



16th Annual _____
**CELEBRATION OF
STUDENT RESEARCH,
SCHOLARSHIP & CREATIVE WORK**
Friday, January 29, 2016 | Wabash College | Detchon Center

Welcome and Introduction

Welcome to the 16th Annual Celebration of Student Research, Scholarship, and Creative Work at Wabash College. For the past 15 years, the College has recognized in a proud and public way the creative accomplishments of Wabash students. We celebrate not only the particular achievements of individual students, but also a deeply embedded ethos of the College. The impressive breadth and quality of student creative work is evidence of the challenge and change that marks the Wabash experience.

This program is dedicated to the memory of Paul Caylor McKinney ’52, who passed away in 2003 after a courageous battle with cancer. Dr. McKinney proudly served the College for more than half a century as chemistry teacher, department chair, division chair, and Dean of the College. He was an exemplar of the liberally educated person whose interests ranged from quantum mechanics to Plato, from playing the piano to pondering Nietzsche. He acted in Wabash College Theater productions and was often found backstage working on difficult equations in his notebook. He was my mentor and friend, a master teacher who helped countless Wabash students develop their creativity and love of the liberal arts. Among Wabash men, he would well understand and appreciate everything presented today; he would be the first to celebrate the successes of Wabash students and faculty members.

Close collaboration between Wabash students and faculty across the College is a hallmark of our culture, a labor of pedagogy and love that makes a difference for our students. It is a special pleasure to introduce some of the results of that collaboration in these presentations. Our thanks go to the students who are prepared to teach the Wabash community about their good work and to the faculty and staff members who have devoted considerable time helping students in their research and creative productions.

A conference of this size and scope would not be possible without the dedicated work of many people. I want personally to express my thanks to the planning committee: Chair Lon Porter, Jeff Beck, Crystal Benedicks, Matthew Carlson, Suting Hong, and Colin McKinney. Adam Phipps and his students contributed to the poster production, as have other Media Center and IT Services staff; Becky Wendt formatted and prepared the program for printing; Campus Services, and Mary Jo Johnston and her Bon Appetit staff make the logistical support appear effortless. We also extend gratitude to Kitty Rutledge and Chris Duff for their help. We are grateful to all of you whose attendance supports this community Celebration.

—Scott Feller, Dean of the College

Schedule for Oral Presentations

Oral presentations will begin at 1:10 p.m. and continue every 20 minutes with a ten-minute break at 2:30 p.m. The last sessions begin at 3:20 p.m. In general, students will present information for 12-15 minutes with a few minutes for questions and passing time. Please see the following two pages for a list of oral presentations by room location and time slot. Names of the presenters, as well as their sponsors and abstracts, are listed in alphabetical order beginning on page eight.

Schedule for Posters and Exhibits

Students will present and discuss their posters and exhibits in 90-minute increments beginning at 1:00 p.m. across Detchon International Hall. You will find a list of presenters and their locations — sorted by poster number and alphabetically by lead presenter — beginning on page six. Names of the poster presenters and co-presenters, as well as their sponsors and abstracts, are listed by poster number beginning on page 20.

Schedule of Oral Presentations by Time Slot and Location

Detchon 111

1:10	Nicolas Fishe	United in Shame
1:30	Benjamin Cramer	The Clothing Makes the Colonial
1:50	Immanuel Mitchell-Sodipe	<i>On Walking</i> : Selected Poems by Immanuel Sodipe
2:10	Christian Lopac	Desolation and the Dharma: <i>Desolation Angels</i> and the End of Kerouac’s Religious Trek
2:30	Break	-----
2:40	Taylor Miller	Pushing the Boundaries of Contemporary Writing
3:00	Ian Artis, Jr.	<i>Sunburn</i> - Flash Fiction and Various Poetry
3:20	Noah Eppler	<i>Blackfoot</i>

Detchon 112

1:10	Noah Eppler	Revolution and a New Body: Cross-Gender Casting in Seventeenth and Eighteenth Century England
1:30	Alexander Hernandez	Grindr
1:50	William Yank	Grand Theft Auto: Masculinity Edition
2:10	Max Lawson	Father Figureless: The Myth of Being Raised by a Single-Mother
2:30	Break	-----
2:40	Jake Thompson	The Development of the Sicilian Mafia in the United States
3:00	Beau Green & Derek Fox	How Biological Differences Contribute to Classroom Behavior: The “Achievement Gap”
3:20	Alexander Hernandez	Spanish Heritage Speakers

Detchon 209

1:10	Paul Snyder	Martyrdom, Fantasy, and Kim Davis: How the Kentucky Clerk Created a Narrative of Religious Persecution
1:30	Jack Kellerman & Connor Rice	The Technical Sphere’s Effect on the Public Sphere in Deliberation
1:50	Mason Zurek	Empowering Black Lives Matter through the American Dream
2:10	Jared Wolfe	Women in Baseball History
2:30	Break	-----
2:40	Kyle Stucker	Reagan and Religion: Crafting the Evil Empire
3:00	Logan Taylor	End of Days: Earth, Water, Air, and Fire in Pliny’s Vesuvius Narrative
3:20	Zac Maciejewski & Mason McKinney	All <i>Pecha Kuchas</i> Lead to Rome: Creative Reflections on an Immersion Trip

Detchon 211

1:10	Andrew Powell & Reno Jamison	Mobilizing the Electorate: Evidence from the 2014 Senatorial Candidate Twitter Feeds
1:30	Shane Xuan	Why Do Chinese Students Study Abroad: An Empirical Study on “Brain Drain” in Developing States
1:50	Mohammed Hasnat	The Plethora of “Mean Tweets” Exchange during the 2014 Senatorial Election
2:10	Yuese He	An Alternative to Western Liberalism-Chinese Confucian Perfectionism
2:30	Break	-----
2:40	Derek Andre	Lessons in Spectacle and Identity from Siena’s <i>Palio</i>
3:00	Jacob Roehm	Aristotle’s <i>Politics</i> : Citizenship and Wealth
3:20	Shane Xuan	A Research Agenda on Autocratic Domestic Audience Costs

Detchon 212

1:10	William Kelly	Utilizing Liberal Arts Skills through America’s Longest War
1:30	Brock Hammond	Opportunity Wasted: The West India Company and New Netherland, 1621-1664
1:50	Nathan Muha	Wabash Navarro Project
2:10	Keanan Alstatt	The <i>Kora</i> (Harp-lute): One of Africa’s Complex Chordophones
2:30	Break	-----
2:40	Dylan Miller	Behind the Mask: A Look at the Representations of Homosexuality in <i>The Public</i>
3:00	Nathan Bode	<i>Un Momento Corto Pero Feliz</i> : Literary Liberty in the Work of Mauel Puig
3:20	Yuese He	Fear and War: China, Vietnam and the World beyond Asia during the Third Indochina War

Detchon 220

1:10	Cameron Dennis	Project GRAND: A Cosmic Ray Experiment
1:30	Minh Quan Le Thien	Superconducting Vortices on a Periodic One-Dimensional Patterned Surface
1:50	Inbum Lee	Relativistic Coupling between the Center of Mass and Internal Dynamics of a System
2:10	Bilal Jawed	Sertraline, Sickness, and Stigma: Conducting a Clinical Drug Trial in Uganda
2:30	Break	-----
2:40	Graham Redweik	Protein Kinase C Mediates Endoplasmic Reticulum Stress-Induced Gene Expression in Gonadotropin-Releasing Hormone Neurons
3:00	Travis Flock	Elevated Circulating Octopamine Increases Anti-Predator Aggression in Bark Scorpions

Schedule of Poster Presentations and Exhibits

Session 1 — 1:00 p.m. to 2:30 p.m.

No	Presenters	Title
1	Ian Artis, Jr.	It's Really Not Gay: Racialized Sexuality, Jane Ward, and Sex between Straight White Men
3	Allen Betts	Wnt Gene Expression in Regenerating <i>Nematostella vectensis</i> in Alsterpaulone
5	Brady Boles	Home Range Size and Injury Patterns as a Result of Eastern Box Turtle Temperament
7	Zachery Campbell	Regulation of Gonadotropin-Releasing Hormone Production by Endoplasmic Reticulum Stress and Kisspeptin: Implications for Obesity and Infertility
9	Jonathan Daron & Timothy Riley	Nuclear Physics: Ultra-High Speed Electronics and Data Structures
11	Darren DeRome	Cell Proliferation in Regenerating
13	Nick Etter	Cooperstown: More than a Field Trip
15	Brian Hayhurst & Mason Keller	Adaptively Weighted Least-Squares for Fluid Dynamics
17	Free Kashon	Coevolved Species in a Non-Native World
19	Inbum Lee & Tianhao Yang	Magnetic Field of Superconducting Loops
21	Charles Mettler & Luke Gunderman	Indiana Orchids and their Mycorrhizae
23	Eric Need	Placing Limits on New Forces from the Decca Experiment
25	Adam Rains	Trait Mindfulness is not associated with the Greater use of Hippocampally-Dependent Navigation Strategies
27	Jared Santana	The Role of JNK Signaling in ER Stress-Induced Inflammation in Gonadotropin-Releasing Hormone Neurons
29	Benjamin Washer & Mazin Hakim	Developing Scientific Instrumentation using Digital Design and 3D Printing
31	Aaron Wirthwein	Optimizing Interactions in Quantum Plasmonics

Schedule of Poster Presentations and Exhibits

Session 2 — 2:30 p.m. to 4:00 p.m.

