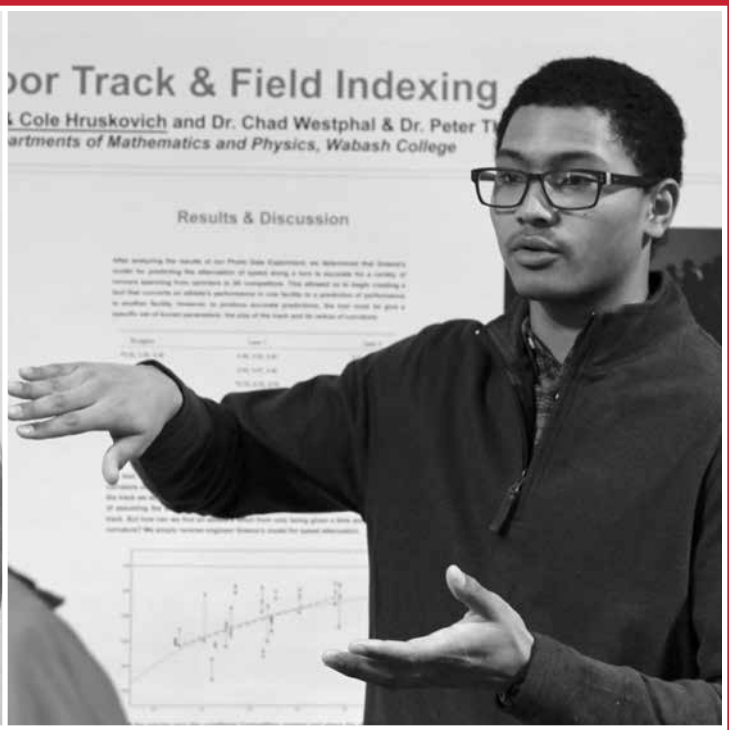

Wabash College

15th Annual Celebration of Student Research, Scholarship, and Creative Work

Friday, January 23, 2015 • Detchon Center

Welcome and Introduction

Welcome to the 15th Annual Celebration of Student Research, Scholarship, and Creative Work at Wabash College. For the past 14 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, Shamira Gelbman, Amanda Ingram, and Colin McKinney. Adam Bowen and his students contributed to the poster production, as have other Media Center and IT Services staff; Kim Johnson formatted and prepared the program for printing; Campus Services, Kecia Tatman, Mary Jo Johnston, and the 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 3:40 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 22.

Schedule of Oral Presentations by Time Slot and Location

Detchon 111

1:10	David Gunderman	Gerrymandering: The destruction of democracy
1:30	Shane Xuan	(Anti-)Theory of human rights: Distributive justice
1:50	Tanner Watson	Foucault and Agamben: How the State became racist
2:10	Yunan Wu	How do children learn to access the unsaid?
2:40	Ryan Horner	*It Came Under Some Duress*: A short story
3:00	Kevin Kennedy	Essentialism in Wole Soyinka's *The Lion and the Jewel*
3:20	Tim Hanson	Narrating conditions
3:40	Jocelyn Hopkinson	Marshall Mathers (Eminem): Masculinity manifested

Detchon 112

1:10	Macallister Norton & Adam Burtner	Planning and analyzing a public deliberation event
1:30	Brian Gregory, Dykan Seikel, Ezequiel Godinez, Shane Beaman, & Austyn Belden	Gentlemen and citizens
1:50	Anthony Douglas II & Justin Green	Analysis and critiques of Montgomery County Tea Party social movement organization
2:10	Bilal Jawed, Daniel Purvlicis, Nelson Novack, & Uziel Rivera	Analysis of a social movement organization (SMO): Friends of Sugar Creek (FOSC)
2:40	Derek Andre	Assessing deliberative pedagogy: Using a learning outcomes rubric to assess tradeoffs and tensions
3:00	Adam Burtner & Terry Majors	Spheres of argument in climate change deliberations in an undergraduate biology classroom
3:20	Patrick Bryant	The Election of 1896: Bryan's whistle-stop and McKinley's front porch
3:40	Andrew Powell	Senate candidates on Twitter

Detchon 209

1:10	Joe Mount	*I, Nephi: A Gay Mormon's Survival Guide*: Presentation on process
1:30	Patrick Kvachkoff	Building a character: A deconstruction of Nathan Detroit
1:50	AJ Akinribade	The emerging young black man in their office: Our motivations and expectations
2:10	Corey Egler	The rising action: Theatre marketing and survival in a moderately sized city
2:40	Cody Cochran	The art of the dystopia
3:00	Logan Taylor	You are not a hero: An ideological analysis of *Spec Ops: The Line*
3:20	Matt Clark	Materialism and moralism in Johnny Cash's *Hurt* music video
3:40	Nathan Bode	The American abyss: Dionysian themes in 21st Century film and music

Detchon 211

1:10	Wes Hauser	My Alaskan summer as an orchid and watershed researcher
1:30	Cameron Dennis	Negative refraction in meta-strings and meta-membranes
1:50	Aaron Wirthwein	String theory: Making string analogs of optical interferometers
2:10	Max Millott	Summer REU at Purdue: High temperature superconductivity
2:40	Cameron Brown & Chris Shrack	Substrate specificity of acetate kinase in *Francisella tularensis*
3:00	Lu Hong	Changes in retinal-opsin interactions during the rhodopsin photocycle
3:20	Ivan Koutsopatriy	Exploring the PI3K signaling pathway
3:40	Albert Li	Methods for finding the nullspace of sparse matrices in Linbox
4:00	David Gunderman	Hölder estimates for Cauchy-type integrals

