Senior, Marketing
Faculty Mentor: Dr. Kirk Wakefield

Title: *Consumer Response to Pop-up vs. Banner Ads*
(Department of Marketing)

Our research tests the effect different forms of online advertising have on recall, recognition, emotion, and behavior. We hypothesize that pop up advertisements have higher recall and recognition but increase frustration and decrease trust. In contrast, we expect banner advertisements have lower recall and recognition but positive emotional and behavioral responses. In particular, we seek to understand which type (banner, pop-up, or both) leads to recall of an otherwise identical advertised offer of an artist's music release.

Using over 50 student subjects, our online surveys feature different screenshots to test our hypotheses. (See http://baylor.qualtrics.com/SE?SID=SV_6PeW7AD0yZnBXDe&SVID=Prod.) Our screenshots of an identical homepage are manipulated to include: only a banner advertisement, only a pop-up ad, both a pop-up and banner ad, and no music advertisement at all. Subjects were randomly exposed to one of the screenshots of the manipulated website. Unaided and aided recall was measured. Unaided recall questions required the respondent to type in what they recall advertised. Aided recall questions required the respondent to select the advertisements they remembered from a list of popular and similar advertisements.

Additional measures collected data regarding the subject's willingness to act upon various ad types. We also measured emotional responses toward the different ads; particularly frustration, stress, and overall attitude. We intend to determine which form of advertisement is more effective, which form people are more likely to act upon, and which form of advertisement people have positive feelings towards. The results would be beneficial to the music industry in making effective online advertisements.

Bill Daniel Student Center
Fentress
April 27, 2009 * 3:00 - 4:00 p.m.

Garrett Burnett, Junior, Marketing
Mandi Jones, Senior, Marketing
Faculty Mentor: Dr. Kirk Wakefield

Title: *Optimal Listening Time for Music Downloads and Factors Influencing Purchase*
(Department of Marketing)

The music industry is an ever-changing business. Online purchasing has revolutionized the way that music is distributed and purchased. Through searching for an answer to the ongoing problem of illegal downloading, we hope to find ways to shift illegal downloads into legal purchases.

We formulated a study based upon music sampling and its relationship to consumer purchase behavior. Based upon the music sampling we seek to determine the optimal length of time needed to listen to a sample before a purchase decision can be made. Our online survey (see http://baylor.qualtrics.com/SE?SID=SV_5sSIPJ8tXGNOK7i&SVID=Prod) measures the length that a potential customer voluntarily listens to the song before making a decision. The listener will be randomly exposed to one of three original songs. The length of time the listener spends listening to the specific song is measured. Questions following probe to collect the listener's thoughts, attitudes, and purchase intentions regarding the song.

Our hypothesis is the longer a listener is exposed to a song that is aligned with the listener's interest the more likely they will be lead to a purchase behavior. The survey measures music quality factors that could influence purchasing behavior: voice quality, lyrics, chorus, instrumentals, and tempo. We also measure how the listener's values align with the lyrics from the music, as well as other factors that may influence choice. Future research should seek to measure where the optimal placement of a "sample listening" would be within the song (open, chorus, end).

Sarah Leyda, Senior, Marketing
Natalie Reese, Senior, Marketing
Faculty Mentor: Dr. Kirk Wakefield

Title: *Profiling the Legal and Illegal Music Downloader: Do Personal Ethics and Behavior Match?*
(Department of Marketing)

Understanding the digital music consumption patterns of today's technology literate society brings into question the correlation between the personal ethics of individuals and their on-line behavior. More specifically, what are the individual and ethical characteristics of those who download music legally or illegally?

We developed an on-line survey based on the findings of two scholarly articles. The first article, *Lost in Cyberspace*, used an ethics questionnaire to reveal the behavioral intention of undergraduates involving computers and internet usage. The second article (*Is Music Downloading the New Prohibition?*) demonstrated disturbing perceptions held by college students engaged in music downloading. Our research combines the two studies by asking ethics questions and a similar comparison of case scenarios to reveal participants ethical beliefs and behaviors. Additionally, we measure reported music consumption (downloads and purchases) of the individual, as well as social and other possible influences on downloading choices. The survey was distributed to over 90 students & faculty on at Baylor.

Based on our analysis, we expect to be able to categorize the participants into one of four profiles for ethical and music consumption identity. The four profile attitudes are:

- Feel that downloading is wrong and do not do it
- Feel that downloading is wrong and still do it
- Feel that downloading is acceptable and do not do it, or
- Feel that downloading is acceptable and do it.

Understanding the correlation between ethics and downloading behavior will enable us to effectively profile the legal and illegal music downloader.

Bill Daniel Student Center
Fentress
April 27, 2009 * 3:00 - 4:00 p.m.
Continued

Kate Petusky, Senior, Information Systems

Faculty Mentor: Dr. Hope Koch

Title: *How Companies Can Strategically Leverage Social Networking Sites for College Recruiting*
(Department of Information Systems)

Since 2003, social networking sites have gained popularity and are now penetrating society's mainstream. Social networking sites include Facebook, MySpace and LinkedIn. These sites allow people to connect to anyone around the world and share insights, experiences and photos. While college students mostly use social networking sites to stay in touch with friends, this research investigates if and how companies can use social networking sites to recruit college students to work in their organizations. We conducted this research using case and survey methods. We interviewed corporate professionals and students to gain insight into how they are currently using social networking sites in recruiting and job search. We designed and administered a survey to gain further insights into this question. Our findings indicate that companies will benefit by incorporating social networking sites into their recruiting practices. Most students said they would prefer looking for a job through a social networking site rather than traditional methods. Based on our research, we develop recommendations for how companies can incorporate social networking sites into their college recruiting practices.

Bill Daniel Student Center
Fentress
April 27, 2009 * 4:00 - 4:45 p.m.

Kaitlin Fogelsong, Junior, University Scholars

Faculty Mentor: Dr. Xin Wang

Title: *Sino-French Relations in the 20th and 21st Centuries: An Evolving Bicultural Relationship*
(Honors College)

The latter half of the 20th century and the beginning of the 21st century have been an eventful period in the history of Sino-French relations. Both the Chinese and French governments underwent significant changes in the mid-20th century: Charles de Gaulle's establishment of the Fifth Republic profoundly affected the French government, whereas, in China, Mao Zedong's Cultural Revolution radically altered the Chinese government. These two nations reestablished political ties in 1964, and, since then, their relationship has seen many significant developments. By tracing the history of this transnational relationship, it becomes evident that it is a story of not only challenges, but also the development of bicultural understanding. Given the ever-evolving state of Sino-French relations, this paper seeks to examine exactly how that relationship has grown over the course of the past 60 years.

Kirsten Appleyard, Senior, University Scholars

Faculty Mentor: Dr. David Jeffrey

Title: *"Moi je vis un peu avec les anges": The search for the Good in the Contemporary Art of Arcabas*
(Honors College)

In a largely post-Christian age of painting there has surfaced a Catholic artist of considerable inherent interest, both aesthetic and theological. Lauded as one of the masters of contemporary sacred art, Arcabas is rapidly emerging to prominence in his native country of France; he is as yet, however, largely unknown in North America. This essay will provide a brief introduction to the artist and his work, observing in particular how Arcabas is situated in and at the same time departs from the modern art tradition through thoughtful theological engagement with the three transcendentals, namely the True, the Good, and the Beautiful. A focused examination of Arcabas's pursuit of the second transcendental will show how his conception of the good of art is rooted in a distinctly Christian understanding of artistic endeavor; that is to say, Arcabas allies himself with Saint Augustine, Saint Thomas Aquinas, among others, in believing that art is a living word – a means of teaching others about Christ, of celebrating the mystery of the incarnation and its implication for man, and of promoting contemplation and rousing viewers to a higher appreciation and gratitude. For Arcabas, art is good insofar as it is derivative of the One who is all Goodness; this view becomes even more apparent when the artist's paintings are compared with those of near contemporaries in recent European painting.

Bill Daniel Student Center
White
April 27, 2009 * 12:00 - 1:00 p.m.

Erin Pedigo, Senior, Journalism, History minor

Faculty Mentor: Dr. Keith Francis

Title: *The East India Company Under Oliver Cromwell*
(Department of History)

My paper speculates on why Oliver Cromwell renewed the English East India Company's charter in 1657, when it is known he didn't even record this action in his diaries. This lack of attention to the charter renewal allows for speculation in an economic, political, and religious framework.

Sara Kincaid, Sophomore, History

Faculty Mentor: Dr. Keith Francis

Title: *The Importance of Etiquette: Calling and the Middle Class*
(Department of History)

I am writing about calling etiquette in middle-class Victorian England; that is, how members of the middle class visited each other. This paper will include all the rules and procedures for calling during the Victorian period and will compare calling with other types of Victorian etiquette. I will show how calling reflected the status of middle-class women in England.

Michael Sturdy, Senior, History and Religion and is in the BIC Program

Faculty Mentor: Dr. Thomas Kidd

Title: *Anti-Catholic Rhetoric in the Work of Jonathan Edwards*
(Department of History)

Jonathan Edwards is known as the preeminent theologian of Colonial British America. He is known in the popular mindset for his fiery sermons that called for the "conversion experience." It is Edwards' work in eschatology, however, that is the focus of this paper. In this essay, Edwards' use of Anti-Catholic rhetoric, which features prominently in Edwards' understanding of both the book of Revelation and world events, will be studied. The Protestant-Catholic wars that had ripped through Europe were no less real in the New World. Added to this, Edwards' own family experience with Catholicism lies in the background of the writings of Jonathan Edwards. These personal experiences, combined with Edwards' own stringent Calvinism, contributed to an atmosphere of Anti-Catholicism in the future United States that would last for many years to come.

Bill Daniel Student Center
White
April 27, 2009 * 1:00 - 2:00 p.m.

Ariana Phillips, Senior, Pedagogy
Faculty Mentor: Dr. Robin Wallace
Title: *The Sublime Chopin*
(Department of Academic Studies)

Although it has faded into semi-obscurity in the last century, the sublime is an aesthetic concept commonly applied to music by Handel, Haydn, Mozart and especially Beethoven during the late-18th and early-19th centuries. This research first traces the development of the sublime in both music and philosophy in order to determine criteria for musical sublimity. Then, selected works of Frédéric Chopin are compared to these criteria in order to determine whether they may also be considered sublime. Detailed analysis of the Prelude in A minor, Op. 28, no. 2, the B minor Scherzo, Op. 20, and the B-flat minor Sonata, Op. 35 reveals that these works by Chopin utilize some of the sublime gestures found in earlier works. More importantly, they evoke the same types of reactions from their audiences as the earlier sublime works did. Based upon this evidence, this thesis argues that although these works do not exhibit the overwhelming sonic power characteristics of the sublime they are equally as sublime as the works of Handel and Beethoven.

Juan R. Flores, Senior, Instrumental Music
Faculty Mentor: Dr. Timothy McKinney
Title: *Understanding the Trio Sonata Through Reconstruction*
(Department of Academic Studies)

One of the most popular genres of the Baroque period of music was the trio sonata. Trio sonatas were scored for two treble instruments and "basso continuo," a special type of accompaniment where a keyboard instrument, like the harpsichord, played a composed, continuous bass line under an improvised harmony in the treble. (The performer knew what chords to play by figured bass symbols notated above the bass line.) Usually, this bass part was doubled by a bass instrument like the cello or the bassoon.