No	Presenter	Title
2	Aaron Becker	Direct-Current Cardioversion for Patients with Atrial Fibrillation: A 2-year Retrospective Study
4	Joshua Bleisch	Implicit Biases: The Effects of Race, Age, Gender, and Education on Senate Confirmation Times of Federal Judges
6	Ty Campbell	Can White People be Allies in the War Against Racism?: An Analysis of Plaatje, Gordimer, and Biko
8	Cole Chapman & Jacob Alaniz	A Simple and Inexpensive 3D Printed Filter Fluorometer Instrument
10	Wesley Deutscher, Justin Miller, & Kyle Stucker	Development of Novel Rhodamine Dyes and Utilizing Computer Modeling as a Means of Predicting Observed Solvent-Dependent Equilibria
12	Luke Doughty	Unmaking Men in Antiquity: Ovid's <i>Apollo and Daphne</i>
14	Max Gallivan & Chris Shrack	Testing Novel Phenolic Fluorophores as Palladium Sensors at Different Concentrations
16	Abraham Hall, Sam Vaught, & Paul Snyder	Research and the Wabash Pastoral Leadership Program
18	Inbum Lee & Tianhao Yang	Magnetic Field of Superconducting Loops
20	Cordell Lewis, Karl Prasher, & Bryan Tippmann	Towards the Detection of La Ions via the Optogalvanic Effect
22	Immanuel Mitchell-Sodipe	On the Lack of Space for Women in Black Analytical Frameworks and Liberation Politics
24	Jake Norley & Connor Smith	Development of an Optimized Trypsin Digestion System
26	Timothy Riley	Simulating Bacteria Movement Through Micro-robotics
28	Cameron Stepler	Synthesis of Effective Water-Soluble Fluorescein Dibenzyl Ether Cytochrome P450 Substrates
30	Korbin West	Ramachandran Outliers in Ligand-Induced Protein Structural Changes
32	Yang Yang	Towards Generation of Continuous-Variable Cluster-State

Oral Presentations (Alphabetical by Presenter)

Presenter: Keanan Alstatt
Sponsor: James Makubuya (Music)
Title: The *Kora* (Harp-lute): One of Africa’s Complex Chordophones

In today’s day of age around the world, music plays an important role in many people’s lives. Throughout the world, there are instruments that are symbols of major significance in the respective cultures. One of those instruments is the harp-lute generically referred to as the *kora*. Commonly used in the West African region, the *kora* is found in many facets of popular culture. From rites, rituals and events like weddings to warrior celebrations as well as the Senegalese national anthem, the *kora* plays an important role in many people’s lives. Hoping to get more exposure out about the instrument, I set out to digest as much information about this instrument as I could. After briefly describing what the *kora* is, my presentation will reveal my findings of this instrument and its powerful impact on popular culture. Through the use of audio-video clips in part, the information that will be presented and discussed includes the definition, history, design, and the musical as well as the contextual significance of this powerful harp-lute – the *kora*.

Presenter: Derek Andre
Sponsor: Alexandra Hoerl (Political Science)
Title: Lessons in Spectacle and Identity from Siena’s *Palio*

While it seems quite contrary to claim that American public spectacles - with our supposed deep and lasting connection to a common civic identity - create a somewhat weak connection between the individual and the common, we find that this is the case when many large-scale, post-capitalist American events are compared with their European counterparts. In this presentation, I will contend that the *Palio*, and civic festivals sharing its pre-capitalist aspects, provide a stronger link between the individual and the civic than do many similar American examples for three reasons: first, American spectacles typically lack the deep connection to place associated with the *Palio* and similar events, second, the capitalist framework in which American spectacles exist constrains the ability of said spectacles to function primarily for civic purposes, and finally, that the funding sources for American spectacles tends to be derived from decentralized sources in a way formerly not present with the *Palio*. Ultimately, I hope to provide some commentary on how American public spectacles may be altered to more easily promote strong national, regional, or local identity in ways they do not currently do so.

Presenter: Ian Artis, Jr.
Sponsor: Eric Freeze (English)
Title: *Sunburn* - Flash Fiction and Various Poetry

In this story, I examine the weight of unsaid words through two young men who share a simple, yet head-thudding moment in a class held outside. In a little over seven hundred words, I try to display a vignette of an extremely vulnerable but carefully calculated moment shared under a blistering sun. The sun, sustaining and life giving as well as sadistic and detached, plays a central role in the lives of the two young men. *Sunburn* attempts to measure the distance of unspoken closeness. By making each word do work, and carefully constructing each scene, I try to create a dizzying and controlled moment in which not much matters but what isn’t there. *Sunburn* is a story in which what isn’t explained, described or explicated may just be the key to understanding the rules which govern the moment which binds these two young men together in, “their favorite heaps of fever hot daydreams.” I will also be reading from a selection of short poems on various topics ranging from innocence to loss, embarrassment to triumph.

Presenter: Nathan Bode
Sponsor: Ivette Wilson (Modern Languages & Literatures)
Title: *Un Momento Corto Pero Feliz*: Literary Liberty in the Work of Mauel Puig

Focusing on the work of Argentine author Manuel Puig, I examine his novel *El beso de la mujer araña* for various forms of literary escapes. While the plot and setting of the story, told from the cell of two Argentine prisoners, clearly addresses the desire to physically escape from prison, the interactions between the two protagonists examine what it means to escape at a much deeper level. Through the symbolic recounting of various films, the characters examine their own feelings and roles that society has determined for them, and come to find that they may have more freedom and control over themselves within their cell walls than out. Finally, I suggest that by the very structure of Puig’s novel, and his strategic lack of an omniscient or personal narrator, he has granted his characters the ultimate form of literary freedom in allowing them to develop and describe their own true characters for the reader, rather than having a narrator develop their identities for them. Puig’s entire work examines the raw human desire to be free, both physically and socially.

Presenter: Benjamin Cramer
Sponsor: Agata Szczeszak-Brewer (English)
Title: The Clothing Makes the Colonial

This paper approaches two works of South African Literature, J.M. Coetzee’s In the *Heart of the Country* and Bessie Head’s *A Question of Power* as case studies for Franz Fanon’s theories presented in *Black Skin, White Masks*. I examine how colonial mindsets persist because of interpellation (internalized and sometimes subconscious belief in the inferiority of one’s own culture due to colonial influence) and how that violence is reproduced as neocolonialism. In both works, the border between oppressor and oppressed is present in a character’s manner of dress. With cultural research from present day South Africa as well as a historical perspective provided by guides and museums, I examine some of the history of clothing in South Africa. I pay brief attention to how styles of dress were sometimes imposed as a way to create and enforce the Colonial and Apartheid racial borders, and other times simply were a side effect and indicator of already existing differences. With support from other critical sources, I make the case that ending the cycle from colonial to neocolonial violence was Nelson Mandela’s key victory, and a part of that ending that cycle was his choice of clothing.

Presenter: Cameron Dennis
Sponsor: Danielle McDermott (Physics)
Title: Project GRAND: A Cosmic Ray Experiment

Project GRAND, a cosmic ray experiment, is located north of the Notre Dame campus. Spanning a 100 by 100 square meter area, this detector has been used to study gamma ray burst events as well as solar phenomenon such as the Forbush decrease. The quality of the data from this and previous years was improved this summer by utilizing a pressure correction and generating accurate time data. A new backup system was also employed to ensure that the data exists on multiple drives.

Presenter: Noah Eppler
Sponsor: Eric Freeze (English)
Title: *Blackfoot*

In this short story about art, longing and the masks we wear every day, a young man named Elihu Thompson, after seeing a bohemian woman playing guitar on the street, begins a search to discover who she really is.

Presenter: Noah Eppler
Sponsor: Dwight Watson (Theater)
Title: Revolution and a New Body: Cross-gender Casting in Seventeenth and Eighteenth Century England

Challenging the narrative of history that once women were permitted to perform onstage actors almost always played roles that conformed to their gender identity, this project delineates a brief history of cross-dressing in early modern England as well as traces the lineage of cross-gender casting in Restoration and eighteenth century English drama.

Presenter: Nicolas Fishe
Sponsor: Agata Szczeszak-Brewer (English)
Title: United in Shame

In this paper, I talk about the racist treatment and denial of basic human rights inflicted upon Joseph Danticat by agents of American Immigration Services. Joseph fled Haiti seeking asylum only to die in U.S. custody. His death occurred after a series of dehumanizing injustices on both a systematic and individual level. In addition, further research exposes widespread inhumane conditions inflicted upon asylum seekers by the agents of the United States. Finally, I conclude that the maltreatment of asylum seekers must come to the forefront of American immigration debate.

Presenter: Travis Flock
Sponsor: Bradley Carlson (Biology)
Title: Elevated Circulating Octopamine Increases Anti-Predator Aggression in Bark Scorpions

Examining how hormones modulate behavior has long been a topic of investigation. Past findings have revealed that monoamines are particularly important for the fight-or-flight response in insects and arachnids. However, no work has investigated how an ancient and highly evolutionary specialized lineage – scorpions – respond behaviorally to monoamines. In the present study, we set out to investigate how scorpions respond to octopamine, a putative fight-or-flight hormone, and phentolamine, an antagonist of octopamine. We hypothesized that octopamine would cause an increase in aggression towards a perceived threat, and that phentolamine would cause a decrease in aggression. We found that octopamine did result in a significant increase in aggression, and phentolamine did not affect aggression. We conclude that scorpions use octopamine as a fight-or-flight response modulator, and that scorpions may be non-responsive to phentolamine because of evolutionary divergence.

Presenters: Beau Green & Derek Fox
Sponsor: Michele Pittard (Educational Studies)
Title: How Biological Differences Contribute to Classroom Behavior: The “Achievement Gap”

The purpose of this presentation is to explain why there is an achievement gap between males and females in today’s classroom environment. Our general focus age we studied was the late elementary and early adolescence stages of student development (roughly 4th grade to 8th grade). We discussed different types of biological differences between boys and girls that really set them apart in the classroom setting. Things such as neurotransmitters, hormones, and brain anatomy explain the presence of the achievement gap in today’s educational system. One neurotransmitter we discussed with the chemical serotonin. Serotonin, located in the prefrontal cortex of the brain, allows us to conduct conscious decision making and is also known as the “calming” neurotransmitter. Shockingly, boys contain 52% more serotonin than girls, but female brains process this chemical more efficiently, which gives them an advantage. One of our hormones discussed was testosterone. Although this is mildly present in females, testosterone is the driving force behind male development, especially throughout puberty. This chemical provides the male body with a dominating presence of competitiveness, aggression, self-assertion, and self-reliance. These all affect classroom behavior because these characteristics are constantly taking over, and the confined classroom setting of “sitting still” most of the day has a negative effect on males in the classroom. The achievement gap is evident in the classroom today, and we are here to use our research from professionals like Michael Gurian (founder of Gurian Institute) and explain why this is happening.

