

# THE HONORS SCHOOL RESEARCH CONFERENCE

*It is with great pleasure that the Honors School  
presents its Spring 2016 Research Conference.*

*Student presenters include research in the fields of  
Accounting, Biology, Business, Communication, English,  
Finance, Health Studies,*

## **PRESENTERS**

Marc Carroll (BUBF)

Michael Fanizza (BUBA)

Marlena Glebocki (BY)

Genesis Gonzalez (PY)

Taylor Klodowski (SE)

Amanda Kontor (CO)

Jennifer Lee (HE)

Jordyn Magenheim (PY)

Mitchell Parker (BY)

Stephanie Puwalski (SO)

Carlie Till (EN)

**MONMOUTH  
UNIVERSITY**

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STUDENT SCHOLARSHIP WEEK

**SPRING 2016**  
**HONORS SCHOOL**  
**RESEARCH CONFERENCE SCHEDULE**  
**APRIL 22, 2016**  
**WILSON AUDITORIUM**

**SESSION A: 1:30 p.m. – 2:50 p.m.**

**Opening Remarks: Kevin Dooley**  
**Dean of the Honors School**

Jordyn Magenheim (PY)  
Amanda Kontor (CO)  
Taylor Klodowski (SE)  
Mitchell Parker (BY)  
Jennifer Lee (HE)  
Michael Fanizza (BUBA)

**SESSION B: 3:00 p.m. – 4:00 p.m.**

Marc Carroll (BUBF)  
Marlena Glebocki (BY)  
Genesis Gonzalez (PY)  
Stephanie Puwalski (SO)  
Carlie Till (EN)

**Closing Remarks: Kevin Dooley**

# *Welcoming Remarks*

**DR. KEVIN DOOLEY, *Dean of The Honors School***

*Presenters (in alphabetical order)*

**MARC CARROLL | *Evidence for IPO Pricing Biases in Stocks Based on Implied Growth Rates***

Chief Advisor: Dr. Andreas Christofi

Second Reader: Dr. Barrie Bailey

The purpose of this thesis is to shed some light on whether or not initial public offerings (IPOs) were fairly valued at their IPO debut, given the information available at the time of the offering. However, such a task may not be so evident given the limited information at the time of the IPO and the prospects of a newly created firm, especially with high growth potential. For this reason, in addition to IPO-valuation, this thesis uses current/post-IPO valuation metrics to determine a comparable valuation and to establish a link between the two valuations. In the case of a mispricing of an IPO, we sought to understand the cause of such a mispricing. This thesis uses a reverse engineering approach suggested by Christofi et. al. (1999). Rather than solving for the price, these authors used the price as given and solved for the Implied Growth Rate (IGR) in the cash flows to equity. For high-growth firms, like Facebook and Alibaba, the IGR should be fairly high at around 9%-9.5%. The benchmark IGR for typical large industrial firms is about 4%-5%. As an example, Alibaba was fairly priced at its IPO but is currently deemed as underpriced, given the information available in the market. On the other hand, Facebook was underpriced as an IPO company by underestimating its potential growth in its revenues and cash flows.

**MICHAEL FANIZZA | *Variables that Affect the Tax Burden of Individuals in States***

Chief Advisor: Prof. Doug Stives

Second Reader: Dr. Stephen Chapman

Taxation is one of the most complex practices in American life. Americans tend to forget that without this practice, American infrastructure will suffer and government spending will increase deficits. The goal of this research paper to educate the reader on the different factors that affect taxes and estimate the actual effect on an individual's tax burden using the regression analysis tool in Excel. First, the research will focus on explaining each factor by using conceptual knowledge and research in order to show its significance on a more qualitative level. Hopefully, by supporting these findings and statements with numbers, the reader will improve their understanding of tax policy. In the analysis, all fifty states and their respective data will be used to provide the most accurate model. By using more substantive data, the regression analysis will find results that best reflect the factors that affect individuals in states.

