

The Honors School Fall Research Conference 2008

Fourth Honors School Research Conference

**Wilson Auditorium
Wednesday, December 10th, 1:00 p.m.— 4 :00 p.m.**

It is with great pleasure that The Honors School presents its
Fourth Honors Research Conference

Student presenters include research in the fields of:

Anthropology

English

Business Accounting

Math

Business Finance

Order of Events

1:00 p.m. Welcoming Remarks

Andrew Katz (BUBA)

Tara Parente (BUBF)

Chris D'Antuono (BUBA)

Erin Humphries (MA)

Joseph York (MA/EDS)

Leanne Clarke (MA)

Keri Sansevere (AN)

Brittany Scott (EN)

Additional student completing Thesis but unable to attend:

Sunaina Kaushal (BY)

** Please see last page of program for Thesis title, Chief Advisor, and Second Reader.

**PRESENTERS****Andrew Katz****Natural Monopolies: A Study of One of Our Nation's Most Undervalued Niche Markets****Chief Advisor: Prof. Douglas Stives****Second Reader: Prof. Daniel He**

This thesis will look at perhaps the most underrated section of the U.S. economy, in terms of profitability. In many other countries, the term 'natural monopoly' has little value to it due to lax laws concerning formations of entities such as cartels, trusts, and monopolies. However, in the U.S.A. the aforementioned entities are illegal under most circumstances making it of the utmost importance to find legal ways to dominate an industry. As it turns out, this method is the formation of 'natural monopolies.' These 'natural monopolies' exist so successfully for a number of reasons that center around the establishment of one's business in an industry where it is extremely difficult for competitors to generate sizeable profits in a completely legal manner.

Tara Parente**Credit Derivatives: An analysis of the viable factors responsible for the capricious conditions in the credit derivative markets.****Chief Advisor: Dr. Andreas Christofi****Second Reader: Prof. John D. Burke**

This research explores the factors contributing to the capricious conditions in the credit derivative markets. Throughout this research much has been revealed. Credit derivative use creates disarray due to discrepancies in valuation models, undisclosed business techniques, and firms assuming less risk. An accumulation of these factors ultimately creates a disturbing environment. Banks, financial firms, and many other companies are no longer assuming risks due to the use of credit default swaps and collateralized debt obligations. If these firms would assume some risk, they would actually hold interest in whether or not there is a high risk of default. They would also understand how firm risk default is highly correlated. Firms should ultimately be required to hold a specific amount of risk instead of hedging most of it. Requiring firms to hold a certain amount of risk will uphold prudent lending and financial policies. Moreover, the buying and selling of these instruments requires some major improvements regarding the valuation models, the undisclosed techniques, and assumptions of risk.

Christopher D'Antuono**Tax Policy's Effects on the Economy in Times of Recession****Chief Advisor: Prof. Douglas Stives****Second Reader: Dr. Steven Pressman**

The economy is currently spiraling downwards towards recession. Efforts are being made to stimulate the economy through many different methods. One important way the government can affect the economy is through tax policy. The subject of this project is how tax policy can affect the national economy in times of recession. This topic is important because in the near future we will all be hearing what the new presidential administration's plans are to curtail the recession. Certainly, tax policy will be a part of these plans. This project analyzes what tax policies may be effective and which will fail. It also concentrates on tax policy that has already been passed, namely, the economic stimulus package of last summer, and the new housing assistance tax act. Despite many recessions and even a great depression, our current problems are unlike any other in history. Our economic problems are stemming from a sub-prime mortgage crisis and a decline in housing prices. Tax policy is a widely understood topic but it has not been tested against the problems we now face. This project encompasses my discrete contribution to the field by explaining how the use and influence of tax policy will expand in the future and how this will affect our current economy.



PRESENTERS (cont.)

Erin M. Humphries
An Investigation into the Secret World of Steganography

Chief Advisor: Dr. Joseph Coyle
Second Reader: Dr. David Marshall

Imagine doing a Google Image search on the internet and having various hidden messages floating across the screen that are impossible to detect by the human eye. Which images contain a hidden message? How do you figure it out? The answer to these questions begins with understanding steganography. Steganography is often referred to as the concealing of digital information within computer images or files. The expansion of internet utilization has caused many investigators to develop methods to ensure security across computer systems. In my own investigation into the secret world of steganography I used a method called LSB (Least-Significant Bit) Embedding. A mathematical program named Matlab was used to generate a gray-scale image in which a message was concealed. After figuring out how to embed my own message I used Matlab to develop a program to test random pictures for potential secret messages. The results are appealing for one wanting to know more about the fast growing computer world.