These pieces were found in two styles, both named for their performance location. Sonatas da chiesa were "of the church" and usually featured four movements in a slow-fast-slow-fast arrangement. Sonatas da camera were chamber based pieces written in the style of a dance suite, often with an introductory prelude.

This presentation will focus on the construction of the trio sonata da camera. Form and common compositional techniques like sequence, inversion, and chain suspensions will be discussed through the analysis and performance of an original composition by the presenter in the recreated style of a trio sonata da camera.

Bill Daniel Student Center
White
April 27, 2009 * 2:00 - 3:00 p.m.

Shelby White, Senior, Language and Linguistics

Faculty Mentor: Dr. Gardner Campbell

Title: *The Delicious Library*
(Honors Program)

When one thinks about education and technology, one often thinks about the modern day school system and various types of learning software such as Leapfrog. What one often fails to think of is often one of the most subtle and most powerful forms of learning: internet tags. As Bush mentions in his essay "As We May Think", forming an associative trail is often the best way for a learner to see both where he has come from, and where to move towards. One of the best tools available for forming these trails is through social bookmarking in websites such as delicious.com. On these websites, users "tag" specific websites that the delicious.com saves for future reference. The tag is a type of keyword that the user associates with that site. Tagging seems simple, but it is more than that. It serves as both a mental and physical hyperlink, connecting the user to the ideas of other internet taggers. However, the unseen power of tagging is that of the recommended and popular tags that delicious.com suggests to the user when he is tagging a website. By showing suggested tags, the user is then able to create multiple associations that he would not previously have thought of. These tags make sense to the user, but they do not originate with him. Furthermore, these suggested tags suggest new approaches and relevance to old material. Something the user thought he already understood gains new meaning and a new tag. Tagging establishes a trail, not only for the individual, but for everyone. Each user can follow the trail to new learning just through something as seemingly simple as the tag.

Philip Heinrich, Freshman, University Scholars

Faculty Mentor: Dr. Gardner Campbell

Title: *The Mother of All Demos*
(Honors Program)

On December 9, 1968, computer scientist and inventor Douglas Engelbart presented a demonstration of emerging computer technology that would later become known as "The Mother of All Demos." In this videotaped presentation, Engelbart exhibited the first public demonstration of a computer mouse, video conferencing, hypertext, and a system similar to email. Much of this technology would not come into popular use for decades afterward, yet Engelbart has received little recognition for his work in computers, which was very far ahead of his time and on some levels surpasses technology available today.

In this video presentation created as part of Dr. Campbell's "New Media Studies" course. I have set highlights from the narration of Engelbart's original demonstration to new, original video and animation to bring an added level of meaning and draw parallels to modern advances in technology. In addition to the video presentation, there will be supplementary information on the work of Engelbart and others at the forefront of the New Media community.

Arturo Angel Espinoza III, Freshman, Biology

Faculty Mentor: Dr. Gardner Campbell

Title: *New Media - Fantics*
(Honors Program)

The presentation will consist of my work with the online community Flickr. I have joined a group focused on visual story telling that contains a 5 frame limit. Within this group, members post their pictures with a title and leave the interpretation open to the users. During the presentation, I will present several of my own stories/contributions and will focus on how new media has affected the way we see and experience the world with others. Fantics describe how the information is presented in a way that interests the audience and leads into the Web 2.0 debate and how technology is affecting the way we learn.

Bill Daniel Student Center
White
April 27, 2009 * 3:00 - 3:30 p.m.

Scott Ruhnau, Junior, Physics

Faculty Mentor: Dr. Jay Dittman

Title: *High Energy Physics at the Collider Detector at Fermilab*
(Department of Physics)

This summer I worked with the Baylor Experimental High Energy Physics group which is engaged in research at the Fermi National Accelerator Laboratory (Fermilab) in Batavia, Illinois. At Fermilab, protons and antiprotons are accelerated to nearly the speed of light by the Tevatron, the most powerful particle accelerator in the world. Beams of protons and antiprotons collide at the center of the Collider Detector at Fermilab, a massive 5,000-ton particle detector. Data recorded from these energetic collisions help physicists to identify the properties of the elementary particles that constitute the universe.

One essential element of the experimental apparatus, the eXtremely Fast Tracker (XFT), has recently been upgraded, and additional assistance was needed to improve the system by adjusting timing constants in the electronics. This summer I traveled to Fermilab for ten weeks. During the summer internship, I experienced the world of high energy physics at Fermilab, learned about the XFT system in detail, and participated in the design and implementation of enhancements to the XFT system.

Bill Daniel Student Center
White
April 27, 2009 * 3:30 - 5:00 p.m.

Kevin Farquhar, Sophomore, Biology
Faculty Mentor: Dr. Tamarah Adair

Title: *Determination of Oxacillin Minimum Inhibitory Concentrations for MRSA Isolates*
(Department of Biology)

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a nosocomial pathogen world-wide, but outbreaks have also been reported among risk-free individuals in a community setting. Not only can MRSA cause serious health problems but also can colonize an individual's anterior nares without causing disease. In a study documenting the prevalence of *Staphylococcus aureus* and MRSA among the students at Baylor University, nasal swab specimens were isolated and microbiologically tested for the presence of *S. aureus*. MRSA isolates were identified by testing for oxacillin resistance. During a two year period, the study found ten participants colonized with MRSA.

Qualitatively, oxacillin-resistance patterns were previously determined by the Kirby-Bauer disc diffusion method. This study used a quantitative method (Etests) to determine the minimum inhibitory concentration (MIC) of each strain. Oxacillin Etest strips were placed on Mueller-Hinton agar plates inoculated with each strain. The MICs were recorded after 24 hours of incubation at 35 °C.

There were no susceptible isolates with an MIC <4 µg/ml, the CLSI MIC criteria defining an oxacillin resistant phenotype. MRSA isolates 1304 (4 µg/ml) & 1252 (64 µg/ml) had the lowest and highest oxacillin resistance respectively.

Amanda Hartman, Senior, Biology
Faculty Mentor: Dr. Tamarah Adair

Title: *Evaluation of Methicillin-Resistant Staphylococcus aureus (MRSA) Nasal Colonization in Veterinary Population*
(Department of Biology)

The CDC estimates that 1–3% of Americans carry MRSA in their nasal passages. These individuals are capable of passing MRSA on to others through direct contact. It has been reported that MRSA transmission can occur between animals and humans. Veterinarians have close contact with a variety of different animal species. This project evaluates prevalence of MRSA carriage among veterinarians, veterinary technicians, and others samples at a veterinary medicine conference in Fall 2008. Nasal swabs from participants were cultured on mannitol salt agar plates. Isolates that were mannitol fermenters, coagulase positive, catalase positive, and gram-positive cocci, were presumed to be *Staphylococcus aureus*. The Kirby-Bauer method was used to analyze the antibiotic sensitivity profiles of each *Staphylococcus aureus* isolate. Surveys completed by each individual were used to evaluate various criteria identified by the researcher as potential risk factors for *Staphylococcus aureus* carriage. Information from the surveys was evaluated using JMP statistical program. Of 276 participants, 142 (52%) were veterinarians or veterinary students. Of these, 28 (20%) harbored methicillin sensitive *Staphylococcus aureus* (MSSA) and four (2.85%) carried MRSA. Veterinary technicians or veterinary technician students comprised 102 (37%) of the participants. In this group, 12 (11.76%) carried MSSA and 12 (11.76%) harbored MRSA strains. The remaining 32 (11%) participants had other roles connected to veterinary practice. One individual was colonized with MRSA (3.12%) and 8 (25.0%) carried MSSA. Overall, 48 individuals (17.6%) harbored MSSA and 17 (6.25%) were colonized with MRSA. The MRSA carriage rate in the veterinary technician group was four times higher than that of the veterinary population. One family member of a veterinary technician tested positive for MRSA, and both antibiograms were identical. Veterinary practice type was not found to be correlated with colonization.

Andrew Volk, Senior, Biology
Faculty Mentor: Dr. Tamarah Adair

Title: *Colony interactions Between Methicillin Resistant Staphylococcus aureus and Staphylococcus epidermidis*
(Department of Biology)

Staphylococcus aureus is a commensal organism that is carried in the sinus cavities as normal body flora by 25%-30% of the United States population. If these bacteria are allowed to leave the sinus cavity and enter the mucus membranes or blood stream, they can cause very dangerous illnesses. These bacteria are highly virulent, and lately have been developing resistance to antibiotics at an alarming rate, with many strains originally showing resistance to methicillin, and now with strains also showing resistance to vancomycin. It is clear that a new treatment method is required to prevent this pathogen from infecting and killing without control. This experiment uses flow cytometry and fluorescent microscopy to study the colony interactions between two different strains of methicillin resistant *S. aureus* to the common human body commensals *Staphylococcus epidermidis* and *Micrococcus luteus*. A better understanding of how these organisms inhibit and compete with each other will lead to new treatment programs of *S. aureus* infections without the use of antibiotics.

Bill Daniel Student Center
White
April 27, 2009 * 3:30 - 5:00 p.m.
Continued

Ayla Farris, Senior, University Scholar
Faculty Mentor: Dr. Tamarah Adair

Title: *Evaluation of SCCmec types for Methicillin-Resistant Staphylococcus aureus Strains Isolated from Healthy Carriers*
(Department of Biology)

Background: The elucidation of healthy carriers of Methicillin-Resistant Staphylococcus aureus (MRSA) and their role in disease transmission may contribute to our understanding of the interrelationship between hospital acquired (HA) and community associated (CA) MRSA. The purpose of this study is to determine the SCCmec types for MRSA strains isolated from healthy carriers.

Methods: Nasal swabs were isolated from 1,214 undergraduate students. Mannitol salt agar (MSA) was used for primary isolation of cultures. Up to 3 isolates from each MSA plate were transferred to tryptic soy agar. The Kirby-Bauer method was used to determine the antibiotic sensitivities of each Gram-positive, catalase-positive, coagulase-positive isolate. Oxacillin resistant isolates were stored using cryobeads and isolates were later sub-cultured for analysis. DNA was extracted from 3 ml of overnight growth. Polymerase chain reaction (PCR) was performed on the extracted DNA using a multiplex PCR assay with primers specific for with the mecA and ccr complexes.

Results: Of the 1,214 undergraduates, 232 (19.1%) harbored S. aureus including 10 (0.82%) individuals with MRSA isolates. 9 isolates are Type IV MRSA and one is Type II MRSA.

Conclusion: Young healthy carriers are harboring various strains of MRSA which reflect both HA-MRSA and CA-MRSA. Future studies will analyze risk factors associated with carrier status.

Baylor Sciences Building
Atrium
April 28, 2009 * 12:00 - 2:00 p.m.

Board 1

Alex Millard, Senior, Anthropology
Faculty Mentor: Professor Carol Macaulay

Title: *A Look at Food Resource Exploitation at a Late-Prehistoric Campsite in Central Texas: Subsistence Activities at the Upper Sprague Site, Hamilton County, Texas (41HM54) Part 1: Freshwater Mussels*
(Department of Anthropology, Forensic Sciences & Archaeology)

For two field seasons, Baylor University students have been working at the Upper Sprague site, Area D, and have exposed a living surface dating to the Late Prehistoric Period (AD 800-1500). Twenty-nine 1x1 meter units have been excavated to date and have revealed nine intact features, most of which represent the processing of food resources and the disposal of the remains. This poster presents a description of the freshwater mussels species recovered and an analysis of the subsistence value of the assemblage. Species were identified, fresh meat weight was calculated, and dietary and nutritional values were determined and compared to other food resources found at the site. The analysis suggests that freshwater mussels were an important staple for the inhabitants of the site. Evidence for this is based on the quantity recovered, ease of procurement at this locale and the high levels of dietary calcium and iron they provide.