**MARLENA GLEBOCKI** | *The Role of Mangroves in the Distribution and Abundance of Benthic Invertebrates in the Bahamas*

Chief Advisor: Dr. Pedram Daneshgar  
Second Reader: Prof. John Tiedemann

The abundance, species diversity, and functional diversity of benthic macroinvertebrates were studied and compared in mangrove, tidal flat, and creek mouth habitats on the island of Eleuthera, The Bahamas. Benthic sediment sampling took place at four distinct tidal creek sites: Broad Creek, Deep Creek, Kemps Creek, and Wemyss Bight. Twelve sediment samples were taken randomly from each habitat type at each site for a total of 36 samples per site, and all invertebrates were counted. A total of 25 invertebrate species were identified during the study, and the Shannon-Wiener diversity index was used to calculate species diversity in each habitat type. Species were categorized into four functional groups: gastropod, bivalve, crustacean, and polychaete. There was a difference in invertebrate abundance between the three habitats across sites, and abundance was found to be higher in the mangrove habitat compared to the tidal flat and mouth habitats. There was no difference in species diversity between habitats across sites, but functional diversity was found to be lowest in the mangrove habitat. Mangrove swamps are currently declining due to anthropogenic threats related to pollution, industrial development, aquaculture, agriculture and urbanization. This study provides a necessary preliminary baseline for the abundance and diversity of benthic invertebrates in the Cape Eleuthera region of The Bahamas.

**GENESIS GONZALEZ** | *Patriarchy and Transgression in Federico García Lorca's Rural Trilogy: Bodas de sangre, Yerma, and La casa de Bernarda Alba*

Chief Advisor: Dr. Alison Maginn

This paper will examine Federico García Lorca's rural trilogy: *Bodas de sangre*, *Yerma*, and *La casa de Bernarda Alba* through feminist theory. The focus will be precisely on patriarchal structures in these female-driven plays as well as the transgressions that ultimately follow. García Lorca is well-known for the emphasis on female characters in his writing. An illustration of this is *La casa de Bernarda Alba*, a play comprised entirely of women characters, in which men are often mentioned but never set foot on stage. Interestingly, although no man ever sets foot on stage, the women in *La casa de Bernarda Alba* subscribe to and are oppressed by patriarchal structures. Furthermore, critics have argued that the women presented by García Lorca serve as a representation of himself – a gay man oppressed by the prescriptions and limitations of traditional Spanish society. In order to fully comprehend the women in García Lorca's writing, and in the process understand the author himself, it is imperative to analyze this rural trilogy from a feminist point of view.

## **TAYLOR KLODOWSKI** | *bridge.io*

Chief Advisor: Dr. Allen Milewski

Technology is expanding faster than scholastic institutions can match. This vast expansion has led to the birth of the online 'learn-to-code' movement. Using principles of Child Computer Interaction, contributors to this movement have built widely used software systems that are both engaging to children and beneficial to spreading computer science education awareness overall. These resources allow young students to learn a wide array of skills through tutorials and games. This thesis first completes a deep dive evaluation pitting the three most popular online resources, Codecademy, Code Avengers, and Scratch, against the widely accepted Bloom's Taxonomy learning structure. The results of the evaluation were clear: the child oriented tutorial resources, while focused on the bottom tiers of Bloom's Taxonomy are, in turn, neglecting the apex tiers of synthesis and evaluation. Without having the underlying synthesis and evaluation layers, young coders may find themselves unable to apply the knowledge to other areas with the appropriate confidence and accuracy. It is important to bridge the gap from introductory programming to adult programming, while keeping in mind that the learner in question is a young student. Bridge.io is an open-ended web based learning tool that aims to teach young students real world programming tools, practices, and skills. This proposed software solution focuses on the synthesis and evaluation tiers of Bloom's Taxonomy. Using a combination of introductory web development languages: HTML, CSS, and JavaScript, students are encouraged to formulate personal solutions to a spectrum of projects. Giving users a platform filled with puzzles where the pieces fit more than one way fosters creativity, imagination, problem solving skills, and above all provides students with a mastery of technical skills. The goal of bridge.io is to bridge the gap between game-like programming and real-world development, in hopes of furthering computer science education among the younger generation of students.