Detchon 212

1:10	Carter Adams	Income inequality in Latin America, Eastern Europe, and the 2008 global crisis: An order probit analysis
1:30	Grant Klembara	Metaphors and storytelling in economic discourse: Exploring the implications of Warren Buffett's inventive rhetoric
1:50	Clayton Lengerich & Eddie Pingel	The differing worldviews of Flavius Agricola and Flavia Primitiva: An analysis of their thoughts on life and the afterlife
2:10	Kyle Schwab	Internment in the United States during World War II: Lies, realities, and the struggle for representation
2:40	Reece Lefever	What does a manly man eat?: McDonald's regionalization in today's China
3:00	Xinyu Ma	Globalization 101: Understanding KFC's business success in China
3:20	Conner Lefever	Wrestling in China: A comparative study of the localization of Coca-Cola and PepsiCo, 2008
3:40	Tyler Trepton & Connor Karns	Marketing and promotional campaigns of McDonald's in China from 2008 to 2014

Detchon 220

1:10	Emiliano Aguilar	The expression of a unique cultural identity through musical tradition: Chicano music across time
1:30	Patrick Jones	How the García Girls lost their accents: A look at the literature about Latin American acculturation in the United States
1:50	Tyler Munjas	The theme of death in Quiroga's short stories
2:10	Erik Kile	Antisemitism in Wagnerian Opera
2:40	Ethan Buresh	Native American *pow-wows*
3:00	Zack King	*Gagaku*: The genre of Japanese courtship tradition
3:20	Patrick Kroll	Hindustani music: The analysis of its contextual functions
3:40	Douglas Rourke	The *kora* harp lute: Its sacred tradition and music among the Mande people
4:00	Alejandro Reyna	The cultural importance of *Mariachi* music

Schedule of Poster Presentations and Exhibits

Session 1 — 1:00 p.m. to 2:30 p.m.

No	Presenters	Title
1	Bradon Badger, Eric Need, & Kelly Sullivan	Always on target
3	Adam Boehm, Daniel Bowes, Keaton Holsinger, Chris Stazinski, Chase Young, Niki Kazahaya, & Adam Rains	Differences in brain activations during memory: Guided and GPS-guided wayfinding in a virtual city
5	Nicholas Boyce	Impacts of pawpaw on photosynthetic photon flux available to tree seedlings
7	Jacob Burnett	Specialists in violence: How individual backgrounds of African leaders affect development
9	Colin Downey	Non-cardinal color mechanisms: Stimulus size matters
11	Travis Flock	Tracking blue catfish movement in Chesapeake Bay using acoustic telemetry
13	Michael Haffner & Brandon Wongngamnit	AHL expression in marine bacteria
15	Tim Hanson	South Africa: Where are we now?
17	Lu Hong	Assessing navigation performance in virtual environments on mobile devices
19	David Lawhorn & Chris Rai	On trigonometric functions and matrices
21	Christopher McGue	Worms in snails: The influence of habitat and distribution in two host species in Sugar Creek
23	Billy McManus	The role of senescence-associated factor IL-6 in tumor cell recruitment to the bone stroma
25	Anthony Milto & Jake Norley	Improving the efficiency of fluorescein diether cytochrome P450 substrates
27	Mason Zurek	Comedy and tragedy in fraternities

Schedule of Poster Presentations and Exhibits

Session 2 — 2:30 p.m. to 4:00 p.m.

No	Presenter	Title
2	Keaton Holsinger	What's the buzz about pollinator efficiency?
4	Bilal Jawed	Disease vectors of Montgomery County: The mosquito
6	Joe Mount & Stephen Batchelder	Wabash Pastoral Leadership Program: Summer internship experience
8	Max Nguyen, Joe Sukup, & Kevin Wynder	¡Revolución!
10	Aren Peterson	Epilepsy treatments in *Danio rerio*
12	Josh Santana & Justin Miller	Designing an efficient and practical polarity assay for xanthene dyes
14	Jingwei Song	Microsatellite analyses of tautog, *Tautoga onitis*, population structure off the Atlantic Coast
16	Kyle Stucker	The stories and messages of the Library of Congress
18	Xidian Sun & Chris Rai	An adaptively weighted least-squares finite element method for elliptic problems with singularities
20	Benjamin Washer, Campbell Higbie, & Matthew Bupp	Initial studies of metal ion extraction using porous silicon
22	Alex Waters	The influence of the extracellular matrix on tendon cell regeneration
24	Korbin West	Variation of trypsin digestion
26	Yang Yang	Anomalous motion of trapped ion microspheres
28	Mason Zurek	Community or Catholicism: Georgetown's response to the contraception controversy

Oral Presentations (Alphabetical by Presenter)

Presenter: Carter Adams
Sponsor: Peter Mikek (Economics)
Title: Income inequality in Latin America, Eastern Europe, and the 2008 global crisis: An order probit analysis

Using an ordered probit model, this study examines the factors that influence income inequality levels in Latin American and Eastern European countries. We expand upon previous research by shifting the focus onto the effects of the recent global financial and economic crisis on income inequality. The results suggest the crisis increased inequality in countries overall. However, those countries with low levels of inequality saw their Gini coefficients decrease, while the crisis increased inequality in countries with already high inequality. Additionally, this study finds European Union membership actually increases inequality in countries with low Gini coefficients and that FDI has no impact on inequality.