Board 2

Shamara Sneed, Senior, Anthropology
Faculty Mentor: Professor Carol Macaulay

Title: *A Look at Food Resource Exploitation at a Late-Prehistoric Campsite in Central Texas: Subsistence Activities at the Upper Sprague Site, Hamilton County, Texas (41HM54) Part 2: Fauna*
(Department of Anthropology, Forensic Sciences & Archaeology)

For two field seasons, Baylor University students have been working at the Upper Sprague site, Area D, and have exposed a living surface dating to the Late Prehistoric Period (AD 800-1500). Twenty-nine 1x1 meter units have been excavated to date and have revealed nine intact features, most of which represent the processing of food resources and the disposal of the remains. This poster first presents the identification of taxa and the NISP within the faunal assemblage. Second, since ninety-six percent of the assemblage could not be assigned to a taxon due to the high level of fragmentation; the fragmentation process had to be understood. Fragmented bone in an assemblage suggests that bone fat extraction activities took place. Applicable data from experimental studies on bone marrow and bone grease extraction is presented here. Attributes of bone fragmentation observed include fragment size, types of bones fragmented and levels of fresh fracture vs. post-depositional fragmentation.

Board 3

Morgan Haley, Senior, Anthropology
Faculty Mentor: Professor Carol Macaulay

Title: *A Look at Food Resource Exploitation at a Late-Prehistoric Campsite in Central Texas: Subsistence Activities at the Upper Sprague Site, Hamilton County, Texas (41HM54) Part 3: Pecans*
(Department of Anthropology, Forensic Sciences & Archaeology)

For two field seasons, Baylor University students have been working at the Upper Sprague site, Area D, and have exposed a living surface dating to the Late Prehistoric Period (AD 800-1500). Twenty-nine 1x1 meter units have been excavated to date and have revealed nine intact features, most of which represent the processing of food resources and the disposal of the remains. Since the site is located on a river terrace covered with groves of pecans (*Carya illinoensis*), it is suggested that the occupants of the site took advantage of the mast production of native pecans growing along this terrace of the Leon River. This poster presents a compilation of data from various sources to support this premise despite the fact that no physical remains of pecans have been recovered at the site. Botanical information on pecans, nutritional value of pecan nutmeat, ethnohistoric and modern ethnographic accounts of gathering and processing nuts of the hickory genus is presented.

Board 4

Cynthia Castillo, Senior, Anthropology

Jessica Wilson, Senior, Anthropology

Faculty Mentor: Dr. Garrett Cook

Title: *Comparative Business Models: Daily Food Vendors and Market Day Vendors in Momostenango*
(Department of Anthropology, Forensic Sciences & Archaeology)

In July of 2008, data on two food vending businesses operating in the rented stalls in the outdoor market in the Maya village of Santiago Momostenango were collected through participant observation and interviews. The research attempted to define some general shared patterns in the microculture of the food vending business while also seeking to identify the range of variation characteristic of business models in this indigenous market by selecting one vendor who provides food everyday and another who works only on the two major market days every week. The communities' traditional food preferences define a standard menu, and both businesses are run entirely by women and employ only women. Food preparation which takes place in home or rented kitchens off-site begins at 3PM and ends at 1AM, while food service is from 6AM or earlier until 2 or 3 in the afternoon. Food is transported in batches from the kitchen to the market. The costs and the profits varied between the two businesses, with daily costs and profits (margins of 52% vs. 63%) higher for the two days/week vendor.

Board 5

Sadaf Rafique, Senior, Biology

Amanda Brown, Senior, Anthropology

Faculty Mentor: Dr. Garrett Cook

Title: *Public Health in Momostenango, Guatemala*
(Department of Anthropology, Forensic Sciences & Archaeology)

In the summer of 2008, our research consisted of interviewing various people in the public health field in Momostenango, Guatemala, a city that lies in the state of Totonicapan. Momostenango is located in the highland region of Guatemala in an area that the people refer to as Tierra Fria because of the cold temperature that is present year round. Momostenango lies at an elevation of an average of 8,000 feet above sea level and has a population of around 100,000 people. Data that we have gathered from three doctors, two pharmacists, a social worker at the main public health center, a medical student working at the same center, and a Peace Corps volunteer who teaches health in the local schools and is working on a health program, has led us to believe that there is no single source of public health problems. Rather, there are several different factors contributing to the common ailments that the local Mayans have faced for years. There are three main factors contributing to the public health of Momostenango: poverty, contaminated water and a cold and damp climate. While 85% of the children are vaccinated against tuberculosis, meningitis, tetanus, polio, rubella, diphtheria, influenza, and measles, none of these combat colds, flu, parasites, bronchial infections, nor malnutrition.

Board 6

Scott Taylor, Senior, Anthropology

Emily Pasterchick, Senior (Dec. Grad), Anthropology

Faculty Mentor: Dr. Garrett Cook

Title: *The Cult of the Patron Saint and the Renewal of Maya Religion*
(Department of Anthropology, Forensic Sciences & Archaeology)

Fieldwork conducted in Santiago, Momostenango in 2008, focused on the ceremonies honoring the Patron Saint, Santiago, and a married couple who recently have shown interest in the cult of the Patron Saint. Don Selvin was raised Mormon but after many life struggles, including a long standing fight with alcoholism and a few near fatal accidents, converted to the new, pure Maya religion. His wife, Dona Alejandrina, was raised in a Catholic family. After an extensive ailment, she sought out a Mayan spiritual guide and then converted to a Costumbrista faith. Costumbristas combine Mayan and Catholic beliefs in an animistic religion. "Nawales," spirits that animate objects and places, play a large role in Mayan and Costumbrista beliefs.

Board 7

Lela Berry, Senior, International Studies

Faculty Mentor: Dr. Sara Alexander

Title: *Linking Education and Resilience: Women's Responses to Climate Change in Coastal Communities in Belize*
(Department of Anthropology, Forensic Sciences & Archaeology)

Women in developing countries typically have lower levels of education, less diverse diets, poorer health, and less access to resources necessary to pursue desired livelihoods. As such, female-headed households are generally more vulnerable to livelihood insecurities, and thus climate-related disasters. Conversely, when women do have an education and work outside the household, they are more secure in their livelihoods and better able to respond to stressors and shocks. One link between education levels and women's responses are their perceptions about weather patterns. Since

these perceptions strongly influence their behavior, this study analyzes women's assessment of weather events and associated risks as they influence their responses. Using data from three coastal communities in Belize, this study asks whether women's perceptions about climate change, and their coping strategies in response to recent climate-related events, differ by levels of education. Are women who have higher levels of education more secure in their livelihoods? And if so, do these women differ in their responses to climate shocks than less-educated women? The specific objectives of this presentation are threefold: (1) to identify education levels of women in three Belizean communities, (2) to evaluate their perceptions about recent changes in weather patterns, and (3) to explore relationships between education, weather perceptions, and women's responses to climate events.

Board 8

Jason Scovell, Junior, Baylor Business Fellows

Faculty Mentor: Dr. Bryan Gibbon

Title: *Characterization and Identification of Protein Body ER-Associated Proteins*
(Department of Biology)

Maize is an important protein source in many developing countries especially in Central America and Africa and a major source of feed in the US. The discovery that certain mutants of maize, especially opaque2, have a positive effect on nutritional value led to the development of Quality Protein Maize. However, mutants with the opaque phenotype are susceptible to damage from pests and disease as a result of their soft, starchy kernels. The FL1 gene encodes a novel membrane protein that resides in the ER membrane surrounding the protein body (Holding et al. 2007). This protein participates in protein body formation by facilitating the localization of 22-kD α -zein between the γ -zein-rich periphery and the core of the protein body. Furthermore, it is essential for the vitreous endosperm formation. We hypothesize that other proteins on the surface of protein body ER that are not present in the cisternal ER play a role in the development of the protein body. These proteins may affect the phenotype by altering the cross-linking structure of the zein proteins. We have begun to investigate this by cell fractionation of the maize endosperm on discontinuous sucrose gradients and analyzing the differences in protein composition among the fractions. Once these proteins have been identified, their function will be investigated in wild type and opaque endosperm maize lines. This work was supported by an Undergraduate Research and Scholarly Achievement grant from Baylor University and a Biology Summer Undergraduate Research Fellowship.

Board 9

Richard Longoria, Senior, Biology and Biochemistry

Faculty Mentor: Dr. Tamarah Adair

Title: *MRSA, Who is at Risk?*
(Department of Biology)

Background: *Staphylococcus aureus* has become a constant concern for many medical professionals because of the antibiotic resistance that it has acquired. It has become resistant to a large proportion of commonly used β -lactam antibiotics. MRSA is categorized as Hospital or Community-Associated, based on the epidemiology. To curb the transmission rates it has become necessary to discover which of various groups of people may be considered at a higher risk than others. If one can be found, then it will be necessary to educate the constituents of that group of their heightened risk.

Purpose: The purpose of this project is to determine if there are any risk factors associated with nasal colonization of *S. aureus* in a healthy college population.

Methods: Pearson's χ^2 and the Odds Ratio tests were used to determine any correlation between carrier and non-carrier status with various risk factors.

Results: From these data collected, nothing can be statistically attributed to such groupings as age, gender, hospital exposure, pets, etc. The only statistically significant variable was whether a person reported him/herself as having an infection with additional risks and exposures. This yielded a p-value of 0.0469 and a calculated Odds Ratio of 1.828.

Conclusion: Nothing can be assumed from these data as to whether any person of any certain classification can be considered as a factor of high risk. The only correlation found suggests that a person is nearly twice as likely to be a carrier if he/she has reported an infection with additional risks and exposures.

Board 10

Kiana Parker, Senior, Biology

Faculty Mentor: Dr. Tamarah Adair

Title: *The Prevalence of Staphylococcus aureus (SA) and Methicillin-Resistant Staphylococcus aureus (MRSA) in a Canine Population*
(Department of Biology)

Background: Methicillin-Resistant *Staphylococcus aureus* (MRSA) is a gram-positive bacterium that has the ability to cause severe skin infections, necrotizing pneumonia, osteomyelitis and septic shock. The CDC estimates that 25-30% of the U.S. population harbors *Staphylococcus aureus* in their nasal passages and anywhere from 1-3% harbor MRSA. Currently, there are rising concerns in regards to animals, especially domestic animals, acting as reservoirs for *Staphylococcus aureus*. Many cases have been documented showing evidence of human to animal and animal to human transmission. The purpose of this experiment was to obtain a percentage of *Staphylococcus aureus* and MRSA in a canine population.

Methods: During this experiment, 101 samples were collected from a canine population at a local veterinary clinic. These samples were plated on Mannitol Salt Agar and checked for fermentation after 24 and 48 hours. Up to three isolated colonies that fermented were transferred to Tryptic Soy Agar plates. Gram-staining, catalase and coagulase tests were then performed and recorded. If all tests were positive, they were plated onto Mueller-Hinton Agar and antibiotic resistance was tested on 12 antibiotics.

Results: Nasal colonization rates for these canines were 40.59%. The three main antibiotic resistant patterns in this population were sensitivity to all 12, sensitivity to only penicillin, and sensitivity to penicillin and SXT.