Presenter: Brock Hammond
Sponsor: Sabrina Thomas (History)
Title: Opportunity Wasted: The West India Company and New Netherland, 1621-1664

For half of the seventeenth century, New Netherland acted as the sole Dutch possession in continental North America, composing parts of modern day New York, Delaware, Connecticut, and New Jersey. The United Provinces (the Netherlands) established a presence in the colonial world soon after winning their independence from Spain in 1581. In 1621, the United Provinces granted the West India Company a monopoly on Dutch Atlantic holdings, which gave the West India Company exclusive right to govern and dictate economic policy of New Netherland. However, company representatives on both sides of the ocean struggled to define and implement such policies. Consequently, the mismanagement of New Netherland by the West India Company resulted in the colony’s economic and political failure. Ultimately, the colonial administration struggled to establish infrastructure, protect trade networks from European competition, and waged unjustifiable wars against Native Americans. These political and economic blunders rendered New Netherland helpless to a British attack in 1664, resulting in the demise of New Netherland.

Presenter: Mohammed Hasnat
Sponsor: Shamira Gelbman (Political Science)
Title: The Plethora of “Mean Tweets” Exchange during the 2014 Senatorial Election

In the midterm election of the 114th Congress senate candidates from both major parties in the United States used twitter extensively to address the public for political campaigns. Some candidates observed an advantage in twitter over more traditional communications media and used the platform to expose the weaknesses of their opponent by posting negative remarks or “attack tweets”. So which major party candidates were highly involved in posting such attack tweets or “mean tweets”? In order to identify candidates from both major parties, I examined how 27 senate candidates utilized attack phrases on their opponents during 2014 election. The study was done by analyzing around 8400 tweets from these 27 candidates in the month leading up to the midterm election. The attack tweets were then individually coded and further statistical results from average attack tweets were produced. To incorporate specific details tweets were sorted and analyzed using variable factors including the state, party, incumbency of seat, race competitiveness, cook ratio and President Obama’s percentage of vote in that state. The result concluded that senate candidates from Republican Party had higher number of attack tweets or “mean tweets” in competitive races.

Presenter: Yuese He
Sponsor: Alexandra Hoerl (Political Science)
Title: An Alternative to Western Liberalism-Chinese Confucian Perfectionism

My essay is about Western liberalism and its possible alternatives. In the contemporary political theory, Western liberalism is one of the most popular theories in the field of political philosophy. This political doctrine often refers to the fundamental conception of the western society and individualism. Liberalism’s central ideas consist of the notions of justice, fairness, and individual rights. In a word, liberalism is an ideology that advocates individual freedom, free political institutions and religious toleration. In the model of western liberalism, the individual is the basic unit of the entire society, and the role of the government is to ensure the individual rights can be protected under laws and legitimate use of force. This essay argues that perfectionism, which is the state’s non-neutral promotion of a particular valuable way of life, is a possible theory that shares the same value as the western liberalism. The principle of Chinese Confucianism Perfectionism is that the “good” of community is prior to the “good” of individuals. Thus, the major aim of the state is to help people pursue the good life by proper means. I will use Chinese Confucian Perfectionism to demonstrate the significance of perfectionism both in the ideal and the reality.

Presenter: Yuese He
Sponsor: Qian Pullen (Modern Languages & Literatures/History)
Title: Fear and War: China, Vietnam and the World beyond Asia during the Third Indochina War

Why did China and Vietnam engage in an unexpected border war with each other in 1979, especially since they had been allies in a conflict that ended just four years prior? My paper argues that changing international alliances during the 1970s led to a recalculation of alliance politics between China and Vietnam, leading to the outbreak of the Third Indochina War. I use Walt’s The Origins of Alliances, which argues that the main mechanism of forming and transforming of alliance partners relationship is the fear of threats, to explore the changing calculations of the Sino-Vietnamese partnership. Thus, states ally to balance against threats rather than solely against a state’s power. The emphasis on threat will be incorporated into an examination of the larger Cold War relationships between China, Vietnam, the U.S. and the Soviet Union from the Second Indochina War to the Third Indochina War. In so doing, my research shall contribute to Mearsheimer’s (2001) theory of “offensive realism,” in examining the motivations and consequences of the Third Indochina War by emphasizing how changing alliance politics coupled with a desire to maximize security led to a recalculation of Sino-Vietnamese relations.

Presenter: Alexander Hernandez
Sponsors: Deborah Seltzer-Kelly (Educational Studies) & Zachery Koppelman (Writing Center)
Title: Spanish Heritage Speakers

When dealing with Spanish Heritage Speakers, schools officials should take a better approach by leaving the melting pot approach, which entitles of total assimilation, and move towards a mosaic approach, which limits assimilation to the bare minimal and enables the student to use what they know to expand their education. This would do the following criterion: The first criteria, is to decrease the negative attitudes (such as “othering”) and breakaway the social hierarchies that exist within the school setting. The second criteria, is for school officials to have more flexibility to customize curriculum, programs, and policies to their students The third criteria is to have community engagement by offering classes, events, and resources that help create a stronger connection with the community and the students. The fourth criteria, is to enable students to use their background knowledge and skills instead of ignoring them completely, which makes it easier to learn English while creating a stronger Spanish foundation. This would enable the student explore who they are and their academic and civic potential.

Presenter: Alexander Hernandez
Sponsor: Crystal Benedicks (English)
Title: Grindr

The purpose of this paper was to find the effects that Grindr has on the gay community. Even though the initial intent of Grindr was to fortify the gay community by providing a venue for gay, bi, and curious to interact. Even though the users define the application, Grindr hinders the community tremendously because it allows the following: weak interpersonal skills, racism, Queerphobia, superficiality, boyfriend twin syndrome, racism, and the Peter Pan effect. In addition, the only way for the user to be considered as the cream of the crop, the user must pass three examinations, the fit, macho, and mirror test. Do not get me wrong, Grindr does also provide some positive and neutral outcomes, and it really depends on the users to determine those outcomes. However, the results were mostly negative.

Presenter: Bilal Jawed
Sponsor: Eric Wetzel (Biology)
Title: Sertraline, Sickness, and Stigma: Conducting a Clinical Drug Trial in Uganda

Cryptococcal meningitis (CM) is an opportunistic infection that is rarely found in healthy individuals but remains a risk in individuals with HIV/AIDS or other forms of immunosuppression. The disease is a debilitating infection of the meninges with a 10-week mortality rate between 24% and 37% under optimal conditions. In Sub-Saharan Africa, CM is second only to tuberculosis in all-cause mortality, and globally has a burden of nearly 1 million cases per year. A very high HIV-1 prevalence rate of 7.2% in Uganda, in conjunction with a severe deficit in proper CM management, results in extremely poor health outcomes. The ASTRO-CM study features a double-blind, randomized phase-III drug trial seeking 450 enrollments.

The primary study hypothesis predicts adjunctive sertraline treatment results in faster fungal clearance from the brain parenchyma and improved 18-week survival compared to standard CM therapy. Positive results from this study would provide a desperately needed inexpensive and accessible drug to combat CM in resource limited settings. Unlike drug trials in developed countries, the ASTRO study faces unique hardships such as stigma, patients lost to follow up, consent issues, poor drug adherence, and lack of proper tools, among others. This presentation will discuss these challenges in context of the ASTRO study and methods to combat them.

Presenters: Jack Kellerman & Connor Rice
Sponsor: Sara Drury (Rhetoric)
Title: The Technical Sphere’s Effect on the Public Sphere in Deliberation

Deliberation has the capacity to encourage issue learning amongst communities, but a persistent problem is how to encourage integration of high quality information integration. Citizens often need to access technical information as part of issue learning. Using applied rhetorical criticism to examine a “questions of fact” exercise in a deliberation, this essay argues that designing deliberative processes with information opportunities can have positive impacts on deliberation quality, but that skilled facilitation may aid the process. Our research was entirely focused on a deliberation that took place in a Biology course given to students at Wabash College during the 2014 school year. Using transcripts and the audio recordings, we were able to gain an understanding of how participants in a deliberation are able to actively participate. We also became informed of the negative implications that arose from the deliberations when there was not an emphasis in these “questions of fact.” Our evaluation of the deliberation focused on the participant’s ability to utilize their own “questions of fact,” as well as how they were able to respond to their fellow participants questions. Our findings further understandings of how public discourse can encourage the development of citizens within a community.

Presenter: William Kelly
Sponsor: Sabrina Thomas (History)
Title: Utilizing Liberal Arts Skills through America’s Longest War

In April 1970, President Richard Nixon expanded the increasingly unpopular Vietnam War by sending US military forces into Cambodia. In response, the antiwar movement intensified across America, especially on college campuses. Small liberal-arts colleges such as Wabash College in Crawfordsville, Indiana used a non-violent, liberal-arts approach - critical thinking and problem solving - to their anti-war protests and strikes. The actions of liberal arts students accelerated the efficiency of their antiwar demonstrations through educational sessions for students and the community in the model of liberal-arts education. In contrast, the often-violent demonstrations of larger public state institutions proved less effective in protesting American military action. At Kent State University, antiwar protests developed violently, a result of the public school education model and the absence of critical thinking and problem solving--skills not taught at the institution. Such demonstrations failed to advance the goal of protest -- to stop the war in Vietnam. Instead, the demonstrations supported the negative stereotypes of college students who protested the war. This paper argues that the antiwar demonstrations at small liberal arts schools, like Wabash College, during May 1970 generated a more productive outcome because student protests reflected the educational structure of the liberal arts.

Presenter: Max Lawson
Sponsor: Warren Rosenberg (English)
Title: Father Figureless: The Myth of Being Raised by a Single-Mother

In 1997 I was one of 3,882,000 babies born in the United States, and as such, my life as a statistic began. As I grew older and embraced my place in the world, I was confronted by the often negative stereotypes and statistics that accompanied being raised by a single parent. According to many studies, I should be a chemically dependent, aggressive criminal, living in poverty. Since my reality is far from this single story, I would like to present my research in support of successful and well-adjusted boys being raised by their single mothers.

Presenter: Inbum Lee
Sponsor: Dennis Krause (Physics)
Title: Relativistic Coupling between the Center of Mass and Internal Dynamics of a System

Einstein’s well-known equation $E=mc^2$ suggests that the internal energy of a system should be included in the mass of the system. Pursuing this idea yields the coupling between the center of mass motion and the internal dynamics of the system, and its effects are examined through two examples, a spring-mass oscillator in a rocket and a two-level atom bound in an infinite potential well. As a result, it is revealed that the coupling causes time dilation of the internal dynamics and, in the quantum case, a loss of interference due to entanglement.