Joseph A. York
Heronian Tetrahedra: A Mathematical Investigation of Heronian Triangles and Tetrahedra

Chief Advisor: Dr. David Marshall
Second Reader: Dr. Joseph Coyle

This project was designed to investigate a special class of geometric figures known as Heronian triangles, as well as their three dimensional counterpart, Heronian tetrahedra. A Heronian triangle is a triangle that has integral side lengths and integral area. These triangles have been studied by several mathematicians, leading to the discovery of several interesting properties exhibited by this unique class of triangles. My study considers some of the questions that have been asked concerning properties of Heronian triangles, and attempts to formulate analogous questions for the Heronian tetrahedra. Heronian tetrahedra, sometimes referred to as perfect pyramids, are tetrahedra with integer edge lengths, integer faces, and integer volumes. Using various geometric methods, as well as mathematical computer programs, such as Maple™, this project investigates the properties of these perfect pyramids.

Leanne Clarke
Covering Sets of Congruences

Chief Advisor: Dr. Susan Marshall
Second Reader: Dr. Bonnie Gold

A collection of congruences with distinct moduli, each greater than 1, such that each integer satisfies at least one of the congruences, is said to be a covering system. In 1950, a famous mathematician by the name of Paul Erdős conjectured that "for each number N , one can cover the integers with finitely many congruences with distinct moduli all greater than N ." Erdős' problem still remains open today and as of now, a mathematician by the name of Nielsen has taken the lead as he has created a covering system with the smallest modulus of 36. In my thesis, I have worked to create my own covering systems of congruences. In addition, I have created my own computer program in Maple to check if a set of given moduli do indeed cover all integers. Further, I was able to determine the upper and lower bounds on the number of moduli necessary to create a covering system with the smallest modulus equal to 2.

Keri J. Sansevere
The Most Ancient Village in Our Country: Interpreting Forgotten Colonial Material at the Salisbury Site

Chief Advisor: Dr. Richard Veit
Second Reader: Prof. Michael Gall

Excavated nearly seventy years ago by Dorothy Cross as part of the Works Progress Administration, the Salisbury Site has been called one of the oldest centers of Native American activity in the Delaware Valley. Since Cross' excavation, archaeologists have focused their scholarship on interpreting the thousands of prehistoric artifacts excavated from the site while providing little or no explanation of 17th-century historic material, including nearly 600 tobacco pipe fragments. This paper will explore the forgotten colonial artifacts from the Salisbury Site through the lens of 21st century archaeology by researching early colonial history and artifact analysis. With this data, an expanded interpretation of the site will be presented.



PRESENTERS (cont.)

Brittany Scott

Of Both Sexes: A Study of the Androgynous Symbolism, and its Empowerment of Women, in Virginia Woolf's Orlando

Chief Advisor: Dr. Sejal Sutaria

Second Reader: Dr. Brian Garvey

Virginia Woolf remains an active participant in the feminist movement surviving through the accomplishments of her literary career. Many of her novels feature feminine protagonists in conflict with internal and external forces in efforts towards self-discovery. Woolf theorizes that this is obstructed by gender bias as subjected to varying social constraints. In theory this is escapable through what Woolf deems as the androgynous state of mind, wherein heterogeneous beings coexist harmoniously within equality- a utopia of sorts. This is conveyed by means of androgynous symbolism, particularly evident within the novel Orlando. This allows Woolf to enter the realm of her readers' subconscious where she may unknowingly educate those who are perhaps unreceptive of androgyny within the ultra conservative and conventional society in which her works were published. The examination of this thesis unfolds with an intense study of multiple novels and short stories produced by Woolf herself, support gathered by acclaimed literary critics, interviews of Woolf's family and friends, and the portrayal of Woolf as she transgresses into 21st century society.

Additional Student Completing Thesis

*Sunaina Kaushal

Serotonin Receptor Expression in the Juvenile and Adult Rat Brain

Chief Advisor: Dr. Dennis Rhoads

Second Reader: Dr. Michael Palladino

Save the Date

Spring Honors Research Conference 2009

Saturday, April 25, 2009



where leaders look forwardSM