Conclusion: The carriage rates for SA in canines are higher than the U.S. population. The SXT resistance is more common in a canine population.

Board 11

Brooklyn Sandvall, Senior, Health Sciences Studies

Faculty Mentor: Dr. Tamarah Adair

Title: *Small-colony variant triclosan resistance in methicillin-resistant Staphylococcus aureus*
(Department of Biology)

Staphylococcus aureus uses many ways to resist antibiotic treatment. One of these is the formation of small colony variants (SCVs), which is linked to chronic, recurrent, and persistent infections. SCVs are characterized by slow growth, pinpoint colonies, gram positive cocci, decreased pigment formation, and low coagulase activity. Triclosan, a common biocide used in many domestic and healthcare settings, has been recently linked to resistance in some methicillin-resistant *Staphylococcus aureus* (MRSA) strains. Recent studies have shown that triclosan can induce some strains of MRSA to form SCVs. This study investigated the ability of ten strains of MRSA isolated from the nasal passageway of healthy carriers to be induced by triclosan to form small colony variants. MRSA strains were grown in 10 mL Mueller-Hinton broth to mid-log phase at 37°C. Then, a triclosan solution (1000 mg/L) was added to achieve a final concentration of 0.01 mg/L, and further incubated for 6 hours at 37°C. Cells were collected by centrifugation (5000 rpm for 15 minutes), washed and resuspended in 10 mL of Ringer's solution. Cells were then spread onto plates of Mueller-Hinton agar containing 0 and 10 mg/L triclosan. Plates were incubated for 72 hours at 37°C and analyzed for the presence of SCVs. These colonies were then transferred to Mueller-Hinton agar plates containing 1mg/L triclosan.

Board 12

Ly T. Nguyen, Senior, Biology

Faculty Mentor: Dr. Tamarah Adair

Title: *Antibiotic Resistance of Staphylococcus aureus Isolates from Healthy Comers*
(Department of Biology)

Staphylococcus aureus is part of the normal flora, existing on surfaces such as the nasal passages, skin, and mucus membranes of humans. If *S. aureus* penetrates these barriers, an individual may become infected. Recent studies show methicillin-resistant *Staphylococcus aureus* (MRSA) as an increasing issue, and have been categorized as either community- or hospital-associated. This project tests the prevalence of *Staphylococcus aureus* within a college community, and calculates the resistance patterns of *Staphylococcus aureus* against 12 antibiotics using data from samples taken between Spring 2007 through Spring 2009.

S. aureus identification was based on mannitol fermentation, gram stain, positive catalase and coagulase tests. Twelve antibiotics were then tested against each *S. aureus* sample. Results were categorized by the susceptibility of each *S. aureus* sample to each antibiotic.

Overall, 1214 samples were taken; 232 samples were identified as *S. aureus* (19.11%). Ten samples were identified as methicillin-resistant *S. aureus* (0.82%). Of the 12 antibiotics tested, most isolates were resistant to penicillin (82.32%), followed by erythromycin at 26.29%. Isolates were least likely to be resistant to amikacin, gentamycin, rifampin, and doxycycline—all at 0.43%. All MRSA samples were also resistant to penicillin, 60% showed erythromycin resistance, and 40% neomycin resistance. In conclusion, penicillin has become an almost ineffective antibiotic to use against *S. aureus*. Erythromycin seems to follow the same trend with a majority listed as intermediate. Of those identified as MRSA, there seems to be no unique pattern in antibiotic susceptibility compared to the overall antibiotic susceptibility pattern of *S. aureus* samples.

Board 13

Lynda Hoang, Senior, Biology
Faculty Mentor: Dr. Myeongwoo Lee

Title: *Functional Analysis of conserved tyrosines in β PAT-3 integrin cytoplasmic tail*
(Department of Biology)

Integrin is the $\alpha\beta$ heterodimeric cell surface receptor for extracellular matrix (ECM) and an excellent model to investigate the function of conserved tyrosine (Y) phosphorylation motif, NPXY. The β integrin possesses two NPXY motifs, Y792 and Y804, in the cytoplasmic tail, and the phosphorylation of NPXY mediates interaction to a protein with phosphotyrosine binding (PTB) domain. Cell culture analyses suggested that Y to phenylalanine (F) mutation caused mild defects while Y to alanine (A) abolished cellular function of β integrins. We characterized the activation of NPXY using β pat-3 integrin of the nematode *Caenorhabditis elegans* and generated a tyrosine (Y) to glutamate (E) mutant. β pat-3(Y804E), a transgenic mutant carrying a phosphomimetic mutation in the second NPXY motif of the β pat-3 cytoplasmic tail showed defective muscles, abnormal gonad migration and tail morphology, ineffective mating, and high incidence in male. Some phenotypes of β pat-3(Y804E) parallel those of him-4/hemicentin, an ECM molecule similar to human fibulin-5, leading us to hypothesize that defective him-4 causes phosphorylation in NPXY motifs of β pat-3 cytoplasmic tail. Thus, we introduced the β pat-3 non-phosphorylatable mutation, β pat-3(YYFF), in the him-4 background. Phenotypic analyses of β pat-3(YYFF); him-4 double mutant indicated that β pat-3(YYFF) mutation suppressed ineffective mating, high incidence in male, and egg-laying defects of him-4 males and hermaphrodites. This suggested that one of the functions of him-4/hemicentin is to prevent phosphorylation of β pat-3 NPXY. Further analysis will provide valuable information on the function of NPXY motifs in β integrin regulation and will enable us to interpret integrin signaling in other species.

Board 14

Nathan Grohmann, Senior, University Scholars
Faculty Mentor: Dr. Kevin G. Pinney

Title: *Design, Synthesis, and Characterization of Combretastatin and Benzosuberene Analogues for Potential Use as Vascular Disrupting Agents*
(Department of Chemistry & Biochemistry)

(Co-Authors: Nathan Grohmann, Dr. Madhavi Sriram, Dr. Tracy Strecker, Dr. John J. Hall, Dr. Mary Lynn Trawick, and Dr. Kevin G. Pinney)

The discovery and development of vascular disrupting agents (VDAs) represents a relatively new and exciting area in cancer chemotherapy. VDAs damage existing vasculature in the tumor microenvironment thus starving tumors of necessary oxygen and nutrients. Beyond the cancer field, VDAs also have the potential to be useful in the treatment of certain types of macular degeneration, functioning by selectively damaging the aberrant neovascularization in the retina that is characteristic of this disease. The scope of our current research centers on the discovery of new molecules that demonstrate molecular recognition for the colchicine binding site on tubulin and inhibit the assembly of tubulin into microtubules. In principle, the most effective VDAs will be capable of selectively damaging the microvessels feeding tumors while leaving intact the vasculature feeding healthy tissue. By interfering with the assembly of tubulin into microtubules in the endothelial cells lining tumor vasculature, a sequence of cell signaling events results in morphological changes in the endothelial cells, causing them to go from flat to round, thus blocking blood flow. In this study, we present the design, synthetic route, and initial biochemical and biological evaluation of new benzosuberene analogues and related compounds. The synthetic route involves a unique adaptation of the classic Wittig reaction, as well as a ring cyclization facilitated by polyphosphoric acid. It is our intention that certain of these compounds might be improved VDAs that are beneficial in the treatment of cancer.

Board 15

Matthew MacDonough, Senior, Biochemistry
Faculty Mentor: Dr. Kevin G. Pinney

Title: *Design, Synthesis, and Biological Evaluation of Novel and Potent Thiosemicarbazone Based Cathepsin L Inhibitors*
(Department of Chemistry & Biochemistry)

(Co-Authors: Matthew MacDonough, Dr. Kishore Kumar Gaddale Devanna, Lindsay M. Jones, Grace Yoo, Elizabeth Conner, Dr. Milenka Arispe, Gustavo Chavarrio, Amanda Sevcik, Dr. Mary Lynn Trawick, and Dr. Kevin G. Pinney)

Cathepsin L belongs to the papain family of lysosomal cysteine proteases including cathepsins B, H, S, C, K, O, F, V, X, L, and W. An increase in cathepsin L activity and mRNA production is associated with various cancers including colorectal, melanoma, and prostate. The role that amplified production and activity of cathepsin L plays in tumor metastasis and apoptosis of healthy cells has prompted the search for regulatory mechanisms. A promising approach to limiting cancer metastasis involves the use of effective and selective inhibitors of cathepsin L. The thiosemicarbazone moiety has been recognized as a functional group that interacts with the cysteine residue in the active site of cathepsin L. Accordingly, a variety of novel thiosemicarbazone derivatives based on benzophenone and phenanthrene scaffolds have been designed. Details regarding molecular design and synthetic methodology will be presented.

Board 16

Kaitlin Wheeler, Senior, Biochemistry

Faculty Mentor: Dr. Mary Lynn Trawick

Title: *Biochemical Evaluation of Synthetic Compounds as Cathepsin B Inhibitors*
(Department of Chemistry & Biochemistry)

(Authors: Kaitlin Wheeler, Amanda Charlton-Sevcik, Kishore D. Gaddale, Lindsay M. Jones, Kevin G. Pinney, and Mary Lynn Trawick)

Cathepsin B, an enzymatic protein, is a member of the cysteine protease family. Increased expression of cathepsin B in mammalian cells has been linked to tumor metastasis. Cathepsin B activity is regulated at various biological levels via gene amplification, use of alternative promoters, increased transcription and alternative splicing, leading to increased stability and translation. Development of a potent, specific inhibitor of cathepsin B would be important for research and have promising therapeutic potential. Enzyme activity was determined fluorimetrically by following the release of 7-amino-4-methylcoumarin from the substrate, Z-arginine-arginine-aminomethylcoumarin. A small library of compounds, from the laboratory of Dr. Kevin G. Pinney (Baylor University) was tested for their ability to inhibit the cathepsin B catalyzed hydrolysis reaction. Thusfar, one compound has been found with an IC₅₀ value (concentration of compound that inhibits the enzymatic reaction by 50%) in the micromolar range. Further studies are aimed at discovering compounds with lower IC₅₀ values. The best inhibitors will be further evaluated in cell studies

Board 17

Stephanie Li, Senior, University Scholar

Faculty Mentor: Dr. Mary Lynn Trawick

Title: *Inhibitors of Cruzain as Potential Therapeutic Agents*
(Department of Chemistry & Biochemistry)

(Authors: Stephanie Li, Wara Milenka Arispe, Kishore D. Gaddale, Lindsay M. Jones, Jiangli Song, Kevin G. Pinney, and Mary Lynn Trawick)

Chagas' disease is the third largest parasitic disease worldwide after malaria and leishmania, and currently no satisfactory treatment is available. New chemotherapy is needed to fight the world's parasitic challenge. As a promising target for the development of new chemotherapy, cruzain has received considerable attention in recent studies. Cruzain is the major cysteine protease of *Trypanosoma cruzi*, which is the causative agent of Chagas' disease. Our research aims at finding novel cruzain inhibitors as potential antiparasitic drug candidates. A library of 25 thiosemicarbazone derivatives was synthesized in the laboratory of Dr. Kevin G. Pinney at Baylor University. These compounds were evaluated against recombinant cruzain to explore structure-activity relationships. Cruzain activity was determined fluorimetrically by following the release of 7-amino-4-methylcoumarin from the substrate, Z-phenylalanine-arginine-aminomethylcoumarin. Six compounds were found to have IC₅₀ values in the submicromolar range, and will be evaluated further as potential therapeutic agents.