Presenter: Minh Quan Le Thien
Sponsor: Danielle McDermott (Physics)
Title: Superconducting Vortices on a Periodic One-Dimensional Patterned Surface

Type-II superconductors are one of the most important discoveries in physics in the last century with a wide range of applications from MRI machines to particle accelerators. Unlike type-I superconductors, type-II superconductors do not exhibit a complete Meissner effect – the expulsion of magnetic field inside the superconductor during the transition from normal-conducting state to superconducting state. This allows magnetic flux to enter the material in quantized packets without destroying the superconductivity. Hence, there will be superconducting currents circulating around these magnetic flux packets, forming quantum vortices. However, as these vortices start to move, they dissipate energy and thus create an apparent electrical resistance to type-II superconductors. Therefore, it is important to study how we can pin these vortices. In our simulations, we used Langevin molecular dynamics to study the statics and dynamics of the vortex state in the presence of a quasi-one-dimensional periodic modulation produced by a sinusoidal substrate. We found that the critical depinning current – the point when vortices start to move – depends greatly on the commensuration of the vortex lattice constant and the substrate lattice constant. Furthermore, we also observed a variety of chain-like and crystalline structures as a result of the competition between commensuration and incommensuration.

Presenter: Christian Lopac
Sponsor: Marc Hudson (English)
Title: Desolation and the Dharma: *Desolation Angels* and the End of Kerouac’s Religious Trek

A year after publishing *On the Road*, detailing a redemptive rediscovery of life, Jack Kerouac took a decidedly inquisitive stance with *The Dharma Bums*. The reader of the latter work notes its quest through both Buddhism and Catholicism, but one will also observe Kerouac’s lack of an answer to these religious questions. Rather, *The Dharma Bums* ends only with Kerouac unable to devote himself truly to Buddhism, due to his isolation from the Buddhist community (sangha). Kerouac’s explorations continued, and, while darker, *Desolation Angels* presents an answer to the questions of *The Dharma Bums*. In *Desolation Angels*, Kerouac stands between the figures of Christ and the Buddha, both constituting religious ideals, but, ultimately, he finds that his mother represents a figure greater than either of these holy men. Beyond counting merely as a resolution to the questions of *The Dharma Bums*, Kerouac’s conclusion in *Desolation Angels* carries a deeper significance. As a result of viewing his mother in this light, Kerouac constructs a new approach to religion for himself, which emphasizes human possession of divine qualities.

Presenters: Zac Maciejewski & Mason McKinney
Sponsor: Jeremy Hartnett (Classics)
Title: All *Pecha Kuchas* Lead to Rome: Creative Reflections on an Immersion Trip

Over Thanksgiving Break, we traveled to Italy as part of an immersion course entitled *The Art of Empire in Ancient Rome*. For our final project in the course, we drew on a medium that started in Japan and has become popular with architects worldwide – a *Pecha Kucha* consists of a barrage of 20 slides, each shown for 20 seconds, with voice narration. Our presentation will consist of screening our two projects and some reflections about this form of assignment. The first *Pecha Kucha*, *Rome & Its Layers: A Journey Explained through an Italian Sub*, describes the multilayered architecture of Rome that we witnessed on the trip and how the city has built on top of itself over the past 2000 years. The second, *Take It Slow: My Emotional and Intellectual Journey Through the Eternal City*, takes stock of how the emperors of Rome used art and architecture to influence the citizens under their rule, but reflects on how, by dropping our rushing tendencies and taking life slow like today’s Italians, we notice the finer things and savor the succulent details that life puts in front of us.

Presenter: Dylan Miller
Sponsor: Ivette Wilson (Modern Languages & Literatures)
Title: Behind the Mask: A Look at the Representations of Homosexuality in *The Public*

The Spanish playwright and poet Federico García Lorca was known for his daring poetry and revolutionary theater. His three tragedies, *The House of Bernarda Alba*, *Yerma*, and *Blood Wedding*, earned him praise and popularity. However, his play *The Public* was his boldest work ever. It was “a play for the future” as Lorca put it. Due to Lorca’s assassination by the Franco regime during the Spanish Civil War, the play only survived in manuscript form as an incomplete work and was not published until after his death. *The Public* looks at themes of the theater, identity, and more importantly, homosexuality. Designed as a play within a play, the work progresses as a group of actors and the Director attempt to produce a daring representation of *Romeo and Juliet* in which a 15-year-old boy plays Juliet. The symbols and themes in *The Public* work to explain the paradox and duality of homosexual identity. The exploration of homosexuality introduces more questions than answers, but despite the age of the play, its revelations, criticisms, and the bold exploration of homosexual identity remain important and widely applicable today.

Presenter: Taylor Miller
Sponsor: Eric Freeze (English)
Title: Pushing the Boundaries of Contemporary Writing

Today, good creative writing demands innovation. To hook a reader you have to show them an experience that is new and they’ve never before. This is why early in the fall semester I began studying the epistolary format; to innovate my way of writing. Now, I have ventured beyond the barriers of traditional epistolary writing and constructed a narrative told through the form of an Instagram feed. Breaking from traditional form in this manner has pushed me to create new ways to construct a narrative. With only a photo, a caption, hash tags, and comments to work with there is no narrating thoughts or physical action, only the slight glimpse into someone’s life through a photo and caption alongside the comments that serve as a type of communal dialogue. So how does one read an Instagram story? However they would like to. It’s not about reading left to right, up to down; but more to experience it as a whole. My narrative is centered on the account of sadiegram08 and her death. We scroll through her followers’ reactions, some genuine, some not, some far too long, and some riddled with hash tags. Her memory remains idle on the feed.

Presenter: Immanuel Mitchell-Sodipe
Sponsor: Nathaniel Marshall (English)
Title: *On Walking*: Selected Poems by Immanuel Sodipe

I titled this collection of poetry *On Walking* because these poems came to me while walking or doing other activities that require locomotion or simply being cognizant of my body, though Black, still male, cis-hetero, and able bodied. I’m inspired by a few poets, namely: Walt Whitman, Edgar Allan Poe, Emily Dickinson, Langston Hughes, Carl Sandburg, Erykah Badu, and Malcolm London. This collection of poetry – with elements of aggression, mystery, and melody -- is the product of these things.

Presenter: Nathan Muha
Sponsor: Kristen Strandberg (Music)
Title: Wabash Navarro Project

Last semester, Dr. Strandberg’s MUS 205 class (Music Before 1750) visited the rare book and manuscript library at Indiana University to begin our class research project of a book of music, Juan Navarro’s Passion, written and published in early 17th century Mexico. A copy of this text resides at the library, which gave the class an opportunity to view it in person. Navarro’s Passion, published in 1604, is a unique example of a late Renaissance/early Baroque monophonic (one voice) chant, written in colonial Mexico. Because few copies exist, there is little known and published on this book. The project aims to gain insight into the relatively unknown work, including information about the composer Juan Navarro, the historical and musical context (both European and Latin American) of the late 1500s/early 1600s, publishing practices in Mexico at the time of publication, and comparisons to similar works. We also question why the composer wrote this piece at a time when polyphony (two or more voices) was the popular method of composition. In this presentation, we will perform an excerpt of Navarro’s composition and discuss the conclusions we reached by examining primary and secondary sources.

Presenters: Andrew Powell & Reno Jamison
Sponsor: Shamira Gelbman (Political Science)
Title: Mobilizing the Electorate: Evidence from the 2014 Senatorial Candidate Twitter Feeds

Over the last couple of years, we have begun to see social media including Twitter used in ways once never thought possible including in political campaigns. In the 2014 election 70% of Senate candidates had some form of an official Twitter presence, but how did they use it? This project examines how the 76 Senate candidates on Twitter used it in 2014. This was done by analyzing over 8,000 tweets from these 76 candidates in the month leading up to the midterm election. Each tweet was individually coded, and was sub-categorized as an attack, issue, mobilization, or multipurpose tweet. These tweets were all then sorted and analyzed using a number of categories including the state, party, and incumbency or status of the tweeter, as well as the race’s competitiveness, President Obama’s percentage of the vote in that state in 2012, and the number of favorites/retweets it received. The results show that, overall, candidates tweeted more in competitive races, and that party affiliation was a strong indicator of what kind of tweet was used. More specifically we are interested in how and which candidates were able to mobilize voters through Twitter.

Presenter: Graham Redweik
Sponsor: Heidi Walsh (Biology)
Title: Protein Kinase C Mediates Endoplasmic Reticulum Stress-Induced Gene Expression in Gonadotropin-Releasing Hormone Neurons

Cases of obesity are rapidly increasing in the United States and other developed nations. Unfortunately, the consequences of obesity can be devastating, with one specific side effect being infertility. GnRH, or Gonadotropin-releasing hormone, is essential for reproduction, but function of hypothalamic GnRH neurons can be disrupted in obese individuals, which consequentially leads to infertility. Endoplasmic reticulum (ER) stress can promote inflammatory gene expression, leading to further cellular dysfunction; however, the pathway is still unclear. We hypothesized that Protein Kinase C (PKC), a regulatory family of kinases, may be involved in regulation of ER stress-induced gene expression in GnRH neurons. To test this, we measured the expression of Il6 (an pro-inflammatory cytokine) and c-fos (a transcription factor) when treated with tunicamycin (an ER stress-inducing compound) and Gö6983 (a PKC inhibitor). Our results showed an increase in the expression of both IL6 and c-fos expression when treated with tunicamycin, and when cells were treated with both Gö6983 and tunicamycin, transcription of both genes was lowered, demonstrating that PKC is downstream of ER stress, and upstream of Il6 and c-fos. In the future, the relationship between Il6 and c-fos needs to be tested to increase our understanding of ER stress.

Presenter: Jacob Roehm
Sponsor: Adriel Trott (Philosophy)
Title: Aristotle’s *Politics*: Citizenship and Wealth

My presentation will focus on Aristotle’s *Politics*, looking specifically at wealth as a prerequisite for citizenship. Aristotle argues for an intrinsic human drive towards the formation of the political society, but I argue that the necessities of the political life preclude the vast majority from participating in the best life of the polis. From the *Politics*, we find that the drive towards the political community involves more fundamental human characteristics than the mere desire to club together for a common good. It is through the act of political association that man’s deep impulse towards community finds expression, and more importantly it is through citizenship that political association is enabled to function. However, the citizen must be free from the necessities of the everyday life, for these both distract and degrade the citizen from the work of politics. I argue that while there is a natural impulse to form communities and propagate the political life, few can participate. This reading of Aristotle allows us to see that the political community is both prior to the individual and that the citizens, being different from others, must be of a sufficient economic means to participate in political life within the community.