Presenter: Emiliano Aguilar
Sponsor: Aminta Perez (History)
Title: The expression of a unique cultural identity through musical tradition: Chicano music across time

Throughout the course of Mexican-American history, their struggle for empowerment has created conflict between the ever-growing ethnic group and the Anglo majority. However, this tension remains a central struggle for Mexican-American empowerment and socio-economic progress. This paper will explore four central periods in history: Post-Mexican-American War Period (1860-1910), the Mexican-American Generation, the Chicano Movement (1960s-1970s) and lastly the Post-Chicano Movement (1980 to present). An extensive collection of songs creates a plentiful primary source foundation, from border *corridos*, *movimiento* music, *huegla* songs, and mainstream hip-hop music. Concepts that are explored include the cultural identity, social class divisions, and struggle in opposition to Anglo culture. Through examining these songs, I will argue that the constant adaptations made to the music of this community moved to the mainstream attention of a wider audience from its isolation in self, or the Mexican-American community. Pre-Revolutionary Period and Chicano Movement music each tried to raise awareness of the second-class citizenship Mexican-Americans faced, but the move to a mainstream music, such as hip-hop, allowed for Chicana/o communities to widen their audience from their own community. Central to this paper is the resurgence of the "social bandit" in modernity to serve as a symbol of resistance against oppression.

Presenter: AJ Akinribade
Sponsor: Dwight Watson & Jessie Mills (Theater)
Title: The emerging young black man in their office: Our motivations and expectations

The purpose of this project is to explain how impactful educational theatre can really be. I use the concept of the emerging young black man in the office to illustrate this point. By delivering a performance, moderating a discussion, and giving the audience a specific role to play, I believe that this type of theatre, educational theatre, creates a very inclusive atmosphere where an individual can reflect and discuss hypotheses. Educational theatre can provoke a (sometimes very much needed) healthy conversation. It's an exchange of ideas. I dive into the thoughts of young educated black men like myself who are entering the office space environment. What drives us? How do we expect to be treated? Does skin color play a role in how we navigate our professional relationships? My study researches these questions and others like them. A focus group of African-American Wabash students with previous work/internship experience was also formed to gain specific perspectives on the topic. Some of the most compelling findings from the study are that the emerging young black man expects to be treated with a mutual level of respect and understanding in the workplace and he will not let his skin color limit him. My wish is that people absorb my illustration and use it as a reference to become more aware of situations in the office space environment where someone may feel "othered."

Presenter: Derek Andre
Sponsor: Sara Drury (Rhetoric)
Title: Assessing deliberative pedagogy: Using a learning outcomes rubric to assess tradeoffs and tensions

Teaching deliberative decision-making is a method of encouraging students to think critically, engage public problems, and engage in both public speaking and public listening. College instructors have begun to use deliberation as a pedagogical tool, yet further research is needed to understand the learning outcomes of deliberative pedagogy. This pilot study argues that the deliberative principle of "understanding tradeoffs and tensions" is a key learning outcome of deliberative pedagogy. To evaluate this principles, we employ a critical-interpretative method—applied rhetorical criticism—to four focus group deliberations to assess how students learned the deliberative principle of "understanding tradeoffs and tensions" in public problem solving. The analysis of this pilot study suggests that students with previous training in deliberation exhibited a more deliberative process of public problem solving and reached higher levels of understanding and articulating the tradeoffs and tensions in the deliberation. The results also demonstrate the need for more development and assessment of the learning outcomes of deliberation.

Presenter: Nathan Bode
Sponsor: Alexandra Hoerl (Political Science)
Title: The American abyss: Dionysian themes in 21st Century film and music

This presentation will offer explorations of two examples of film and music from the first decade of the 21st century using Friedrich Nietzsche's concept of the synthesis of the Dionysian and Apollinian from *Birth of Tragedy*. I first examine the combination of perfect structure and dark intoxication within Darren Aronofsky's 2010 thriller *Black Swan*, including the examination of visual and cinematic dichotomies within the film. I then offer an analysis of Lady Gaga's 2009 album *The Fame Monster* identifying themes of intoxication, lies, violence, and sexuality within the work. In an exploration of significant historic events in American history leading up to the release of both *The Fame Monster* and *Black Swan*, including the Abu Ghraib prison scandal and the botched federal response to Hurricane Katrina, I suggest that a changing American identity and a crumbling of the relationship between the American people and its government has led to an embrace, rather than rejection, of these dark, impulsive themes.

Presenters: Cameron Brown & Chris Shrack
Sponsor: Walter Novak (Chemistry)
Title: Substrate specificity of acetate kinase in *Francisella tularensis*

Francisella tularensis is a virulent strand of bacteria that causes tularemia and can be easily made into an aerosol. Due to this, the purpose of this research is to mutate various amino acid residues in the binding site of the acetate kinase protein in *Francisella tularensis*, as this protein is pivotal in the catalytic synthesis of acetyl phosphate from ATP. The summer research was dedicated to creating successful mutants using Q5 site-directed mutagenesis protocol. The most successful mutants created were substitutions for the alanine 173 in the active site. This amino acid residue was successfully replaced with phenylalanine, leucine, and valine. However, kinetic assays were not run on the mutants to determine the effect of the mutation on the activity of the acetate kinase. This is because the final few weeks of research were dedicated to finding a way to successfully crystalize the mutated protein. This leads to possible future research, as kinetic assays need to be run in order to determine the effects of the mutations on the acetate kinase and it would be beneficial to crystalize the protein as well in order to perform X-ray crystallography.