Board 18

Brittany Bartz, Senior, Elementary Education

Kristin Biggs, Junior, Elementary Education

Laura Bonner, Senior, Elementary Education

Amanda Boyd, Junior, Elementary Education

Laura Cremeens, Senior, Elementary Education

Emily Ford, Senior, Elementary Education

Lacey Melinder, Junior, Elementary Education

Kristen Randolph, Senior, Elementary Education

Faculty Mentors: Dr. Pat Sharp, Ms. Betty Ruth Baker, Dr. Trena Wilkerson, Mrs. Cheri Jennings, Dr. Sandi Cooper, and Mrs. Susan Cooper-Twamley

Title: *Developing Students' Descriptive vocabulary and Comprehension through the Use of Picture Books at Parkdale Professional School*

(Department of Curriculum & Instruction)

At Parkdale Professional Development School, an action research study was used to determine if frequent interactions with quality children's literature would increase students' vocabulary and comprehension. The study involved students in kindergarten through third grade. Researchers included four Baylor interns and twelve teaching associates. At the start of the study, research data was gathered through video observation and analysis of students narrating a wordless picture book entitled "Changes Changes" by Pat Hutchins. Pre-assessment data identified a need for intervention involving rich vocabulary and comprehension strategies. Focusing on one book each week for six weeks, students were provided various engaging interactions with the literature. Intervention strategies included: discussions of vocabulary, interactive retellings of the stories, and opportunities to express vocabulary through writing. Students were post-assessed in the same manner as the pre-assessment, and improvement was evident. Through observations,

student work, and assessment, increases in students' word knowledge and comprehension were noted. Candidates also reported personal gains through lesson planning, reflection writing, and video observation and evaluation.

Board 19

Jordan Sandefur, Senior, Elementary Education

Julie Leary, Senior, Elementary Education

Alison Macari, Senior, Elementary Education

Kimber Fowler, Senior, Elementary Education

Faculty Mentors: Dr. Trena Wilkerson and Ms. Betty Ruth Baker

Title: *Geometric Thinking in Young Children: An International Perspective*
(Department of Curriculum & Instruction)

Geometry is a part of mathematics concerned with size, shape, and relative position of figures and properties of space. Researchers such as Van Heile (1999) and Van de Walle (2004) point to the need to study geometric thinking in young children as a foundation for growth in mathematical understanding. To examine geometric thinking and focus on best practices in instruction, Baylor University teacher candidates studied their teaching practices and investigated the impact on one class of 22 five to six year old children through a study conducted in an infant-primary school in Queensland, Australia during a study abroad program in Fall 2008.

The participants were pre-assessed by using a geometry content interview protocol followed by participating in 5 standards based lessons taught by the teacher candidates. University faculty observed the lessons. Teacher candidates completed anecdotal assessment notes and reflections after each lesson. A post-assessment was conducted to determine changes in geometric thinking.

The purpose of this mixed-methods study was to examine geometric thinking in young children. Research questions were:

1. What do young children know and understand about geometric concepts?
2. How can teachers create a learning environment that supports and strengthens geometric experiences?
3. What instructional strategies are identified as best practices?
4. How can participation in research improve instruction in mathematics?

Findings indicate an increase in student understanding and advancement of language development. Other findings related to the learning environment, effect strategies, and instructional improvement will be shared along with implications for teaching and learning.

Board 20

Haley N. Wasson, Junior, Geology

Faculty Mentor: Dr. Julia Sankey (Visiting Sabbatical Prof)

Title: *The Post-Taphonomic Redistribution of Cretaceous Vertebrate Fossils Within Tertiary Deposits*
(Department of Geology)

The biostratigraphy of the upper Hell Creek Formation and the lower Tullock Formation of McGuire Creek, McCone County, Montana, contain juxtaposed non-avian dinosaurs and early Paleocene mammal fossils, referred to as the Bug Creek assemblages. If interpreted geochronologically by the encasing beds, the resulting data would suggest a temporal overlap (i.e., coexistence) of Cretaceous-aged dinosaurs and Tertiary vertebrates. The Bug Creek assemblages have been used as evidentiary support in contradiction to catastrophic modeling of extinction and faunal turnover at the Cretaceous-Tertiary boundary. Evidence of lacustrine reworking of the fossils, however, indicates deposition within a channel lag. Floodplain deposits of the Upper Hell Creek Formation contain a large number of in situ dinosaur remains. Channel entrenchment caused erosion of Lancian-age Cretaceous sediments. The fossils found within the Bug Creek assemblages are incomplete and not in situ. In addition, Puercan-age Tertiary sediments are intermixed in the channel fill. Palynological studies have determined that the reworked Bug Creek assemblages yield Paleocene-age palynofloras, while the beds containing in situ dinosaur remains are palynologically Cretaceous. This disproves a simultaneous deposition and is evidence of sediment (and fossil) recycling rather than an overlap of Cretaceous and Tertiary fauna.

Board 21

Lisa Turpin, Senior, Geology

Faculty Mentor: Dr. Steve Dworkin

Title: *Grain size distribution and organic matter content of Triassic paleosols in the Chinle Formation, Petrified Forest National Park, Arizona*
(Department of Geology)

A succession of well-preserved paleosols in the Chinle Formation from the Petrified Forest National Park have been investigated for their grain size distribution and organic matter content. Grain size distribution in paleosols has the potential to be used as a proxy for the environmental conditions that the soil experienced because of the increased

production of clay during accelerated pedogenesis. The abundance of organic matter in soils can be used as a proxy for the abundance of vegetation and/or the conditions that control organic matter preservation in soils.

The average Chinle paleosol B-horizon is composed of about 24% clay (<4 μ m), 61 % silt (4 – 62.5 μ m), and 15% sand (62.5 – 2000 μ m). The soils are generally poorly sorted with the exception of paleosols from the Petrified Forest Member that are well sorted. The median grain sizes (d (0.5)) are 17, 28, and 8 microns for the Blue Mesa Member, Sonsela, and Petrified Forest Members respectively. The Sonsela Member paleosols are distinctive because they have the highest average sand content while also having the highest average clay content.

Chinle paleosol B-horizons have an average of 0.03 wt % organic carbon. The Sonsela Member paleosols have slightly less organic carbon (about 0.01 wt %) than paleosols in the other two members. Dispersed calcite is present only in the Petrified Forest Member paleosols where it averages about 10 wt %.

Board 22

Amy Fitzpatrick, Senior, Geology
Faculty Mentor: Dr. Steve Dworkin

Title: *Provenance and Diagenesis of Chinle Formation Sandstones, Petrified Forest National Park, Arizona*
(Department of Geology)

The Late Triassic Chinle Formation is composed of a succession of interbedded overbank and channel deposits. This study undertakes a petrographic investigation of the channel sandstones as a means to better understand the provenance and diagenesis of Chinle sandstones. Sandstones from the lower three members (Blue Mesa Member, Sonsela Member, and Petrified Forest Member) of the Chinle Formation from the Petrified Forest National Park, were collected, made into thin sections, and evaluated petrographically for the abundance of their components and for the effects of diagenesis.

Chinle sandstones are, on average, composed of 54% grains, 11% cement, 32% matrix, and 3% porosity. The most common framework grains are quartz, mudrock fragments, and feldspar. The mudrock fragments are derived from nearby floodplains. The feldspars are dominated by K-feldspar in the Blue Mesa and Sonsela Members and by plagioclase feldspar in the Petrified Forest Member. Chinle sandstones are dominantly sublitharenites and feldspathic litharenites.

The most prominent diagenetic features of Chinle sandstones are compaction and cementation. Compaction of soft mudrock fragments is ubiquitous and in some sandstones is so well developed that it results in an apparent flow texture. Much of the fine matrix in these sandstones may be squashed mudrock fragments. The most common cements are clay minerals and calcite. Clay mineral cements are fibrous and grain-rimming. Calcite cement replaces grains and fills intergranular areas. Plagioclase feldspar dissolution is a less common diagenetic feature that results in oversized pores or is manifested as skeletal feldspar grains in the Petrified Forest Member.

Board 23

Erik J. Snikeris, Senior, Geology
Faculty Mentor: Dr. Steven G. Driese

Title: *The Early History of Oil and Gas Exploration in Texas*
(Department of Geology)

The history of the oil and gas industry in Texas is one of discovery, complexity and innovation. On September 12, 1866 the first producing oil well was drilled in Oil Springs, Texas. This was only the start of a long and productive life of the oil and gas industry, which is marked by such monumental discoveries including the "Black Giant" and the important traps that are formed by salt domes that produce structural highs trapping hydrocarbons with their attendant potential for high production. Although Texas has been extensively conventionally drilled, new developments in drilling techniques and a greater understanding of the Texas subsurface has enabled the discovery of previously unknown fields, as well as hydrocarbon production from what were thought to be unreachable and uneconomic wells. The next frontier for Texas oil is likely to be found in the deeper reaches of the offshore Gulf of Mexico. The development of this relatively untapped resource will enable the fruitful history of the Texas oil and gas industry to continue.

Board 24

Jerod Parr, Senior, Geology
Faculty Mentor: Dr. Steven G. Driese

Title: *Lake Waco Water Quality: The effects of abundant algal growth on water quality*
(Department of Geology)

This project addresses studies designed to better understand why Waco's water quality is so poor, as well as to summarize what attempts have been proposed to improve water quality. Lake Waco has four sources of water flow which feed into the lake and supply it with water. The North Bosque River, located on the northern end of the lake,

contributes the largest amount of water to the lake over any other water source. The North Bosque Watershed, located in Erath County, is home to a large majority of Texas dairy farming. The waste associated with dairy cows within the watershed has been postulated to be a cause for the pollution that has been sent down river, thus causing high amounts of nutrients to reach Lake Waco, especially phosphorus. This study focuses on how the nutrients of the North Bosque Watershed are being released by dairies into the soil and watershed, and then carried down the North Bosque River into Lake Waco; it also addresses how these nutrients are currently causing large populations of algae to develop in Lake Waco. The blue-green have made effective water treatment very difficult for the City of Waco, and the process to kill the algae in the early stage of treatment still allows for a distinct (and unpleasant) odor and taste to develop in the water. The City of Waco has worked with many scenarios on how to treat and improve the algal growth, as explained in depth in this study.

Board 25

Jordan Dubuisson, Senior, Geology

Faculty Mentor: Dr. Steven G. Driese

Title: *Universal Graveyards: The Past and Future*
(Department of Geology)

Lagerstätten, meaning place of storage, is a sedimentary deposit that exhibits extraordinarily rare fossil deposits that preserve the remains of soft tissues or skeletal elements of organisms. These "universal graveyards" are distinguished by paleontologists into two distinct categories; Konzentrat (concentration) Lagerstätten - the containment of an abundance of fossils, and Konservat (conservation) Lagerstätten – the containment of exceptionally preserved fossils. There have been hundreds of marine and terrestrial Lagerstätten found across the world, with possibly countless more yet uncovered. Focusing on twelve major Lagerstätten, research was completed to analyze their significance, geographic location, species found, and methods of preservation, including sabertooth cats buried in ancient tar pits of Southern California, and the feathered remains of Archaeopteryx, found in Upper Jurassic Limestone in Germany. Among the dozen Lagerstätten analyzed, two in particular stand out among paleontologists: the Burgess Shale of Canada and the Chengjiang deposits of China. These exceptionally preserved remains represent over 140 fossil species, 98% being marine. The significance of these Lagerstätten is their links between one another and their removal of certain biases in the fossil record. The Burgess Shale was interpreted to have been preserved by a massive landslide, whereas the Chengjiang by a rapid succession of turbidity currents. These exceptional preservation events inhibited the processes of destruction and decay, depriving the remains of oxygen. The future holds much in store for study of these precious reserves, and with the availability of sophisticated analyses tools in the past few decades, a new advanced search for undiscovered Lagerstätten has risen.