Presenter: Paul Snyder
Sponsor: Sara Drury (Rhetoric)
Title: Martyrdom, Fantasy, and Kim Davis: How the Kentucky Clerk Created a Narrative of Religious Persecution

For this presentation, I will look at the way martyrdom stories, often times fabricated and enhanced over generations of verbal and written communication, lead to a myth of persecution in modern society. The goal is to show how Kim Davis, the Kentucky Clerk who refused to issue same-sex marriage licenses, becomes an agent of God oppressed by an unruly governmental force. More specifically, in changing the isolated focus from Davis to the larger Christian “religious persecution,” Davis creates and gives meaning to a religious community, and is symbolically put to death as a martyr, allowing a new set of martyrs to rise, ready to stand up for their beliefs. This analysis helps to explain how the Davis drama creates symbolic convergence within the tightknit conservative Christian group.

Presenter: Kyle Stucker
Sponsor: Jennifer Abbott (Rhetoric)
Title: Reagan and Religion: Crafting the Evil Empire

Religion has been deeply entrenched in the core values of America since the Puritans first landed on its shores. Religion played a key aspect in the development of individual colonies, the motivation for the American Revolution, and the basis for the Constitution and Bill of Rights. Due to the importance of religion in America, many politicians and societal leaders have invoked religion and morality to support their own opinions. President Ronald Reagan is one of the most frequent users of religion and morality to further his own goals. On March 8, 1983, President Reagan delivers his famous “Evil Empire” speech at the National Convention of Evangelicals. In this speech, President Reagan effectively, and perhaps unethically, utilizes the religious beliefs of his audience through the use of identification, argumentation, and characterization in order to force them to accept his positions on many issues. This rhetorical investigation of how Reagan accomplishes his persuasion examines a description of the artifact and its context, then a discussion of the methodology to analyze the artifact, and finally conducts an analysis of how Reagan uses rhetorical features throughout his address.

Presenter: Logan Taylor
Sponsor: Jeremy Hartnett (Classics)
Title: End of Days: Earth, Water, Air, and Fire in Pliny’s Vesuvius Narrative

The eruption of Mount Vesuvius was one of the most dramatic and far-reaching natural events to befall the ancient world, and as its destructive power was so great, there exists few firsthand accounts of the eruption itself. Nevertheless, of the remaining personal accounts of those who were near enough to see and be affected by the eruption, Pliny the Younger’s is one of the most relevant and most powerful. This presentation will focus on a particular passage in the narrative, one which is a prime example of Pliny’s command of language and the ability of Latin authors to deliver striking visual and narratological content which still holds up to this day. In Pliny’s letter to Tacitus he explores how it truly felt to be experiencing what very well could have been the end of the world, as the author watches the sea lower and observes an enormous cloud of ash and fire building on the horizon. I will be examining Pliny’s word choice and sentence structure, and how these aspects combine in order to give the reader a true sense of the might of this cataclysm.

Presenter: Jake Thompson
Sponsor: Tim Lake (English)
Title: The Development of the Sicilian Mafia in the United States

The Sicilian Mafia’s history is full of criminal acts and a perception of inherent origins. I challenge this perception: the Mafia’s rise to power was due to the fortuitous timing of immigration into the United States. I will also explore the reasons for the control of the Sicilian mafia over other cultures in American urban settings. A main focus will be to examine the integration of culture and ideals of the Italian, more specifically Sicilian, immigrants to the culture that they were entering that was already established in the United States through previous immigration. Through examining patterns of immigration, the urban conditions it created, and the cultural values and perceptions of the Sicilian people, I will prove that the Sicilian Mafia was created as an Italian immigrant self-help organization that was the product of nativism in the United States during the late nineteenth century. The development and definition of a mafia was created as a response to the political persecution they experienced in Sicily from the unified northern Italian government. These influences would ultimately lead to their decision on moving their communities to the United States. However, these communities would experience heavy nativism from established citizens in urban areas.

Presenter: Jared Wolfe
Sponsor: Todd McDorman (Rhetoric)
Title: Women in Baseball History

The idea that baseball has a deeper meaning than just being a game is never directly mentioned in the National Baseball Hall of Fame, but it is definitely understood by how each exhibit connects baseball to American culture. Overall, the Hall of Fame’s “Women in Baseball” exhibit attempts to inspire women to pursue their dreams of success in baseball and American society. One feature in the Hall of Fame’s “Women in Baseball” exhibit is to describe only the positive experiences of women when highlighting their contributions to the game, rather than dwell on the fact that baseball often wanted them out of the front office and off the field. The Hall of Fame also presents baseball as a leader in the development of women’s equality by showing how much they achieved for the game—on and off the field—while also serving as role models for future women. Finally, the exhibit connects the women in the past and their successes in baseball as a way for future women to achieve their own dreams in the game, leaving the door open that maybe one day we may have a woman play in a Major League game.

Presenter: Shane Xuan
Sponsor: Matthew Wells (Political Science)
Title: A Research Agenda on Autocratic Domestic Audience Costs

Scholars of international relations have produced a large literature on the sources and consequences of a state’s intervention in civil wars abroad. Audience costs theory has developed over the years and attributes different domestic reaction toward state’s intervention in the civil wars abroad to regime types, political motivations, or reputation. Kertzer and Brutger (2016) present a modified crisis-bargaining model that challenges Fearon (1994)’s classic one on a definitional level. However, if some autocratic elites can hold their leaders accountable, then to what extent can Kertzer and Brutger’s

study challenge the theory on autocratic audience costs? This paper takes a comparative look at the subnational surveys and newspapers in the United States and China during the Vietnam War, and demonstrates with empirical results that manipulation of media is a potential way to understand the variation and enigma of domestic audience costs. In this regard, this research agenda takes a historical and empirical approach in order to demonstrate that how IR scholars can better understand domestic audience costs from studying audience costs in non-democracies.

Presenter: Shane Xuan
Sponsor: Shamira Gelbman (Political Science)
Title: Why Do Chinese Students Study Abroad: An Empirical Study on “Brain Drain” in Developing States

Why do Chinese students study abroad? Although the potential explanations of emigration are well-documented in previous literature, very few empirical studies systematically explicate the exponentially increasing number of Chinese students studying abroad. My paper addresses this question by using and modifying Truex (2014)’s China Policy Attitudes Survey. I argue that economic and ideological factors, instead of political ones such as grievance toward local government, are the dominating reasons that empirically explain the puzzle such that why so many Chinese students decide to study abroad. I also rely on qualitative survey data and interviews to complement my statistical analysis. The practical implication of my findings is that developing states should employ economic and ideological incentives in order to attract overseas talent.

Presenter: William Yank
Sponsor: Warren Rosenberg (English)
Title: Grand Theft Auto: Masculinity Edition

Grand Theft Auto V is one of the fastest selling video games of all time, with the game making billions of dollars just three nights after its release. This led to my wondering why the game is so popular, especially among men, so I analyzed *Grand Theft Auto V* through the gendered lens of masculinity. I replayed the game myself alongside a female friend in order to comprehend two different portrayals of the game. As we played, I journaled not only my, but her thoughts and feelings as well. I also needed a more scholarly view of the game so I interviewed Professor Michael Abbott, a professor here at Wabash College who enjoys gaming as a hobby. The study revealed that even though *Grand Theft Auto V* constructs a captivating fantasy that exaggerates masculine ideals, the reason we are so attracted to games like *Grand Theft Auto V* is because they give us the sense of ultimate freedom, an addictive storyline, a rewarding experience, and the portrayal of hyper-masculinity. Ultimately, the game shields the player’s view of problems, like misogyny and extreme violence, which are ever apparent in the game.

Presenter: Mason Zurek
Sponsor: Jeffrey Drury (Rhetoric)
Title: Empowering Black Lives Matter through the American Dream

In a March 2015 speech in Selma, Alabama to commemorate the Civil Rights movement, President Obama was confronted with protesters from Black Lives Matter, a group associated with being anti-police and causing riots, who demanded rapid change and black equality on a national level. Black Lives Matter’s connection to violence and unrest made them politically volatile. As a black man and the President, Obama had to delicately balance being the highest authority of law and order in America while sympathizing with Black Lives Matter’s goal of racial equality. In his speech, Obama discusses many of the issues Black Lives Matter is protesting about and, through his rhetoric, supports the movement’s goals without explicitly endorsing the movement itself. By crafting a definition of the American Dream as progressive, Obama empowers Black Lives Matter to pursue their hope of racial equality. Obama utilizes the Civil Rights movement’s credibility to justify his definition of the American Dream, and references Civil Rights’ successful nonviolent protests in order to advocate that Black Lives Matter change their methods and take a more peaceful approach to achieve their goal.

Poster Presentations (Listed by Poster Number)

Poster #1

Presenter: Ian Artis, Jr.
Sponsor: Adriel Trott (Philosophy)
Title: It's Really Not Gay: Racialized Sexuality, Jane Ward, and Sex between Straight White Men

There is an occurrence of straight men having sex with men – straight identifying white men in particular. What these men are doing is not gay; in fact, it is one of the straightest things they could be doing besides sex with women themselves. My poster presentation is not an attempt to prove that these men are closet homosexuals or confused bisexuals. The presentation will draw from, and attempt to affirm, sociologist Jane Ward’s argument in her book *Not Gay* - that not only are these homosocial, sexually fluid acts between straight white men straight, but they actually serve to affirm and strengthen heterosexuality. The purpose of this research is to find the ways in which whiteness/privilege, masculinity, and racialization converge to allow white men to narrate these sexual experiences as “not gay”. How are white men using these themes to have sex with other straight men? What is it about the language surrounding black men/other men of color doing the same thing that criminalizes them, while bolstering and protecting white men? Why and how is this dangerous? My poster will examine these avenues that straight white men are traveling in order to reveal how the current racial power structure in America blends with sexuality. Ultimately, a critical examination of this kind will hopefully be helpful in facilitating a larger discussion on race relations and the language of sexuality in order to topple the hegemonic pyramid that keeps the bodies of men of color policed, monitored, and criminalized.