## **AMANDA KONTOR** | *Eye in the Sky: A Look at Shrewsbury's Christ Church through an Unmanned Aerial Vehicle*

Chief Advisor: Dr. Jennifer Shamrock

The phrases "unmanned aerial vehicle" and "drone" gradually surfaced in the public vernacular at the turn of the century. With reports of United States drone activity in the Middle East at one point saturating the news, it is not surprising that the mere mention of drones is likely to conjure up images of the military or scenes of destruction. However, adaptations to this technology have made it possible for unmanned aerial vehicles to claim uses beyond the military. These applications in a variety of fields do not only serve to bring communities together rather than shattering them, but also to erode the negative connotations attached to drones. This project highlights a nonmilitary use of drones in the context of Christ Church, an Episcopalian church in Shrewsbury, NJ, that is listed on both the United States and New Jersey Registers for Historic Places. Aerial footage of the celebrated site taken by an unmanned aerial vehicle and turned into a series of short films demonstrates how drone technology has secured the ability to showcase and preserve an important location in a way it has never been seen before, make that location accessible internationally, and even act as a modern public relations tool.

## **JENNIFER LEE** | *Development of a Biosensor: An RNA Aptamer*

Chief Advisor: Dr. Jonathan Ouellet

This study was undertaken to create a biosensor to detect the presence of certain cancer types. Cancers, such as Acute Myeloid Leukemia (AML) and Glioma, will potentially be able to be detected with new biosensors. These cancer produce 2-Hydroxyglutarate. This metabolite is produced by a single amino acid substitution in the enzyme Isocitrate Dehydrogenase (IDH). IDH is an enzyme within the citric acid cycle that produces  $\alpha$ -ketoglutarate ( $\alpha$ -KG) and carbon dioxide from oxaloacetate while reducing NAD(P)<sup>+</sup>. A DNA mutation causes the enzyme not to function correctly, disrupting the normal cycle and thus producing 2-HG1. The goal of this project is to detect those cancers by developing a 2-HG biosensor. More specifically, RNA aptamer will be created in order to detect the presence of 2-HG. An RNA aptamer is a selectively developed single stranded RNA sequence that is created through the process of SELEX (Systematic Evolution of Ligands by Exponential Enrichment). The new RNA aptamer would specifically and tightly bind to the 2-HG metabolite, only found in cancer cells. Selection of aptamers takes place by using a type of ribozyme, which is an RNA that act similarly to enzymes and has a self-cleavage activity. The aptamers, when combined with ribozymes, self-cleave due to the metabolite binding, thereby detecting the presence of 2-HG molecules. In order to develop the specific RNA aptamer, a technique called SELEX, also known as in vitro selection, is carried out. Current results show that aptamer detection of 2-HG is successful and the next final steps include purifying the sample multiple times to clean out any background. With a successful aptamer, a biosensor can then be developed.

**JORDYN MAGENHEIM** | *The Relationship Between Cell Phone Separation and Affected Cognitive Responses*

Chief Advisor: Dr. Jack Demarest

This study seeks to experimentally measure the effect of cell phone separation on anxiety and concentration. It is hypothesized that those who are separated from their cell phones will have an inferior performance on the post-video questionnaire than those who are not separated from their cell phones. It is also hypothesized that those who are separated from their cell phones will report higher levels of anxiety and report having more difficulty concentrating during the task than those who were not separated from their cell phones. The goal is to develop more research to support the idea that people have developed a large sense of dependence on their cell phones.