Board 26

Jacob R. Murray, Freshman, Entrepreneurship and International Business

Faculty Mentor: Director Janet Norden

Title: *The Color of Opportunity - The Correlation Between Race and Success*
(Global Community Living-Learning Center)

This research should serve to educate those of the Greater Waco Area regarding the problem of insufficient opportunity distribution among blacks and Hispanics within the community. With Waco's poverty level currently resting at 27.6%, and the number of impoverished blacks and Hispanics more than double that of whites, we are forced to take a second look at the correlation between race and opportunity in our area. Using raw data taken from two government housing projects (Kate Ross & South Terrace) this research should yield ample results indicative of a distinct trend of ineffective opportunity distribution among the disadvantaged of Waco, Texas.

Board 27

Megan Boyd, Sophomore, Biochemistry

Faculty Mentor: Director Janet Norden

Title: *Access to Health Care in Diverse Waco Communities*
(Global Community Living-Learning Center)

I am researching the availability and quality of health care among different groups in Waco. I plan to use surveys to determine if factors such as race, educational background, or English proficiency has an affect on the quality of ones health care in Waco. My hypothesis is that minorities are not sharing equal quality with whites because of these factors, and I want to bring awareness into Waco if I am correct.

Board 28

Myles Daniel Baker, Sophomore, Mathematics

Faculty Mentor: Dr. Qin Sheng

Title: *On consistency, accuracy and error estimates of finite difference approximations of the Black-Scholes equation on nonuniform grids*

(Department of Mathematics)

In my presentation I will explore several finite difference approximations of the Black-Scholes partial differential equation used in economics and finance. Nonuniform difference grids will be employed for constructing adaptive discretization platforms, which are necessary for effective solution computations. My investigations will start from the consistency of various difference formulas for approximating the second order derivative. I will then extend the results to two dimensional cases. Based on my explorations, I will be able to construct consistent explicit, implicit and leapfrog finite difference schemes on nonuniform grids. Their orders of accuracy and truncation errors will be derived and analyzed. I will present new higher order schemes for demanding applications. Computational examples will be given to illustrate my discoveries. Expectations on continuing research issues will also be discussed.

Note: Part of this research is accomplished jointly with Mr. Andrew Sheng from the Westwood High School, an incoming freshman at Baylor.

Board 29

Meaghan McNeill, Junior, Mathematics and Biology

Faculty Mentor: Dr. Lance Littlejohn

Title: *Radius of Transition Curvature: Determining Collagen Alignment in Porcine Heart Valves*

(Department of Mathematics)

In uniaxial tensile testing of heart valves, it has been qualitatively observed that stress-strain curves of some valves have a more acute transition region from low to high stresses. The novel parameter radius of transition curvature (RTC) was developed to quantify the acuteness of this transition region. The method rotates the stress-strain curve so that a point marking the transition region becomes minimum. A hyperbolic curve is fitted to this data, and RTC is defined as the reciprocal of the second derivative at the hyperbola's vertex. RTC was applied to assess stress-strain curves of porcine aortic and mitral valves in circumferential and radial directions across a variety of ages. Differences between valves and age groups are hypothesized to represent differences in collagen alignment and homogeneity of collagen crimp. A smaller RTC implies that load is more quickly transitioned from elastin fibers to the load-bearing collagen fibers, which is more efficiently accomplished if collagen fibers are aligned with the load and are uniformly crimped. Results showed that circumferential sections had a smaller RTC than radial sections. Among the circumferential sections, the RTC of aortic valves was smaller than that of mitral valve anterior centers and that of mitral valve free edges. In the mitral valve, RTC increased with age. These results suggest that collagen fibers are more aligned and uniformly crimped circumferentially, in the aortic valve and mitral valve anterior center, and in younger valves. This novel parameter RTC may be applied to evaluating tissue engineered heart valves and in researching other connective tissues that display similar stress-strain curves.

Board 30

Lindsay Buckingham, Junior, Physics

Faculty Mentor: Dr. Jeffrey S. Olafsen

Title: *Column Strain Analysis via Image Tracking*

(Department of Physics)

We report the results of an image algorithm to track strain in a reinforced concrete column. The program processes a large number of individual images and uses them to construct a representation of the motion of the column as a function of time. The displacement of the column and its strain are then extracted from the motion of the column. This remote sensing technique for the dynamics does not involve a sensor that is physically connected to the column. Such sensors can be affected by the very damage to the column that is being recorded. Remote sensing of such structures provides a cheaper and more reliable method of simultaneously monitoring a large number of bridges, buildings and similar man-made structures.

Board 31

Jacob Jantzi, Junior, Physics

Faculty Mentor: Dr. Jeffrey S. Olafsen

Title: *Three-Dimensional Particle Tracking Utilizing Magnetic Resonance Imaging*

(Department of Physics)

MRI (Magnetic Resonance Imaging) utilizes a strong magnetic field that can align and detect water molecules inside objects of interest, which results in a corresponding resonance from the molecules that can be used to produce an

image of the object's internal structure. Particles visible to an MRI that are suspended in an optically opaque material can be viewed in all three spatial dimensions with this technique. In this experiment, mustard seeds were suspended in a porous medium of small glass beads. Mustard seeds were used due to their high water content, which allows them to be seen very clearly against the glass beads in an MRI image. The particles are sheared by rotating one of the boundaries and are tracked within the optically opaque medium by taking MRI images sequentially. The centers of the seeds can be distinguished within a single particle diameter separation, due to the high contrast between the seeds (high signal) and the glass beads (low signal). This is part of an effort to better understand the motion of particles in 3D induced by shear motion of the surrounding medium, as seen in the so-called "Brazil nut effect."

Board 32

Kristin Combs, Senior, Physics

Faculty Mentor: Dr. Jeffrey S. Olafsen

Title: *A Simple Numerical Simulation for a Single Granular Particle in a Viscous Bath*
(Department of Physics)

Recent measurements of the dynamics of a single granular tracer particle free to move on top of a fluctuating dimer lattice indicate that the dynamics are robust: The bottom and top layers each demonstrate strongly non-Gaussian and nearly Gaussian velocity distributions, respectively, over a significant range of shaking parameters. To investigate this behavior further, a simple computational simulation models a tracer particle in a random bath of fluctuating impulse kicks that are Gaussian or non-Gaussian and used to determine momentum exchange in the collisions between the tracer particle and the bath. A viscous drag force that acts on the tracer particle between collisions is introduced to examine its effect on the system. When a Gaussian bath is used, the tracer exhibits Gaussian statistics independent of the strength of the drag force. However, when a non-Gaussian bath is used, the tracer exhibits velocity statistics that become increasingly more non-Gaussian, approaching the flatness value of the bath, as the dissipation is increased.

Board 33

Kurt Schwartz, Senior, Physics

Faculty Mentor: Dr. Jeffrey S. Olafsen

Title: *The Dynamics of Polymer Folding in 2-Dimensions*
(Department of Physics)

Homogenous chains are oscillated on a pan partially filled with a viscous medium in order to study the physical dynamics of a collapsing homogeneous polymer. The purpose is to quantify these dynamics to see if this model system visually resembles the folding process of a "true" polymer. This experiment uses a range of model chain lengths to probe how the physical dynamics are dependent on the polymer size. Also, the motion of the center of mass is compared to a random walk. In this experiment, the folding process begins by oscillating a chain on a plate and taking pictures at a specified interval of time to analyze the motion of the chain as it folds. This folding, or collapse, is due to the minimization of the surface tension on each model monomer during the experiment. Using a computer program to analyze the pictures gives quantitative data which is used to characterize the physical dynamics. The goal is to use these observations to demonstrate that this model system physically mimics polymer folding.

Board 34

Ian Reeves, Sophomore, Physics

Faculty Mentor: Dr. Linda J. Olafsen

Title: *Laser Beam Profiling In the Infrared*
(Department of Physics)

The use of thermal imaging can be an effective and powerful tool for analyzing laser beam profiles to assess their quality in terms of both spatial and temporal scales. Through the use of a thermal camera with sensitivity in the range of two to fourteen microns in wavelength, optically pumped semiconductor laser structures can be assessed in terms of both the pump (driving) and emission (output) beams. The IDL programming language offers a straightforward platform with which to perform analyses on images from the thermal camera. Algorithms have been developed that allow a composite image of the laser pump and emission beams to be constructed from sequential images at relative phases within the laser cycle. This analysis allows not only for the evaluation of the average beam quality, but also the spatial and temporal variations within the duty cycle of the beams. From the relatively random processes of individual electrons in the semiconductor laser device being stimulated by the pump beam and emitting light, one expects the emitted beam to have a Gaussian shape. This assumption can be tested in both spatial and temporal scales to give additional descriptions of the quality of the semiconductor laser and provide important feedback to process by which the devices were constructed.

Board 35

Eileen Fernandez, Senior, Physics
Faculty Mentor: Dr. Lorin Matthews

Title: *Circumplanetary Dust: The Martian System and Saturn's F Ring*
(Department of Physics)

Circumplanetary dust (particle like material in planetary environments) is of interest due to the interactions between the grains and their plasma environment. When analyzed, the interactions serve as probes to the qualities of the plasma. Saturn's F ring presents a complex system to analyze, as it is dynamic and changes on a timescale of weeks. Many models of Saturn's F ring only include gravitational forces, as the charge on the micron-sized dust is expected to be small. However, some studies have shown that charges as small as one electron can have a macroscopic effect. This study presents a model for circumplanetary dust using a fifth order Runge-Kutta method in a Matrix Laboratory (MATLAB) program. It is built from a Formula Translating System (FORTRAN) program used to study circumplanetary Martian dust and includes effects due to the magnetic field, Poynting-Robertson drag, solar radiation force, gravitational forces due to the sun, the planet, and satellites, and the spherical harmonic contribution of the planet's gravity. This study begins with an analysis of grains in the Martian system. The program is then generalized to the Saturnian system and used to examine Saturn's E ring; results are compared with published results in order to test the accuracy of the program in the generalization to Saturn's system. Finally the program is used to study the odd behavior of Saturn's F ring, where we expect an accurate model of the grains' behavior.

Board 36

Jonathan Perry, Senior, Physics
Faculty Mentor: Dr. Lorin Matthews

Title: *Dipole-dipole interactions of charged magnetic grains*
(Department of Physics)

The interaction between dust grains is an important process in fields as diverse as planetesimal formation or the plasma processing of silicon wafers into computer chips. This interaction depends in part on the material properties of the grains, for example whether the grains are conducting, non-conducting, ferrous or non-ferrous. This work considers the effects that electrostatic and magnetic forces, alone or in combination, have on the coagulation of dust in a protoplanetary disk. A numerical model is used to simulate the coagulation of charged and uncharged dust aggregates formed from ferrous material. The interactions between extended dust aggregates are examined, specifically looking at how the arrangement of charge over the aggregate surface or the inclusion of magnetic material produces dipole-dipole interactions. It will be shown that these dipole-dipole interactions can affect the orientation and structural formation of aggregates as they collide and stick. Analysis of the resulting dust populations will also demonstrate the impact that grain composition can have on the structure of the aggregate as characterized by the fractal dimension, which varies depending on charge or magnetization of the initial population. An improved understanding of the dynamics of aggregating dust grains and how these dynamics depend on grain materials will lead to greater knowledge of the early processes leading to planet formation.