Poster #2

Presenter: Aaron Becker
Sponsor: Laura Wysocki (Chemistry)
Title: Direct-Current Cardioversion for Patients with Atrial Fibrillation: A 2-year Retrospective Study

Atrial fibrillation (AF) is one of the most common cardiac arrhythmias; over 2 million people in the United States suffer from AF. Direct-current cardioversion (CV) is commonly used to restore patients with AF to normal sinus rhythm. Prior to the procedure the patient must have undergone a transesophageal echocardiogram (TEE) or have been on an anticoagulant (AC) for a minimum of three weeks in order to prevent embolic stroke. Prior to 2009 warfarin was the only available AC. However, since 2009, 3 novel oral anticoagulants (NOACs) have been approved and have begun to be used in place of warfarin. The purpose of this study was to examine the occurrence rate of stroke within 30 days in patients on the NOACs versus those on warfarin. From an ongoing registry of 435 patients, a retrospective analysis was conducted. Each patient underwent a CV at the Parkview Heart Institute (PHI) between May 2013 and May 2015. Multiple data points were collected for each patient, including AC prescribed and the occurrence of stroke within 30 days. Work completed under guidance by Areej F. Sami, BS, Indiana University School of Medicine and William W. Wilson, MD, Parkview Physicians Group- Cardiology-Fort Wayne

Poster #3

Presenter: Allen Betts
Sponsor: Patrick Burton (Biology)
Title: Wnt Gene Expression in Regenerating *Nematostella vectensis* in Alsterpaulone

The sea anemone *Nematostella vectensis* is a species that is capable of complete bidirectional regeneration. The Wnt proteins and their signaling pathway play a key role in regeneration. Alsterpaulone is hypothesized to promote Wnt gene expression in *Nematostella*, causing the animal to develop a second oral region during regeneration. In order to test this hypothesis, regenerating animals were exposed to alsterpaulone, and the morphological effects were observed. We then investigated the expression levels of candidate genes that were previously identified as potential Wnt targets. RNA of the treated organisms was isolated, and this RNA was transcribed into cDNA. Using qPCR, the level of expression of genes was measured in order to determine the effect alsterpaulone had on Wnt gene expression in *Nematostella vectensis*. Most genes exhibited changes in expression consistent with previous experiments.

Poster #4

Presenter: Joshua Bleisch
Sponsor: Shamira Gelbman (Political Science)
Title: Implicit Biases: The Effects of Race, Age, Gender, and Education on Senate Confirmation Times of Federal Judges

In this project I seek to understand the nature of implicit biases on an elite level. I do this by measuring how minority status affects the number of days between the nomination of a candidate for the federal judiciary by the president, and confirmation of that candidate by the US Senate. I use data compiled by the Federal Judicial Center to measure the relationship between race, gender, age, education, and the duration of the confirmation process in days since 1960. I find that non-white and female judicial nominees wait significantly longer for confirmation than do white and male nominees, indicating a more arduous and prolonged process. From this information I conclude that some implicit biases do exist on the part of the Senate toward non-white and female judicial nominees.

Poster #5

Presenter: Brady Boles
Sponsor: Bradley Carlson (Biology)
Title: Home Range Size and Injury Patterns as a Result of Eastern Box Turtle Temperament

Animals often exhibit different behaviors, or temperament, but the causes of this behavioral variation are not fully understood. To explore this, 20 Eastern Box turtles were located over a period of two weeks in Allee Woods forest, which is owned by Wabash College. The turtles were processed and tagged with transmitters. Behavior tests were performed over the next 6 weeks to determine if turtles exhibited specific temperaments. Most turtles demonstrated consistent shy or bold behaviors. The turtle’s injuries were also examined. The plastron and carapace were sectioned into 4 quadrants and were scored based on the number and severity of injuries present. The correlation between turtle personalities and injury scores was evaluated. There was a weak relationship present and the shy turtles had higher injury scores. During the 8 behavior trials, GPS coordinates of turtle captures were recorded. The home ranges of the turtles were obtained to see if there were differences in home range sizes for bold and shy turtles. The home ranges showed that there was no significant relationship between turtle personality and home range size. This study shows that turtles do exhibit varied temperaments and that these variations may play a role in several ecological interactions.

Poster #6

Presenter: Ty Campbell
Sponsor: Agata Szczeszak-Brewer (English)
Title: Can White People be Allies in the War Against Racism?: An Analysis of Plaatje, Gordimer, and Biko

The research I wish to present at the Wabash Celebration of Student Research includes my final paper for ENG-330: Special Topics in South African Literature. The essay, titled “Can White People be Allies in the War Against Racism?: An Analysis of Plaatje, Gordimer, and Biko,” asks how privilege influences race-based inequality and reconciliation. In addition to literary analysis of Plaatje’s and Gordimer’s novels, I offer a case study and information gained from our immersion trip to Johannesburg and Cape Town. A broader picture of the work is used to see race relations in a new light in the United States. The South African based research can be applied to recent demonstrations occurring at the University of Missouri. Why were white allies asked to leave African American healing circles on Mizzou’s campus after Wolfe’s resignation? The answer may hold truth in oppressive history the differences between South African and American post-racial segregation.

Poster #7
Presenter: Zachery Campbell
Sponsor: Heidi Walsh (Biology)
Title: Regulation of Gonadotropin-Releasing Hormone Production by Endoplasmic Reticulum Stress and Kisspeptin: Implications for Obesity and Infertility.

Obesity is a health concern that often leads to increased risk of other ailments such as infertility. Gonadotropin- Releasing Hormone (GnRH) is a protein that is expressed in specific neurons in the hypothalamus and is a key regulator of fertility. GnRH expression is stimulated by the neuropeptide Kisspeptin. The unfolded protein response (UPR) is an adapted mechanism in the Endoplasmic Reticulum (ER) that responds to cellular stressors such as obesity-induced inflammation. We focused on understanding how GnRH neurons and their response to Kisspeptin is impacted by ER stress. Cultured GT1-7 mouse hypothalamus cells were treated with Kisspeptin and the ER stress inducer Tunicamycin to determine the respective interactions between these signals, the UPR, and Gnrh1 gene expression. Quantitative RT-PCR studies confirmed that Tunicamycin adversely affected the production of GnRH, while Kisspeptin increased GnRH production. There also existed an apparent trend for Tunicamycin to increase the expression of the Slc12a2 gene, which encodes a chloride transporter essential for GnRH neuron function. Future work will determine if effects on Slc12a2 are significant and whether ER stress can block the induction of Gnrh1 by Kisspeptin.

Poster #8
Presenters: Cole Chapman & Jacob Alaniz
Sponsor: Lon Porter (Chemistry)
Title: A Simple and Inexpensive 3D Printed Filter Fluorometer Instrument

This goal of this project was to design, prototype, and produce a small and portable analytical instrument using computer-aided design (CAD) modeling and 3D printing. Specifically, a filter fluorometer was fabricated via 3D printing, using polylactic acid (PLA) plastic. These instruments are important for the detection of substances in solution at low concentrations. However, these analytical tools are prohibitively expensive and not very portable. Computer-aided design of a purpose-built filter fluorometer design was accomplished using Autodesk Inventor Professional. Our 3D printed filter fluorometer was modeled to provide a simple and durable design suitable for a variety of laboratory and field applications. Consisting of a simple cross-shaped geometry fused to a circular base for stability, the design is compatible with a wide range of LED source and solid-state detector configurations. The entire kit, including digital multimeter and batteries, can be obtained for less than \$25 from commercial sources.

Poster #9
Presenters: Jonathan Daron & Timothy Riley
Sponsor: James Brown (Physics)
Title: Nuclear Physics: Ultra-High Speed Electronics and Data Structures

In nuclear particle physics it is often necessary to determine the trajectories of a particle so we can locate its source. Using multiple detectors we can take data and trace back the particles trajectories. Our research focused on using ultra-high speed electronics to create coincidence triggering for data collection. We investigated solutions by developing hardware and programming an FPGA. In addition to this, we improved upon existing methods using C++ to merge two separate data files. These files had to take specific elements from their respective data tree structures and combine them to create the new combined desired data tree structure. This data could then be viewed graphically and was sent to colleagues among the MoNA-LISA collaboration for further analysis.

Poster #10
Presenters: Wesley Deutscher, Justin Miller, & Kyle Stucker
Sponsor: Laura Wysocki (Chemistry)
Title: Development of Novel Rhodamine Dyes and Utilizing Computer Modeling as a Means of Predicting Observed Solvent-Dependent Equilibria

Fluorophores are useful molecules that enable probing of particular processes by emitting light. Previous work has shown rhodamine B amide derivatives to be probes for solvent polarity and pH – going from clear colorless solutions in nonpolar or basic conditions to increasingly fluorescent and colored in aqueous or acidic environments. In addition to developing novel synthetic schemes to synthesize a new class of probes, molecules from an existing library were characterized via a solvent polarity assay. The results of these experiments were compared to computer modeling using PC Spartan with the aim of predicting fluorescence behavior to understand trends and allow the rational design of future probes.

Poster #11
Presenter: Darren DeRome
Sponsor: Patrick Burton (Biology)
Title: Cell Proliferation in Regenerating *Nematostella vectensis*

Nematostella vectensis is a species of sea anemone that is capable of sexual and asexual reproduction. Additionally this species is able to fully heal and regenerate damaged or missing structures. The mechanisms by which this regeneration takes place are still being researched. One mechanism that is currently being explored is cell proliferation, or the making of new cells. It has been hypothesized that cell proliferation is necessary for the regeneration of oral structures in this species. The purpose of these experiments was to test initial findings and expand upon this hypothesis by looking for cell proliferation in different experimental settings. The findings of the current research support the hypothesis that cell proliferation is necessary for the formation of primary oral structures and also support the hypothesis that proliferation is necessary for the formation of secondary oral structures as well.