Presenter: Patrick Bryant
Sponsor: Sara Drury (Rhetoric)
Title: The Election of 1896: Bryan's whistle-stop and McKinley's front porch

The election of 1896 was a novel one in which candidates William McKinley and William Jennings Bryan engaged in a fierce ideological battle on a money valuation question. McKinley represented industry and the wealthy of the east while Bryan championed the cause of the farmer and westerner, spawning populist politics. Off the heels of financial depression in the early 1890s, the Bryan camp favored money valued by both gold and silver whereas the wealthy eastern industrialists, often creditors to the western farmer, preferred the status quo Gold standard. Bryan, the progressive, measured his efforts' success in miles traveled and hours speaking. He was the outsider, speaking to and attempting to mobilize an electorate that historically was overshadowed by machine politics of the east. McKinley took a different approach, staying at home on his front porch, and spoke to his visitors with the national newspaper audience in mind more than anything. The rhetorical nature of the two candidates' campaigns proved to be not only symbolic of their respective policy positions, but demonstrate distinctive parts of a hybrid model of political campaigning that is common to contemporary campaigns.

Presenter: Ethan Buresh
Sponsor: James Makubuya (Music)
Title: Native American *pow-wows*

My presentation discussion will focus on Native Americans, looking specifically at the significance of *pow-wows* in their cultures. Starting by briefly describing what *pow-wows* are and explaining how they came to be about, I will go back to the origins of where *pow-wows* first came from. My presentation will then move on to the identification of the instruments most commonly used in the *pow-wow* performances and how they help to run the events smoothly. In addition, I will discuss how the said instruments are made, getting into some detail regarding the construction materials, where they are from, and what part of the country uses different variations of the said instruments. The presentation will then move on to describe the *pow-wow* dress attires or outfits that are worn by the performers and why the latter wear such costumes during the performances. In this presentation, I will use both audio and video clips as well as picture images to illustrate all points being discussed as one way of sharing what my research revealed to me about the contextual significance of *pow-wows* in the Native American cultures.

Presenters: Adam Burtner & Terry Majors
Sponsor: Sara Drury (Rhetoric)
Title: Spheres of argument in climate change deliberations in an undergraduate biology classroom

Using Goodnight's theory of argument spheres, we analyze how student participants used personal, technical, and public argumentation in a deliberation over climate change in an undergraduate biology classroom. Our analysis suggests that taking coursework in biology did not move participants away from egocentric argumentation previously found in other deliberation events. However, we demonstrate that participants' technical training and reasoning may aid the weighing of tradeoffs and tensions in democratic deliberation. This essay thus suggests the importance of citizen education beyond the civics classroom and suggests future opportunities and challenges for public deliberation.

Presenter: Matt Clark
Sponsor: Jennifer Abbott (Rhetoric)
Title: Materialism and moralism in Johnny Cash's *Hurt* music video

In 2002, Johnny Cash released a cover of the Nine Inch Nails song *Hurt*. Using my own explanatory schema drawing primarily from metaphoric and mythic criticism, I have analyzed the music video that was released the following year to show the ways it examines the materialistic facet of the "American Dream" myth, using Cash's life as a case study and ultimately subverting this myth. Instead, the video positions moralism, the other major facet of the "American Dream" according to Walter Fisher, as the preferred route to happiness and satisfaction in life. The video's excellent artistry directly contributed to a very emotional, visceral reaction to the video by many of its viewers.

Presenter: Cody Cochran
Sponsor: Michael Abbott (Theater)
Title: The art of the dystopia

My research paper analyzes depictions of dystopia in science fiction across various media. Specifically, I examine Fritz Lang's *Metropolis*, the novel *Atlas Shrugged* by Ayn Rand, and the video game *Bioshock* written by Ken Levine and developed by 2K games. These three works are among the best and most famous depictions of science fiction dystopia in their respective fields. I analyze each to reveal the elements that convey a sense of the dystopia to its audience. Moreover, I claim that *Bioshock* delivers a more powerful experience of dystopia than *Metropolis* or *Atlas Shrugged*. This is achieved through a level of interactivity and personalization which allows the player to experience a greater level of depth than either of the other two works. Also, a great deal of background information about the world in *Bioshock* may be revealed to the player who chooses to discover it, which is different from the other two works.

Presenter: Cameron Dennis
Sponsor: Dennis Krause (Physics)
Title: Negative refraction in meta-strings and meta-membranes

In Physics 112, students learn about Snell's Law which tells us that different materials bend light according to their indices of refraction. We only discuss positive indices of refraction because they correspond to waves that travel in the same direction as the energy flow. However, recent research has shown that it is possible to construct a "metamaterial" which has a negative index of refraction. Much of the research in this field deals with optical and acoustic media, but our aim was to find the basic ingredients necessary to design simple strings and membranes that would display this property. It turns out that a material with a negative mass and tension is necessary, but unfortunately they don't exist naturally. Using previous research, we sidestep this issue and achieve our goal by designing meta-strings and meta-membranes. All of these concepts seem very abstract and mysterious, but a multitude of visuals will be utilized to make them clear.