Board 37

Gilberto Villela, Senior, Physics
Faculty Mentor: Dr. Wickramasinghe Ariyasinghe

Title: *Electron Scattering of Organic Gases by Low Energy Electron Collision*
(Department of Physics)

The electron scattering of fluorocarbons is obtained by the firing of a low-energy (20 - 100V) electron gun beam at the fluorocarbon gas. The interior of the chamber is kept at 10^{-7} Torr of pressure, with an electrostatic analyzer measuring change in current of the beam. A small chamber fills with the gas (C₄F₆, C₄F₈, and others, depending on the trial), and forms a penetrable barrier between electron source and analyzer. With the chamber filled, the magnitude of the beam (measured in Amperes of current by the Faraday cup) decays as it travels through it. With each trial, a different density of gas is used, in turn making the current of the beam decay at different rates. This setup is typically called a linear transmission analyzer. Each trial shows that there is a relationship between the structure of the gas (cross sectional area), and how much energy is colliding with the gas. This can be expressed as an exponentially decaying function. The raw data is run through a numerical method of line fitting using data points called Linear Least Square Regression, allowing the construction of a formula and its coefficients that approximate the data points as a continuous function. The resulting function should improve upon previous functions, which suffer from poor calculations involving correction factors. This data will not include correction factors, and is expected to improve accuracy when used in further experimentation in the fields of plasma processing and plasma physics.

Board 38

Johnny Hua, Senior, Physics

Faculty Mentor: Dr. Wickramasinghe Ariyasinghe

Title: *Auger Electron Spectroscopy with electrons as the projectiles into Methane and Tetrafluoromethane*
(Department of Physics)

Auger electron spectroscopy (AES) is an analytical technique used in metallurgy and the microelectronics industry. Since every molecule produces a different Auger yield, by determining the Auger spectrum of each molecule, we will be able to determine the composition of surfaces and solid objects. Previous Auger studies on methane (CH₄) and tetrafluoromethane (CF₄) used He⁺ and H⁺ as the projectiles. The results show roughly a thirty percent difference in carbon-KLL between methane and tetrafluoromethane. Carbon-KLL is the name used to describe the carbon from methane and tetrafluoromethane whereas KLL represents the orbitals in which the electrons are emitted from the atom. This effort in the Auger studies will change the projectile to an electron. In doing so, we will potentially be able to explain whether the difference between carbon-KLL of these two gases are due to their chemical state or errors in background subtraction.

Board 39

Meagan Walters, Senior, Psychology

Faculty Mentor: Dr. Gary Elkins

Title: *A Tale of Two Scales: Irrational Ideation as a Precursor to Depression*
(Department of Psychology and Neuroscience)

Since the development of Rational Emotive-Behavior Therapy (REBT), irrational beliefs have been a core component in understanding mood disorders. This thesis aims to investigate the presence of an association between a psychological measure of irrational beliefs and depression. Three hundred and one young adults were assessed for irrational thoughts based on the McDonald Irrational Value Scale (IVS) and for depression according to the Center for Epidemiologic Studies Depression Scale (CES-D). One visual analog that assessed relationship satisfaction was also included. In accordance with current cognitive behavior theories, the existence of a correlation was hypothesized. Per our findings, $r = .281$ representing that a small yet significant correlation was detected at $\alpha < .05$ level. Essentially, the interaction linking irrational thought patterns to depression must remain a research area of interest in order to provide the most efficient treatment to the sufferers of emotional disorders. Implications of these results are addressed along with projected courses for future research in this area.

Board 40

Jenna Chang, Senior, Psychology

Faculty Mentor: Dr. Keith Sanford

Title: *Using Perceived Partner's Emotion In Predicting Forgiveness in Romantic Relationships*
(Department of Psychology and Neuroscience)

A sample of 113 participants in dating relationships completed an online questionnaire to investigate the extent to which perceived negative emotion in one's romantic partner during conflict predicts forgiveness. Participants were asked to recall a specific conflict that occurred in their current relationship and completed scales measuring the extent they perceived 3 types of negative emotions in their partner at the time of the conflict: hard emotion (e.g. anger or aggravation) soft emotion (e.g. hurt or sadness) and flat emotion (e.g. boredom or indifference), as well as four outcomes pertaining to forgiveness: negative attributions, desire for revenge, avoidance of the partner, and positive/negative valence of attitudes toward the partner. Results indicated that perceived hard, soft, and flat emotion were significantly related to components of forgiveness, yet, the most striking finding involved flat emotion. Perceived flat emotion produced robust and consistent correlations across all four components of forgiveness independent from relationship satisfaction. These findings support the general conclusion that perceptions in a romantic partner's emotion during conflict relate to forgiveness and specifically suggest that perceiving flat emotion in one's partner is the strongest predictor of non-forgiveness.

Bill Daniel Student Center
Baines
April 29, 2009 * 1:00 - 2:00 p.m.

Sarah Adcock, Senior, Anthropology

Matt Hanks, Senior, Anthropology

Faculty Mentor: Professor Carol Macaulay

Title: *Exposing Refuse Creation and Disposal Activities at a Late-Prehistoric Campsite on the Leon River using ArcGIS Spatial Analyst*

(Department of Anthropology, Forensic Sciences & Archaeology)

During the 2008 Baylor Archaeological Field School at the Upper Sprague site in Hamilton County (41HM54), a distinct semi-circular zone relatively void of cultural debris was exposed surrounding a hearth. We propose that this zone was intensively used for food preparation and tool maintenance and that it was periodically cleaned of the resulting refuse, with the exception of small amounts of residual primary refuse found within the zone and directly behind it on its western periphery. A large secondary refuse midden representing multiple dumping episodes is located between 1.5 and 3 meters to the northeast of the hearth complex. Using ArcGIS Spatial Analyst tools, we have identified distinct clusters of crushed bone, lithic debitage, mussel shell, fire-cracked rock, and expended tools which may represent distinct dumping episodes for maintaining a clean, multi-functional work space around the hearth.

Lyndsay DiPietro, Senior, Anthropology

Faculty Mentor: Professor Carol Macaulay

Title: *The Case of the Lone Bison Scapula and Rib Bone, Area D, Upper Sprague Site, Hamilton County*

(Department of Anthropology, Forensic Sciences & Archaeology)

During the 2008 Baylor University Archaeological Field School at the Upper Sprague site (41HM54) in Hamilton County, a lone bison scapula along with a bison rib bone which was placed under a large limestone rock were found approximately 1.5 and 2.0 meters, respectively, from a hearth in an area virtually void of cultural materials. This presentation will provide a number of interpretations of the placement of these two bones, including Binford's (1979) work regarding the caching and curating of artifacts among the Nunamiut Indians of Alaska and Schiffer's (1987) examination of a number of variables which contribute to de facto refuse deposition during site abandonment.

Bill Daniel Student Center
Baines
April 29, 2009 * 2:00 - 3:00 p.m.

Kaitlin Fogelsong, Junior, University Scholars

Faculty Mentor: Dr. Cristian Bratu

Title: *A la recherche du soi: The Role of Forgiveness in François Mauriac's novel Thérèse Desqueyroux*
(Department of Modern Foreign Languages)

In his novel *Thérèse Desqueyroux* (1927), François Mauriac illuminates the essential role that forgiveness plays in the process of redemption. The French courts tried the protagonist, Thérèse, for the attempted murder of her husband, Bernard, and issued the verdict of "non-lieu." This is an ambiguous decision which – for lack of conclusive evidence – abstains from proclaiming either the defendant's guilt or innocence. Thérèse's husband and local community refuse to forgive her or to allow her to attend church. Thérèse thus finds herself isolated from all forms of forgiveness, except for that of the divine. However, Thérèse falls into hypocrisy when she fails to live in compliance with her belief that one must not hide from one's true self and that one must always present that unadulterated self to others. The task of confronting her own sin is so daunting that she opts to present false facades to herself and the world. Due to the constant practice of self-masking, Thérèse eventually loses the ability to distinguish between the true and false presentations of herself. Mauriac thus demonstrates how one's true identity is lost without redemption in Thérèse Desqueyroux.

Rachel Beil, Senior, French and Religion

Faculty Mentor: Dr. Richard Duran

Title: *Vol de Nuit: la responsabilité contre le bonheur de l'individu*
(Department of Modern Foreign Languages)

Dans son roman, *Vol de Nuit*, Antoine de Saint-Exupéry utilise le personnage Rivière pour expliquer sa philosophie. On va discuter les pensées et les actions de Rivière pour voir Saint-Exupéry pensait la responsabilité de la société était plus importante que le bonheur de l'individu.

Aaron Reynolds, Senior, French and Religion

Faculty Mentor: Dr. Sinda Vanderpool

Title: *Les Thèmes Religieux Dans la Poésie de Victor Hugo*
(Department of Modern Foreign Languages)

Cette dissertation discute la place de la religion dans la poésie de Victor Hugo, et l'évolution personnelle du poète qui se révèle à travers ses œuvres. Alors que sa poésie de début relevait du style romantique, les événements tragiques et turbulents de sa vie ont fourni une base pour la poésie de la deuxième moitié de sa vie, qui reflète la quête d'un Dieu plus profond. Nous analyserons quelques poèmes de ses "Odes et Ballades", "Les Feuilles d'automne", "Les Châtiments", et "Les Contemplations", car les deux premiers recueils représentent sa pensée d'avant l'exil et la mort de sa fille, alors que les deux derniers, écrits pendant l'exil, témoignent d'une pensée plus troublée.

Bill Daniel Student Center
Baines
April 29, 2009 * 3:00 - 4:00 p.m.

Holly Murphy, Junior, University Scholars
Faculty Mentor: Dr. Alden Smith

Title: *Caelata fagina pocula: Irony in Virgil's Pastoral Ekphrasis*
(Department of Classics)

Scholars suggest that Virgil purposefully exposes the limits of pastoral poetry in his third Eclogue, a poem that ironically satiated the pastoral tradition (Segal "Virgil's Caelatum Opus: An Interpretation of the Third Eclogue" [1967]284-290). Virgil may employ ekphrasis in Eclogue 3 for that very purpose; while he uses language that invites comparison to Homer, his cups prove inferior both in material and in craftsman. Through his subtle use of irony, Virgil may be revealing an intention to move beyond bucolic poetry and look for a poetic masterpiece more suited to Homeric vocabulary.

Mary Claire Russell, Senior, University Scholars
Faculty Mentor: Dr. Alden Smith

Title: *Reading Augustine reading Virgil: 'Tolle Lege' Redux*
(Department of Classics)

Scholars have long explored Augustine's literary relationship to Virgil (Bennett, REAug [1988] 47-69; Ramage, PCP [1970] 54-60; MacCormack. *Shadows of Poetry: Virgil in the Mind of Augustine* CUP [1999]). Augustine uses Virgilian ideals and themes to demonstrate the way in which Christian ideology transcends Virgil's pagan framework (Mommsen, JHI [1951] 346-52; Gavigan, CW [1951] 50-53). The Christian journey ends in pax eterna which transcends the pax Romana. The Confessions is infused with Virgilian themes which are seen in the similar passages between the Confessions and the Aeneid. In Book 8 of Confessions, Augustine's conversion happens when he responds to the command tolle lege and then picks up the Bible and reads it. In Book 8 of the Aeneid, Aeneas takes his destiny upon his shoulders after picking up and "reading" the shield.