Poster #12
Presenter: Luke Doughty
Sponsor: Bronwen Wickkiser (Classics)
Title: Unmaking Men in Antiquity: Ovid’s *Apollo and Daphne*

The broad goal of this presentation is to show the benefits of reading texts from antiquity in the original Latin, rather than an English translation. Specifically, I will hone in on five lines from the *Apollo and Daphne* episode in Ovid’s epic poem about change, “Metamorphoses.” There are two aspects of Ovid’s writing I want to emphasize. First, I will draw on the work of other scholars to show the work’s context: how Apollo displays impotence as the god of prophecy and poetry (he is unable to predict the outcome of his chase nor is he able to woo Daphne with his words) and the significance of Ovid describing Cupid’s arrows as “gold” and “lead” during a time when those elements had medicinal uses. Second, I will build onto this context with my own analysis of Ovid’s rhetorical strategies, *i.e.*, explain that he composed in dactylic hexameter and used different literary techniques such as chiasmus and anaphora. Together, these two components of the *Apollo and Daphne* episode reveal more than a cat-and-mouse story, but one that lends extra nuance to gender. In a world with controversial gender issues, it may prove insightful to see this story as the Romans did.

Poster #13
Presenter: Nick Etter
Sponsor: Todd McDorman (Rhetoric)
Title: Cooperstown: More than a Field Trip

The Baseball and American Identity Freshman Tutorial class was given the opportunity to travel to Cooperstown, New York, and utilize the National Baseball Hall of Fame for research. The class was given an exclusive behind the scenes look at artifacts, access to the Giammati Research Center, and museum membership. Preceding the trip, our class read scholarly articles about the Hall of Fame, and analyses of the deeper meanings behind some of the exhibits. While at the museum each student did research on an Indiana native Hall of Famer and selected an area of study that corresponded to an exhibit or topic in the museum. I conducted my research on baseball in Latin America, focusing my museum study on the “¡Viva Baseball!” exhibit. I discovered that the Hall of Fame displays mostly information about how Latin America has baseball, but avoided some of the negative effects of introducing baseball into Central America. This leads me to believe that in many cases the Hall of Fame wants to keep the American public uninformed, in an “ignorance is bliss” sort of way, to continue the love of the national pastime.

Poster #14
Presenters: Max Gallivan & Chris Shrack
Sponsor: Laura Wysocki (Chemistry)
Title: Testing Novel Phenolic Fluorophores as Palladium Sensors at Different Concentrations

The goal of this project is to study a novel series of phenolic fluorophores in order see which, if any, are capable of being utilized as palladium sensors. Through a Tsuji-Trost substitution reaction, palladium functions as a catalyst that facilitates the removal of the allyl group from these compounds and produces a fluorescent molecule. The fluorescence signals of these product compounds were measured over 15 minutes using a Carey Eclipse Fluorimeter. We tested these compounds at seven different concentrations of palladium and determined the initial rates of the deallylation reaction, which tells us at what levels of palladium the compound can be distinguished from the blank and be considered an effective indicator. The lower limits of detection amongst these compounds allowed us to determine the effects additional functional groups had on the palladium sensing capabilities of these fluorophores. Palladium is often used in the synthesis of Active Pharmaceutical Ingredients (APIs) though it is often difficult to remove and toxic to ingest. The information here could lead to the development of optimal palladium sensors that could be utilized in quality control of pharmaceutical synthesis in order to ensure that all residual palladium catalyst is removed from APIs.

Poster #15
Presenters: Brian Hayhurst & Mason Keller
Sponsor: Chad Westphal (Mathematics & Computer Science)
Title: Adaptively Weighted Least-Squares for Fluid Dynamics

The problem of modeling fluid flows, especially turbulent flows, necessitates use of numerical methods. The least-squares finite element method is an approximation scheme used to arrive at solutions of systems of equations, such as those that govern fluid flow. Our project focused on a variation of the least-squares method in an attempt to well approximate flows that the standard least-squares method cannot. Specifically, we look at flow over an obstacle and lid-driven cavity flow. Both of these situations induce portions of the solutions to go off to infinity, which makes numerical approximation more difficult. Our variation of least-squares used an adaptive weighting procedure that helps restore accuracy and convergence rates.

Poster #16
Presenters: Abraham Hall, Sam Vaught, & Paul Snyder
Sponsor: Derek Nelson (Religion)
Title: Research and the Wabash Pastoral Leadership Program

Three students who were interns with the Pastoral Leadership Program (supervised by Derek Nelson) propose to present a poster about their shared work with the program, but then also their specific research projects helping Dr. Nelson’s own work. Paul Snyder: For the presentation, I will provide information--books, websites, films, *etc.*--over economics and education, which I researched over the summer for the Pastoral Leadership Committee. I tried to determine what trends in education in Indiana, and also what economic trends and data, would be most necessary for civic-minded pastors in Indiana to know about. I also studied what ethical questions emerged as a result of this research. Abraham Hall: I will be contributing information from my indexing and proof reading three works this summer. I will also contribute by showing some of the research I did for Dr. Nelson in regard to the Oxford Encyclopedia of Martin Luther. Samuel Vaught: My contribution will be a look into the process of researching for Dr. Nelson’s revision of Bill Placher’s *Readings in the History of Christianity, Part II*. The information will highlight looking at the current sweep of contemporary theologians, how they are represented in similar literature, and then what it was like to give Dr. Nelson recommendations on what to include in his volume. Additionally, I continue to support the project by serving as a go-between with Dr. Nelson and the publishers of the many documents in the volume.

Poster #17
Presenter: Free Kashon
Sponsor: Amanda Ingram (Biology)
Title: Coevolved Species in a Non-Native World

There are many invasive species that are found throughout the US, and the Chesapeake Bay is no exception. In fact, there are sympatric species of Japanese coevolved plants and herbivores that have arrived on the shores of the bay in the last century. Both herbivores were introduced in the 1910s and attempts have been made to keep these animals under control. The Sika Deer remain mostly on the eastern shore of the Chesapeake Bay, while the beetles have spread across the country, becoming a common garden nuisance. During the summer of 2015, Dr. John Parker’s lab, located at the Smithsonian Environmental Research Center, conducted research to determine the feeding preferences of these animals. The goal was to determine whether the invasive herbivores preferred to consume native (novel) or Japanese invasive (coevolved) species. This was conducted through the usage of cafeteria style feeding assays utilizing 13 invasive and 12 native species, located in the lab and the western shore, for beetles and deer, respectively. Data indicated that the deer preferred native species, while the beetles showed no significant preference. This has further implications for the control of these species and any possible action wildlife managers may take in the future.

Poster #18
Presenters: Inbum Lee & Tianhao Yang
Sponsor: Martin Madsen (Physics)
Title: Magnetic Field of Superconducting Loops

In this experiment, we attempted to create a closed superconducting loop. Two designs of the loop were tested. One was created by splitting the middle part of a strip of HTS thin film conductor and opening up the hole. The other one was by taping the two ends of another HTS strip. We tested them by measuring the axial magnetic field produced the two loops. We expected to obtain a magnetic field close to that of a magnetic dipole, and the data show that the magnetic field of our split loop agrees with the expectation. Hence we produced a closed loop.

Poster #19

Presenter: Noah Levi
Sponsor: Heidi Walsh (Biology)
Title: Understanding the Link between Fertility-Related Gene Expression and Obesity through the Unfolded Protein Response

GnRH, Gonadotropin-Releasing Hormone, is the primary signal for reproduction. The Gnrh1 gene is expressed in specific hypothalamic neurons, and dysfunction of these cells can cause infertility. In obesity, inflammation and endoplasmic reticulum (ER) stress can create a vicious cycle of cellular stress in the brain. To determine how GnRH neurons are affected by stress signals, we measured transcriptional responses to tunicamycin (an ER stress inducer) in GT1-7 cells. The ER synthesizes membrane and secretory proteins, and protein misfolding in this organelle triggers the unfolded protein response (UPR). The UPR activates a specific transcriptional program that may either help cells adapt to protein misfolding or trigger apoptosis. In GT1-7 cells, Gnrh1 transcription decreased when cells were exposed to ER stress. We also observed that expression of two transcription factors (c-fos and Cebpb), known to repress Gnrh1 expression in response to other stimuli, was upregulated by tunicamycin. To better understand the pathway from ER stress to Gnrh1 repression, protein kinase C signaling was inhibited during ER stress; however, only c-fos expression was responsive to PKC inhibition. Future work will further probe the role of PKC and the transcription factor NF-kB, which is also reported to regulate Gnrh1 through c-fos.

Poster #20

Presenters: Cordell Lewis, Karl Prasher, & Bryan Tippmann
Sponsor: Martin Madsen (Physics)
Title: Towards the Detection of La Ions via the Optogalvanic Effect

The optogalvanic effect, by which we can observe the atomic spectra of species, has been used to detect ions in Zr as well as among others. We wished to first establish a basis of how to detect spectra using a hollow cathode tube filled with a Lanthanum-doped Neon gas and a He-Ne laser producing a max power of around 30 mW. We found that the location with the largest optogalvanic (OG) signal is directly in the middle of the hollow cathode. We determined a linear relationship between laser intensity and the signal as well as a similar relationship with the voltage applied to the cathode.

Poster #21

Presenters: Charles Mettler & Luke Gunderman
Sponsor: Amanda Ingram (Biology)
Title: Indiana Orchids and their Mycorrhizae

Indiana is home to more than 40 species of orchids, many of which are threatened due to habitat degradation. A distinctive aspect of orchid biology is that these plants depend on mycorrhizae, mutualistic associations between fungi and plant roots, in order to complete their life cycle, in part because orchid seeds lack a nutrient source to support early growth in seedlings. However, the identity of the fungal partner is not known for most Indiana orchids, and the extent to which the relationship persists through the life cycle is unknown. It is therefore crucial to better characterize orchid mycorrhizae to support conservation efforts for these charismatic plants. In this experiment, orchid roots were sampled from three native orchids (*Platanthera ciliaris*, *P. psycodes*, and *P. peramoena*), and the roots were characterized for morphology and for peloton (small bundles of fungal tissue) abundance. These two measures were cross-referenced, and the results show that greater color is correlated with a higher peloton density. Also, an attempt at characterizing the fungal species present was made: two of the most common orchid mycorrhizal fungal genera, *Tulasnella* and *Ceratobasidium*, were found from samples of fungal culture grown from the root samples.