**MITCHELL PARKER** | *MicroRNA Expression Following Lipopolysaccharide-Induced Inflammation of Rat Testis*

Chief Advisor: Dr. Michael Palladino  
Second Reader: Dr. Jeffrey Weisburg

MicroRNAs (miRNAs) are a group of small RNA molecules that do not encode for proteins. Instead, they regulate gene expression. Reproductive biologists are interested in miRNAs because proper expression of these molecules has been linked to normal testis development and spermatogenesis, while atypical expression of certain miRNAs has been implicated in testicular cancer formation and male infertility. Our lab is interested in how miRNAs may be involved in defending the male reproductive tract from infection and the response to inflammation. We hypothesized that control of gene expression by miRNAs plays a significant role in the antimicrobial protection of rat testis and the response to inflammation. The overall goal of our research is to determine which miRNAs are involved in regulating inflammation of the testis in response to infection. The objective of this study in particular was to identify inflammatory-related miRNAs (miRNAs that regulate inflammatory genes) that are up-regulated and/or down-regulated following lipopolysaccharide (LPS)-induced inflammation of rat testis. LPS is a common component of bacterial cell walls that provokes a strong inflammatory response, in the testis and other tissues of the body, when introduced into the bloodstream. In this study, a Qiagen Rat Inflammatory Response & Autoimmunity miRNA PCR Array (MIRN-105Z) was used to evaluate expression of 84 inflammatory-related miRNAs. Testis total RNA was purified from retired Sprague-Dawley breeder rats that were sacrificed 3 or 6 hours after receiving a 5 mg/kg injection of LPS (n=4) or saline (n=2), and examined by quantitative real-time polymerase chain reaction (qPCR). Results showed 5 inflammatory-related miRNAs with a greater than 2 fold down-regulation ( $p < 0.05$ ) in rats from the 3h group (let-7f-5p, miR-200c-3p, miR-23a-3p, miR-23b-3p, and miR-98-5p), and 5 inflammatory-related miRNAs with a greater than 2 fold down-regulation ( $p < 0.05$ ) in rats from the 6h group (miR-17-5p, miR-19a-3p, miR-34a-5p, miR-34c-5p, and miR-449a-5p). Review of the literature has revealed that these miRNAs also play major roles in the maintenance of fertility (let-7f, miR-200c, miR-17, miR-34a/c, and miR-449a), formation and elimination of cancer (all significant miRNAs), and development of the male reproductive tract (let-7f, miR-17, miR-19a, miR-34a/c, and miR-449a). Further study of these miRNAs, and their roles in male reproductive tissues, might lead to advanced therapeutics for treatment, novel biomarkers for detection, and a greater understanding of male reproduction and related health issues.

**STEPHANIE PUWALSKI** | *Exploring College Students' Perceptions of Gender Inequality in Higher Education: A Comparison of STEM and Non-STEM Majors*

Chief Advisor: Dr. Johanna Foster

Previous research on behalf of social scientists has revealed Higher Education in the United States to be an institution where gender inequality is socially reproduced. Historically, STEM (science, technology, engineering, and math) fields have been recognized as particularly hostile academic environments for women, providing perceptions and messages about who does and who does not belong in these areas. As a result, STEM fields are a major area of concern. The purpose of this research was to study contemporary STEM students' attitudes and awareness of gender inequality and hostile climate by major and gender in particular, and to compare these to non-STEM majors' perceptions of gender inequality and hostile climate in their classrooms. The theoretical framework for this study was oriented by Feminist Theories of inequality. Being a system of power, gender functions to reinforce systems of domination and subordination through the socialization of men and women into their acceptable place. In this project, I employed a quantitative research design that relied on written surveys as my data collection strategy. The unit of analysis was an undergraduate student at Monmouth University, having either a STEM or non-STEM major. Overall, this research attempted to unveil whether or not students' own experiences of hostile climate, and/or the perceptions of the persistence of gender inequality in their academic field, is more pronounced for students in STEM majors or non-STEM majors, and if so, in what ways.

**CARLIE TILL** | *My Childhood Traumas: A Series of Short Essays*

Chief Advisor: Prof. Alexander Gilvarry

Childhood memories are so clear for people as they grow up because children experience love, loss, excitement, fear, and all other emotions in a much stronger way because they lack experience dealing with these feelings and children's brains are still developing. I have used my research on this theory to develop a series of short personal essays regarding my biggest childhood traumas in vivid detail.



## Recent Graduate Schools

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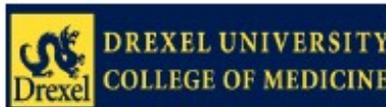
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