Katy Chenoweth, Senior, Classics
Faculty Mentor: Dr. Brent Froberg and Dr. Ben Arbuckle

Title: *A Study on the Gladiatorial Games*
(Department of Classics)

Gladiatorial games have not only been a source of interest for scholars, but also of controversy. Were the games spectacles of theatrical entertainment or bloody clashes between slaves and criminals? New archaeological data found at the site of ancient Ephesus provides insight into the gladiatorial games. While searching for the Holy Procession Path in Turkey, archaeologists stumbled upon a 2000 year old gladiator cemetery, containing sixty-eight individuals with signs of postmortem defects and ante mortem and postmortem wounds.

Forensic anthropology and pathology studies on the remains were carried out by Professors Fabian Kanz and Karl Grossschmidt from the University of Vienna. Elementary micro-analysis proves useful in determining the makeup of a gladiator's diet, and results show that a gladiator consumed high quantities of carbohydrates. The Austrian scientists relied on microscopes and CT scans to analyze when and how injuries were inflicted on the individuals. This paper focuses on the presentation of the forensic evidence from the ancient burial site and argues against the widely-held notion of savage gladiatorial competitions.

Bill Daniel Student Center
Baines
April 29, 2009 * 4:00 - 5:00 p.m.

Joel Trousdale, Sophomore, Language and Linguistics
Shauna Harris, Sophomore, Journalism
Megan Boyd, Sophomore, Biochemistry
Faculty Mentor: Dr. Randy Wood

Title: The Role of Bilingual Education in American Society
(Department of Educational Administration)

American educators have been debating the issue of bilingual versus monolingual education for years. Teaching in more than one language or allowing code-switching in the classroom are issues that continue to this day. Our research has focused on issues like Spanglish, bilingual education, and English-only classrooms, and we have come to the conclusion that bilingual education could be, overall, a positive tool for education in America.

Caleb Henrichsen, Sophomore, Medical and Humanities
Parker Stalls, Sophomore, Psychology
Faculty Mentor: Dr. Randy Wood

Title: *Immigrant Impact on American Health Care*
(Department of Educational Administration)

The flexibility of federal health care has been a long time debated issue, saturated with important values becoming especially vital concerning the growing immigrant population in the United States. The impact of medical treatments created and expended on immigrant populations within the American economy is vast and this study proves that the differences constitute a thick margin. There are many problems associated with this including: linguistic barriers taking part in patient and doctor relations, difficulties of Medicaid including and extending care to immigrant residents, and other difficult situations in which U.S. citizens are found at a disadvantage to receive their own coverage due to lack of general resources. These all contribute to a dilemma far too great at this point to not address and combat with a progressive system of counter programs. Data gathered from a number of reputable journals and previous studies connected to the same issues at hand are combined with personal experiences and interactions within the Hispanic community in order to provide plausible suggestions and solutions to these problems.

Jenna Satrang, Sophomore, Nursing
Faculty Mentor: Dr. Randy Wood

Title: *Hispanic Men: Fathers and Their Influences*
(Department of Educational Administration)

Fathers are an important aspect of family, especially in the Hispanic culture. Hispanic fathers leads their lives based on the ideals of the Hispanic culture, while also improving upon some of the negative stereotypes on the culture. The early life of a Hispanic man makes an impact on how the man will raise his children. Generally, Hispanic men are not the machismo men that American culture makes them out to be; they are men attempting to improve the future of their children. This presentation will show how Hispanic fathers can make a difference in the lives of their children, and how many stereotypes of Hispanic fathers are false.

Megan Keyser, Sophomore, Journalism
Felix Saenz, Sophomore, University Scholars
Luis Maldonado, Junior, Pre-Business
Faculty Mentor: Dr. Randy Wood

Title: *Immigration and the Economy*
(Department of Educational Administration)

Our presentation will use statistics, images, and video to show the effects immigration has on the U.S. economy and vise versa, focusing primarily on workplace environments and health care. We will use information and statistics gathered through extensive research during the Fall 2008 semester in the Hispanic Families in Transition ELG and condense it, highlight major points, and apply it to a Powerpoint presentation using visual aids such as graphs, photos, and/or video clips.

Baylor Sciences Building
E.125
April 29, 2009 * 4:00 - 5:00 p.m.

Eileen Fernandez, Senior, Physics

Faculty Mentor: Dr. Lorin Matthews

Title: *Circumplanetary Dust: The Martian System and Saturn's F Ring*
(Department of Physics)

Circumplanetary dust (particle like material in planetary environments) is of interest due to the interactions between the grains and their plasma environment. When analyzed, the interactions serve as probes to the qualities of the plasma. Saturn's F ring presents a complex system to analyze, as it is dynamic and changes on a timescale of weeks. Many models of Saturn's F ring only include gravitational forces, as the charge on the micron-sized dust is expected to be small. However, some studies have shown that charges as small as one electron can have a macroscopic effect. This study presents a model for circumplanetary dust using a fifth order Runge-Kutta method in a Matrix Laboratory (MATLAB) program. It is built from a Formula Translating System (FORTRAN) program used to study circumplanetary Martian dust and includes effects due to the magnetic field, Poynting-Robertson drag, solar radiation force, gravitational forces due to the sun, the planet, and satellites, and the spherical harmonic contribution of the planet's gravity. This study begins with an analysis of grains in the Martian system. The program is then generalized to the Saturnian system and used to examine Saturn's E ring; results are compared with published results in order to test the accuracy of the program in the generalization to Saturn's system. Finally the program is used to study the odd behavior of Saturn's F ring, where we expect an accurate model of the grains' behavior.

Johnny Hua, Senior, Physics

Faculty Mentor: Dr. Wickramasinghe Ariyasinghe

Title: *Auger Electron Spectroscopy with electrons as the projectiles into Methane and Tetrafluoromethane*
(Department of Physics)

Auger electron spectroscopy (AES) is an analytical technique used in metallurgy and the microelectronics industry. Since every molecule produces a different Auger yield, by determining the Auger spectrum of each molecule, we will be able to determine the composition of surfaces and solid objects. Previous Auger studies on methane (CH₄) and tetrafluoromethane (CF₄) used He⁺ and H⁺ as the projectiles. The results show roughly a thirty percent difference in carbon-KLL between methane and tetrafluoromethane. Carbon-KLL is the name used to describe the carbon from methane and tetrafluoromethane whereas KLL represents the orbitals in which the electrons are emitted from the atom. This effort in the Auger studies will change the projectile to an electron. In doing so, we will potentially be able to explain whether the difference between carbon-KLL of these two gases are due to their chemical state or errors in background subtraction.

Baylor Sciences Building
E.125
May 1, 2009 * 3:30 - 4:30 p.m.

Kurt Schwartz, Senior, Physics

Faculty Mentor: Dr. Jeffrey S. Olafsen

Title: *The Dynamics of Polymer Folding in 2-Dimensions*
(Department of Physics)

Homogenous chains are oscillated on a pan partially filled with a viscous medium in order to study the physical dynamics of a collapsing homogeneous polymer. The purpose is to quantify these dynamics to see if this model system visually resembles the folding process of a "true" polymer. This experiment uses a range of model chain lengths to probe how the physical dynamics are dependent on the polymer size. Also, the motion of the center of mass is compared to a random walk. In this experiment, the folding process begins by oscillating a chain on a plate and taking pictures at a specified interval of time to analyze the motion of the chain as it folds. This folding, or collapse, is due to the minimization of the surface tension on each model monomer during the experiment. Using a computer program to analyze the pictures gives quantitative data which is used to characterize the physical dynamics. The goal is to use these observations to demonstrate that this model system physically mimics polymer folding.

Gilberto Villela, Senior, Physics

Faculty Mentor: Dr. Wickramasinghe Ariyasinghe

Title: *Electron Scattering of Organic Gases by Low Energy Electron Collision*
(Department of Physics)

The electron scattering of fluorocarbons is obtained by the firing of a low-energy (20 - 100V) electron gun beam at the fluorocarbon gas. The interior of the chamber is kept at 10^{-7} Torr of pressure, with an electrostatic analyzer measuring change in current of the beam. A small chamber fills with the gas (C₄F₆, C₄F₈, and others, depending on the trial), and forms a penetrable barrier between electron source and analyzer. With the chamber filled, the magnitude of the beam (measured in Amperes of current by the Faraday cup) decays as it travels through it. With each trial, a different density of gas is used, in turn making the current of the beam decay at different rates. This setup is typically called a linear transmission analyzer. Each trial shows that there is a relationship between the structure of the gas (cross sectional area), and how much energy is colliding with the gas. This can be expressed as an exponentially decaying function. The raw data is run through a numerical method of line fitting using data points called Linear Least Square Regression, allowing the construction of a formula and its coefficients that approximate the data points as a continuous function. The resulting function should improve upon previous functions, which suffer from poor calculations involving correction factors. This data will not include correction factors, and is expected to improve accuracy when used in further experimentation in the fields of plasma processing and plasma physics.

2009 Black Glasses Schedule
Castellaw 101
May 1, 2009 * 7:00 p.m.

Jordan Bellamy, Junior, Great Texts of the Western Tradition

Title: *The Payback* (12:08)
(Department of Communication Studies)

Hogan Allcorn, Senior, Film and Digital Media

Title: *Boy Feets Girl* (7:05)
(Department of Communication Studies)

Tyler Ellis, Senior, Film and Digital Media

Title: *Something Tastes Fishy* (4:01)
(Department of Communication Studies)

Shane Bierley, Senior, Film and Digital Media

Title: *Do Not Disturb* (22:33)
(Department of Communication Studies)

B. K. Garceau, Senior, Film and Digital Media

Title: *Clairmont "Dear to the One" music video* (4:54)
(Department of Communication Studies)

Andrew Gerhards, Senior, Film and Digital Media

Title: *Desolation* (29:00)
(Department of Communication Studies)

Will Bakke, Junior, Telecommunications

Title: *One Nation Under God trailer* (1:30)
(Department of Communication Studies)

Phillip Heinrich, Freshman, University Scholar

Title: *Unrenewable* (10:27)
(Department of Communication Studies)

Jordan Bellamy, Junior, Great Texts of the Western Tradition

Title: *David Crowder – Band Rockumentary* (6:57)
(Department of Communication Studies)

Shane Bierley, Senior, Film and Digital Media

Title: *House of Orange "Art of the Animal" music video* (4:54)
(Department of Communication Studies)

A. J. Detisch, Junior, Film and Digital Media

Title: *Left of Dial* (8:03)
(Department of Communication Studies)

David Roark, Senior, Telecommunications

Title: *Hipsters* (24:16)
(Department of Communication Studies)

Special thanks to the URSA Scholars Week Committee:

Dr. Jeff Tanner, Co-Chair

Dr. Frieda Blackwell, Co-Chair

Dr. Sara Alexander

Dr. Greg Benesh

Dr. Rena Bonem

Dr. Jann Cosart

Dr. Mark Dunn

Dr. Brian Garner

Ms. Margaret Thomson

Dr. Kathy Whipple

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