Poster #22

Presenter: Immanuel Mitchell-Sodipe
Sponsor: Agata Szczeszak-Brewer (English)
Title: On the Lack of Space for Women in Black Analytical Frameworks and Liberation Politics

Amongst the numerous supporting claims I make in my paper, there are perhaps two that are the most significant: Black-consciousness cannot liberate women; W.E.B DuBois does a lot better; and there is significant room for improvement. More specifically, when it comes to Black analytic frameworks and liberation politics, Steve Biko (South Africa) and W.E.B DuBois (United States) seem to stand out the most. Biko’s Black-consciousness is liberation politic -- one that cannot liberate women because it does not center them. But Biko’s politic is abolitionist but not praxis. DuBois’ analytical framework does provide a space for women, and as liberation politic, is abolitionist as well. It is also praxis politic Bessie Head’s (South-Africa) liberation politic centers on women and is praxis, but is not abolitionist. At the end of my paper, I call for an analytical framework that provides a space for women and also manifests as a liberation politic that is abolitionist praxis.

Poster #23

Presenter: Eric Need
Sponsor: Dennis Krause (Physics)
Title: Placing Limits on New Forces from the Decca Experiment

Of the four fundamental forces, gravity, the oldest known, is the least understood. There is no description of the gravitational force at atomic and smaller scales due to its relative weakness. This past summer I worked with Dr. Krause to develop limits for potential new forces based off of an experiment by Ricardo Decca at IUPUI. We focused on forces that would act like a correction to the Newtonian Gravitational Law when looking at very small distance scales. By considering the compositions of different atoms, we were able to place new limits on such forces, which may exist on these scales.

Poster #24

Presenters: Jake Norley & Connor Smith
Sponsor: Kevin Meyer (Perfinity Biosciences)
Title: Development of an Optimized Trypsin Digestion System

This research focused on developing an optimized trypsin digestion reactor system to enable the analysis of difficult to digest, yet clinically relevant biomarkers by LC/MS/MS instrumentation. The newly synthesized reagents bring reaction times down to 5-15 minutes, a significant improvement over what have historically been 18-48 hour reaction times while. Furthermore, using the newly synthesized reagents enables a much more complete digestion and therefore more accurate results. Activity assays were performed by means of digesting representative proteins then measuring reaction progression using a quantitative LC-UV method. The application of the optimized reactor was proven by means of digesting thyroglobulin, analyzing the reaction progression using LC/MS/MS and comparing results to published methods. Published methods for this protein involve 4 steps, and take over 24 hours. The multistep nature of this historical process made it prone to error while the time requirement created a significant burden to patients as well as clinicians. The simplified process using the optimized reactor is performed in 1 step and 15 minutes. These developments can greatly impact the field by enabling more accurate findings and rapid results.

Poster #25

Presenter: Adam Rains
Sponsor: Neil Schmitzer-Torbert (Psychology)
Title: Trait Mindfulness is not associated with the Greater use of Hippocampally-Dependent Navigation Strategies

Mindfulness training (mindfulness-based stress reduction, MBSR) has been found to be effective in reducing stress and improving cognitive function, and to produce changes in regional grey matter density in brain areas including the hippocampus. Based on this work, we investigated if dispositional mindfulness was associated with the use of hippocampally-dependent navigation strategies using a set of virtual navigation tasks. Participants (n=111) were recruited through Amazon’s Mechanical Turk service after completing the Cognitive and Affective Mindfulness Scale-Revised (CMS-R). Participants completed up to four navigation tasks: the 4 on 8 virtual maze (Iaria, Petrides, Dagher, Pike, & Bohbot, 2003), the Concurrent Spatial Discrimination Task (CSDLT, Etchamendy, Konishi, Pike, Marighetto. & Bohbot, 2012), a wayfinding task set in a virtual town and a virtual water maze. While the results from the behavioral tasks fit our expectations based on previous research (performance on the wayfinding and water maze task was strongly related, and flexible performance on the CSDLT was associated with better performance on the wayfinding and water maze task), we found no association between mindfulness scores (on the CMS-R) and any of the navigation measures. These data suggest that while dispositional mindfulness may be associated with hippocampal volume, trait mindfulness does not appear to be strongly related to measures of hippocampally-dependent navigation strategies.

Poster #26

Presenter: Timothy Riley
Sponsor: Martin Madsen (Physics)
Title: Simulating Bacteria Movement Through Micro-robotics

In micro-robotics, we often want to simulate natural processes to gain a better understanding of how they work. My researched focused on using vibrating motors controlled by a microprocessor attached to a 3D printed base to simulate the “Run and Tumble” movement associated with bacteria. I investigated solutions by developing different base structure formation and the corresponding code for each.

Poster #27

Presenter: Jared Santana
Sponsor: Heidi Walsh (Biology)
Title: The Role of JNK Signaling in ER Stress-Induced Inflammation in Gonadotropin-Releasing Hormone Neurons

Obesity is characterized as a chronic state of inflammation, and in the brain, obesity-induced inflammation can cause endoplasmic reticulum (ER) stress. Activation of the kinase JNK and transcription factor NF-kB in the brain leads to the transcription of pro-inflammatory cytokines, which exacerbates ER stress and cellular dysfunction. The cellular pathways activated by ER stress, known as the unfolded protein response (UPR), may signal for inhibition of protein synthesis, apoptosis, and/or further pro-inflammatory cytokine gene transcription. Inflammation in Gonadotropin-Releasing Hormone (GnRH) neurons reduces GnRH output, and significant decline in GnRH levels can lead to infertility in animals and people. It is unknown, however, how ER stress impacts cytokine and GnRH production. Using the GnRH-producing cell line GT1-7 as a model, we observed a reduction in Gnrh1 gene expression after ER stress, but an increase in expression of the pro-inflammatory cytokine gene Il6. ER stress also promoted JNK, but not NF-kB phosphorylation, suggesting that JNK signaling may act independently of NF-kB to regulate gene expression in these cells. Future work using chemical inhibitors of JNK will determine if JNK activity is required for ER stress regulation of Gnrh1 and Il6 transcription.

Poster #28

Presenter: Cameron Stepler
Sponsor: Laura Wysocki (Chemistry)
Title: Synthesis of Effective Water-Soluble Fluorescein Dibenzyl Ether Cytochrome P450 Substrates

Cytochrome P450 is a key family of enzymes in the breakdown of drugs and toxins in the body. We are interested in probing the activity of these enzymes with different organic ethers through a library of fluorescein diether derivatives. These compounds are hydrolytically stable and exhibit very low background fluorescence before unmasking with high contrast, making them ideal targets for sensitive assays. The first-generation library revealed challenges related to solubility of the fluorogenic compounds in the desired assay. Through the design and synthesis of a variety of substrates, progress was made toward water-soluble probes that display reasonable kinetics for evaluation and investigation of enzymatic activity.

Poster #29

Presenters: Benamin Washer & Mazin Hakim
Sponsor: Lon Porter (Chemistry)
Title: Developing Scientific Instrumentation using Digital Design and 3D Printing

We report the computer-aided design (CAD) and fabrication of a 3D printed colorimeter for use at all levels of the curriculum. The model described here is simple, flexible in design, printed quickly, and consumes less than a dollar’s worth of printing material. Digital designs were constructed using simple CAD programs, such as Tinkercad and Inventor Professional, commonly available to students and educators. Colorimeters were successfully fabricated from digital files using a variety of consumer-level 3D printers. Plastic cuvettes, LED source, silicon phototransistor, and 9V batteries complete the inexpensive colorimeter kit. Instruments are quickly and easily assembled by students for use in a variety of laboratory activities, where transmittance and absorbance values are calculated via voltage measurements using a digital multimeter. The 3D printed colorimeter performs well when compared to commercially available spectrophotometers and the digital design is easily modified in order to explore a variety of concepts inaccessible to more conventional instruments.

Poster #30

Presenter: Korbin West
Sponsor: Walter Novak (Chemistry)
Title: Ramachandran Outliers in Ligand-Induced Protein Structural Changes

Ramachandran outliers are amino acid residues that have unfavorable dihedral angles proteins. Often found in protein structure analysis, the presence of these outliers may be simply errors in the structure; however, other times these outliers existence is supported by structural data. There has been little investigation into the role that these energetically unfavorable outliers have in protein structure. Of special interest is how ligand binding may affect protein structures with respect to Ramachandran outliers. These structural changes may drastically alter the properties of proteins: ligand affinities, protein-protein interactions, or activity levels. In this study, we survey the Ramachandran outliers in pairs of proteins in the ligand-bound and unliganded states available in the Protein Structural Change Database (<http://idp1.force.cs.is.nagoya-u.ac.jp/pscdb/>). We also examine whether these outliers are supported by the structural data using PDB_REDO (http://xtal.nki.nl/PDB_REDO/). This research is supported by the Wabash College Haines Biochemistry Fund.

Poster #31

Presenter: Aaron Wirthwein
Sponsor: Dennis Krause (Physics)
Title: Optimizing Interactions in Quantum Plasmonics

Quantum information science involves studying quantum mechanical properties of matter and their viability as conduits of quantum information. Photons, for instance, have exploitable properties such as polarization and frequency, and their weakly interacting nature makes them ideal information carriers. However, efficient manipulation of photonic properties requires strong coupling of light to matter. Strong coupling to nanoscale emitters has been achieved with localized surface plasmons (LSP's) in optically excited metallic nanostructures. LSP's typically experience high decay rates, so we decided to investigate conditions that would minimize thermal and radiative dissipation while preserving their interaction enhancing effects. Computational and spectroscopic techniques were employed to determine optimal geometries for triangle nano-hole arrays and incident polarization angles for optical excitation. Optimized plasmonic systems should enable highly-efficient generation and communication of photonic information. Future work will focus on observing strong coupling at the single-emitter scale with profound implications for quantum-controlled devices such as single-photon sources and transistors.

Poster #32

Presenter: Yang Yang
Sponsor: Martin Madsen (Physics)
Title: Towards Generation of Continuous-Variable Cluster-State

Cluster states are highly scalable resources for one-way quantum computing, and can be generated from entangled pairs of light modes. In our experiment we are trying to generate continuous-variable cluster state via entangling spatial modes of the light field at a low cost with tapered amplifiers as gain medium. We adapt the four-wave mixing process as our method to generate entangled light modes. The disadvantage of tapered amplifier is its excess noise produced by spontaneous emission. This noise will easily contaminate the entanglement. Thus, we have to investigate how the combination of original laser power and amplified laser power affects entanglement quality before we generate the multiple spatial modes to demonstrate cluster states. With the maximum laser power, the ultimate goal is to design and realize the experiment to generate cluster states with four available entangled modes.