Presenters: Anthony Douglas II & Justin Green
Sponsor: Jeffrey Drury (Rhetoric) & Shamira Gelbman (Political Science)
Title: Analysis and critiques of Montgomery County Tea Party social movement organization

After a semester of learning about the history, functioning, and facets of social movements under Dr. Shamira Gelbman and Dr. Jeff Drury, we (along with Adam Burtner) applied this knowledge to the Montgomery County Tea Party (MCTP), a local political social movement organization based in Crawfordsville, IN. We spent a semester studying this movement, from the structure of the organization, to its involvement in the community, all the way to its use of social media. Our methods of study included interviews with leadership in the movement, attending MCTP meetings, and observing activity on social media pages such as Facebook and their website. As a result of this intensive studying, we used the material from class to offer constructive criticism on how the movement could increase youth involvement, modernize social media pages as well as their website, and improve fundraising efforts. Those critiques were offered in a detailed memo along with strategies on how to improve them. Our presentation will give a summary of that memo and what we've learned from this experience about social movements.

Presenter: Corey Egler
Sponsor: Michael Abbott & Dwight Watson (Theater)
Title: The rising action: Theatre marketing and survival in a moderately sized city

In an ever growing and changing world, the desire for theatrical entertainment is constantly evolving. My project is an overview and analysis of a marketing project that I spearheaded for the 2014 IndyFringe Fest. Through this particular project, I was curious of how certain theatre groups survive. Through case studies of three theatres located in downtown Indianapolis, IN, I was able to analyze the aspects of location, competition, and collaborations with local organizations that theatres use in order to survive and better market themselves.

Presenters: Brian Gregory, Dykan Seikel, Ezequiel Godinez, Shane Beaman, & Austyn Belden
Sponsor: Sara Drury (Rhetoric)
Title: Gentlemen and citizens

The Gentleman's Rule at Wabash College calls us to be citizens on and off campus. In our freshman tutorial, we discussed what it meant to us to be an active citizen. We were challenged to enact our citizenship in a community engagement project. Through discussions with our community partner Pam's Promise, a nonprofit organization offering short-term assisted living, we determined the most effective use of our skills and abilities would be to hold a food drive to aid those in need. Together as a class, we created the Tackle Hunger: The Bell Game Initiative food drive. With the cooperation and support of the Student Athletic Advisory Committee (SAAC), we entered into a competition with our rivals down south and were able to raise food for the Crawfordsville and Greencastle communities. In this presentation, we will talk about the process of researching, planning, implementing, and reflecting on this project.

Presenter: David Gunderman
Sponsor: Brian Tucker (Modern Languages & Literatures)
Title: Gerrymandering: The destruction of democracy

Gerrymandering is a word that gets tossed around quite a bit during election years. We all know it has something to do with the drawing of legislative districts and that it is probably not a good thing, but what is it really and how does effect democracy? The word gerrymander first became a part of American political rhetoric in Massachusetts in 1812, when Governor Elbridge Gerry packed Federalist voters into a salamander-shaped district in order to favor his party's incumbents. Since then, state legislatures and governors around the country have gerrymandered their states' districts to favor incumbents. In this presentation I will explain what it means to "gerrymander" an electoral district and why electoral systems like America's are plagued by what is known as the "Wasted Vote" principle. I will also describe some of the methods by which other representative democracies in the world have mitigated the effects of gerrymandering. As gerrymandering is detrimental to the democratic process, it should be stopped. American voters should choose their representatives; representatives should not choose their voters.

Presenter: David Gunderman
Sponsor: Colin McKinney (Mathematics & Computer Science)
Title: Hölder estimates for Cauchy-type integrals

The well-known Cauchy Integral Theorem relates the boundary values of a holomorphic function on a disc in the complex plane to the values of the function on the inside of the disc. In essence, the theorem tells us that for certain types of functions the values of the function on the inside of any smooth curve are completely determined by the values on the curve. The central question of my research this past summer was the following.: is there an analog to the Cauchy Integral Theorem in multi-dimensional complex space? Although it turns out that a direct analog does not exist, the exploration of Cauchy-type integrals in products of the complex plane proves interesting and fruitful to the study of proper symmetric holomorphic maps. In this presentation, I will prove estimates in Hölder spaces for some Cauchy-type integral operators representing holomorphic functions in Cartesian and symmetric products of planar domains. This research was conducted with Ellen Lehet, Evan Castle, and Dr. Debraj Chakrabarti at Central Michigan University under the sponsorship of an NSF REU grant.

Presenter: Tim Hanson
Sponsor: Agata Szczeszak-Brewer (English)
Title: Narrating conditions

The presentation shows how institutions and ideologies within a society can maintain power over characters through a grand narrative. In particular, the presentation focuses on the character, Nayasha, from Tsitsi Dangarambga's *Nervous Conditions* and how she stands out in literature by recognizing the effect of the grand narrative on her and actively choosing to resist it. In her case, the institution is the previously colonizing European powers in Rhodesia (namely Britain) and their control over her as a Rhodesian and the ideology is that of patriarchy and its power over her as a woman. As the resistance to the grand narrative in the book, Nayasha serves as a voice of Tsitsi Dangarambga, the author, to bring awareness of the grand narrative, in neocolonialism and patriarchy, as it existed in Rhodesia at the time. In the presentation, the grand narrative will be thoroughly explained and evidence of my claim will be made through citation of the book.

Presenter: Wes Hauser
Sponsor: Amanda Ingram (Biology)
Title: My Alaskan summer as an orchid and watershed researcher

Working with the Smithsonian Environmental Research Center and the Kachemak Bay Research Reserve, I completed field-based biological research near Homer, Alaska. My summer's projects came in two flavors: the first focused on characterizing three native bog orchid populations and the second sought to map nutrient dynamics in two distinct watershed systems. For the orchid work, I conducted population surveys, as well as reproductive isolation and hand pollination experiments to garner more information on *Platanthera dilatata* (Tall White Bog Orchid). This research will inform future ecological studies on the species while updating the North American Orchid Conservation Center's national conservation database. The second portion of my research involved the collection of soil core, ground water, leaf litter, and root samples for control and fertilized sites along the Anchor and Stariski Creek watersheds. This work will elucidate the landscape's nutrient contributions to the larger river systems in which they lie. Preliminary findings indicate differences in nitrogen fixation and root biomass between these two treatments. As more information is collected, comparisons can be drawn between this pristine environment and more degraded watersheds in other parts of the world. Additionally, local land management protocols will be more informed based upon this information.

Presenter: Lu Hong
Sponsor: Scott Feller (Chemistry)
Title: Changes in retinal-opsin interactions during the rhodopsin photocycle

We employ molecular dynamics (MD) simulation with enhanced sampling techniques to explore the interactions of the G protein-coupled receptor (GPCR) rhodopsin with its covalently bound ligand, retinal, in a membrane rich in polyunsaturated fatty acids. Access to high resolution x-ray structures and long time scale MD simulations of both the inactive (dark) and activated (MII) states allowed us to examine changes in protein-ligand interactions as a function of the rhodopsin photocycle. We quantify these interactions by computing the free energy profile for rotation of the retinal β-ionone ring using Hamiltonian replica exchange molecular dynamics (H-REMD). By comparing the results for the bound ligand with a reference state of the same ligand in vacuum we measure the strength of the interaction with the protein for the dark and MII states. Our finding that interactions are fundamentally different for the two states provides insight into GPCR function and specifically addresses the role of reciprocal interactions in the opsin/retinal system that may be relevant for the deprotonation of the Schiff base that is a key step in activation.

Presenter: Jocelyn Hopkinson
Sponsor: Warren Rosenberg (English)
Title: Marshall Mathers (Eminem): Masculinity manifested

Rapper Marshall Mathers III, better known as "Eminem" or "Slim Shady," has produced some of the most popular and controversial music during his 10-plus years as an artist. He was the top-selling musician in the U.S. in the 2000s decade even though his lyrics are often violent and even repulsive, especially towards women and homosexuals. Also, he is a very successful white man in an art that is mostly created by African-American people. My presentation will analyze what Eminem's status as a megastar rapper says about hegemonic masculinity and race in society. The presentation will also show a change in Eminem's music over his career that might reflect society's change in attitude towards masculinity and race. It will consist of two other scholarly works — one to provide a framework for the presentation and the other to add critical analysis.

Presenter: Ryan Horner
Sponsor: Eric Freeze (English)
Title: *It Came Under Some Duress*: A short story

Since F. Scott Fitzgerald famously wrote "All good writing is swimming under water and holding your breath," in a letter to his daughter, writers of all kinds have been interpreting the metaphor in different and new ways. This story, among other things, is my attempt at understanding that metaphor. I'm starting to believe that the best short fiction is often crafted under severe restrictions (under water, holding your breath) rather than with absolute freedom. In the crafting process for *It Came Under Some Duress*, many restrictions have been imposed: the story must be shorter than 2000 words; it must have (at least) one shift in point of view; it must have two fully imagined female characters; and, above all, some part of the story must take place under water. Hypothetically, these strict frameworks place writers into an odd-shaped hole where they must imagine and create fiercely in order to bend the story into a shape that will allow escape. *It Came Under Some Duress* is the product of these strict limitations and corresponding imaginations.

Presenter: Patrick Jones
Sponsor: Ivette Wilson (Modern Languages & Literatures)
Title: *How the García Girls lost their accents*: A look at the literature about Latin American acculturation in the United States

This presentation analyzes the novel *How the García Girls Lost Their Accents* by Julia Álvarez as a way to examine the acculturation strategies of Latin Americans who immigrate to the United States. Each character in the García family is analyzed using the four acculturation strategies defined by cultural psychologist John W. Berry: assimilation, integration, separation, and marginalization. In the novel, the use of the assimilation strategy shows a desire to leave behind the Dominican culture and way of life. The level of assimilation in each character varies with his or her desire to leave the Dominican Republic and abandon Dominican customs. Integration is proposed as the ideal acculturation strategy; however, one must take into account the fact that immigrants do not have complete control over the acculturation process. The new country's residents also play a role in the immigrant's acculturation.

Presenters: Bilal Jawed, Daniel Purvlicis, Nelson Novack, & Uziel Rivera
Sponsor: Jeffrey Drury (Rhetoric) & Shamira Gelbman (Political Science)
Title: Analysis of a social movement organization (SMO): Friends of Sugar Creek (FOSC)

The purpose of this project is to analyze the social movement organization (SMO), Friends of Sugar Creek (FOSC), and offer detailed recommendations to the SMO regarding its political and rhetorical strategies. FOSC tasked our group with an initial research question, "How can FOSC get more members and more actively involved in current and new events" to help guide the subsequent research. Our group first met with a senior member of the board of directors, Douglas Calisch, and interviewed him about the current state of the organization. Focus of research included: membership, communication, and affiliated organizations, achieved through online sources, the FOSC website and social media, and newspaper bulletins. After a rhetorical and political analysis of FOSC, our group left the SMO with three central recommendations: amend the mission statement, define membership, and create a communications chair position. An amended mission statement would better fit the new educational role of FOSC since its change of identity. Secondly, a concrete definition of membership, which FOSC lacks, would remedy membership retention issues that the SMO struggles with. Finally, a communications chair position can address both internal and external communication issues that we recognized. With the preceding recommendations, we believe FOSC can refocus its identity and acquire a stronger membership base to have a more impactful footprint on the community.

Presenter: Kevin Kennedy
Sponsor: Agata Szczeszak-Brewer (English)
Title: Essentialism in Wole Soyinka's *The Lion and the Jewel*

My research is, in a larger sense, about the concept of essentialism. Essentialism is the usage of certain characteristics of a person, such as clothing, education, style of speech, and beliefs, in order to define a person as separate and "the other" from oneself. I applied a study of essentialism to a work of literature, Wole Soyinka's play, *The Lion and the Jewel*. Within this work, I chose to focus on one particular character named Lakunle. Lakunle is an educated schoolmaster in the town in which the play is set. He holds progressive beliefs, such as the abandonment of a local practice called the bride price, wears traditional British clothing (a full tweed suit), and sees himself as being more British. This leads to Lakunle being seen as "the other" within his interactions with members of the community, even though he was born and raised within the village. I chose to study this because I am interested in how we as people perceive each other in relationships. I wanted to examine the effects of prejudices, beliefs, and inherent differences in regards to how people separate from each other in the hopes of understanding the difficulties involved in forming relationships.

Presenter: Grant Klembara
Sponsor: Todd McDorman (Rhetoric)
Title: Metaphors and storytelling in economic discourse: Exploring the implications of Warren Buffett's inventive rhetoric

As a social science, economics is as much study about human interaction as it is markets. Thus, equal attention must be paid to the analysis of the economy and the words used to explain it. Through the use of metaphoric and narrative criticism, this presentation will examine the rhetoric of Warren Buffett, the President and CEO of Berkshire Hathaway Inc. in his yearly letter to investors. With special emphasis placed on his 2007-10 letters, I claim that by using metaphors, Buffett is able to create a strong, future-focused narrative for his audience to cling to amidst the developing financial crisis. These metaphors help him reduce complex economic activity to simple terms, direct attention to his agrarian understanding of the economy, emphasize his main goal of making secure investments, and ultimately, make a connection with his audience. In the process, Buffett identifies characters, creates a setting, identifies a major theme, and reveals characteristics of the narrator.

Presenter: Erik Kile
Sponsor: Brian Tucker (Modern Languages & Literatures)
Title: Antisemitism in Wagnerian Opera

Richard Wagner was a German composer, theater director and conductor, and is world famous for his operas. Wagner broke the rules on traditional opera, and paved the way on how operas are written today. Wagner was skilled in writing both the music and the libretto for his operas. Behind and hidden within the music lays controversy, which has left a permanent stain on how people view his operas and music. The lesser known side of Richard Wagner's life was his feelings towards the Jews. Wagner wrote a number of essays on his views of the Jews. This presentation explores how Wagner wove anti-Semitic representations into his operas in several ways.

Presenter: Zack King
Sponsor: James Makubuya (Music)
Title: *Gagaku*: The genre of Japanese courtship tradition

My presentation will cover the Japanese music genre known as *gagaku*, or imperial court music. In my Music 102 course, World Music, I have done extensive research regarding its origins, its stylistic characteristics, and the instruments used in order to create this genre. *Gagaku* is a genre meant for a lifestyle of refined taste, especially in court ceremonies. It is versatile as it can be illustrated at both large and small ensembles with a mix of both instrumental music and dance at public functions. I find this topic so important as it is a cornerstone in Japanese music. It ultimately affects the lives of millions of people in Japan and other parts of the world where it is performed, as it is a genre that represents a whole way of life. I hope to make this presentation based on the principle of wanting to extend my enthusiasm of this musical genre to many others. In order to illustrate my purpose, I will use samples of audio clips, video clips, and offer important information about this genre in order to illustrate my purpose.

Presenter: Ivan Koutsopatriy
Sponsor: Lon Porter (Chemistry)
Title: Exploring the PI3K signaling pathway

The phosphoinositide 3-kinase (PI3K) pathway is a key signal transduction system that links oncogenes and multiple receptor classes to many essential cellular functions. It is perhaps the most commonly activated signaling pathway in human cancer. This pathway presents both an opportunity and a challenge for cancer therapy. Inhibitors that target PI3K isoforms and other major nodes in the pathway, including AKT, have and are reaching clinical trials. This presentation describes my summer research with Dr. Tom Roberts at the Dana Farber Cancer Institute at Harvard, investigating the effectiveness of inhibitors on different patient derived cancer cell lines.

Presenter: Patrick Kroll
Sponsor: James Makubuya (Music)
Title: Hindustani music: The analysis of its contextual functions

As part of my research in the Global Perspectives on Music Cultures and Identity class, I chose to research music of India, focusing more specifically on Hindustani classical music. My focus was to find out how this music exists in the culture of Northern India, and how the people of India use it as part of their lives. My research revealed to me much about Hindustani classical music and its cultural function, including how this music is used as a sort of emotional expression and how this relates to the spirituality of the peoples of India. In my presentation, I will begin by sharing what I have learned about the type of Hindustani musical scales known as *raga*, and how they (*raga*) provide guidelines for musicians. By using audio and video examples, I will illustrate the definition of *raga*, the instruments used in the performance of Hindustani music, and the process by which the *raga* are performed. I will then discuss how the *raga* help the diverse people of India express specific emotions associated with seasons, times of day, or even specific life events.

Presenter: Patrick Kvachkoff
Sponsor: Jessie Mills (Theater)
Title: Building a character: A deconstruction of Nathan Detroit

An actor, in performance, is the liaison between the text and the audience. However, the path to performance is a long and complex process that begins at auditions. Most theatergoers only see the finished product of the final performance, and therefore may not consider that the brunt of the work is in its preparation. The performance is, in fact, only a small piece of the overall development of a character. In this presentation, I will open up this process to an audience. To do so, I will discuss my interpretation and development of Nathan Detroit in Wabash's recent production of *Guys & Dolls*. I will examine the major questions that helped to shape my role as well as the key ideas behind my rendition of this iconic character.

Presenter: Conner Lefever
Sponsor: Qian Pullen (Modern Languages & Literatures/History)
Title: Wrestling in China: A comparative study of the localization of Coca-Cola and PepsiCo, 2008

My presentation explores how the Coca-Cola Company, through the 2008 Summer Olympics in Beijing, employed creative and effective marketing strategies to draw Chinese consumers into the Coca Cola culture. In order to compete, PepsiCo initiated and operated a different set of promotions to adapt the Chinese culture by redesigning taste and looks of their products and emphasizing the medicinal usage of food, a gesture to demonstrate their commitment to fulfill the Chinese consumers' cultural appetite. In my presentation, I define their competition in China during the 2008 Olympics not simply in terms of competition for profits, but also from the cultural perspective of that consuming foreign food also means to consume the foreign culture. In other words, while the two American companies competed to fulfill Chinese consumers' needs, they also gradually infused different aspects of American pop culture among the Chinese urban folks, especially the Chinese youth, so as to attract various consumer groups.

Presenter: Reece Lefever
Sponsor: Qian Pullen (Modern Languages & Literatures/History)
Title: What does a manly man eat?: McDonald's regionalization in today's China

My presentation focuses on McDonald's television commercial series in China called Manly Man Beef. The series contains five different commercials for different areas in China. The commercials intend to promote the Big Mac sandwich. There is a commercial that is played nationally throughout China, and then there are commercials made specifically for the cities of Shanghai, Shenzhen, Guangzhou, and Beijing. Each commercial portrays different manly traits from the viewpoints of young and urban Chinese women in each region. As humorously presented in each commercial, manliness has been socially constructed from the gender perspective. However, as presented differently in each city, manliness has been defined regionally as plural and diverse. Each commercial ends by showing a guy eating a Big Mac and portrays the guy as being a manly man for doing so. In other words, the message is clear: regardless of what kind of manly man that you are, you must eat a Big Mac.

Presenters: Clayton Lengerich & Eddie Pingel
Sponsor: Jeremy Hartnett (Classics)
Title: The differing worldviews of Flavius Agricola and Flavia Primitiva: An analysis of their thoughts on life and the afterlife

This paper examines one aspect of the funerary monument of Flavius Agricola, which originally stood along the *Via Cornelia* in Rome, is now in the Indianapolis Museum of Art, and was the subject of the Fall 2014 Classics senior seminar. The monument not only consists of both a sculpture depicting the deceased, but also a funerary epitaph. Interestingly, almost half of the inscription concentrates not on Flavius, but on his wife of thirty years, Flavia Primitiva. Among other features, she is described as a chaste worshipper of Isis, the Egyptian goddess at the center of a "mystery cult" that promised an afterlife. This aspect of her portrayal is especially intriguing because it seems that Flavius himself had a well-considered worldview that contrasts markedly with hers: for example, he encourages viewers "to not deny sexual pleasures to pretty girls," and he claims that "after death, earth and fire consume all." My presentation will weigh the outlooks of the two spouses against one another, considering how aligned or divergent they were, and what all this potentially reflects about Roman society in the second century CE."

Presenter: Albert Li
Sponsor: William Turner (Mathematics & Computer Science)
Title: Methods for finding the nullspace of sparse matrices in Linbox

The author worked on developing both blackbox and nonblackbox methods in exact algebra to calculate the nullspace of a sparse matrix. This talk will present 3 algorithms: Gaussian elimination, Gram-schmidt method and Krylov-based preconditioning, which are used to find the nullspace and will compare and contrast them based on computational speed, space required, as well as whether or not the method is blackbox. The author developed these methods using LinBox, a C++ template library for exact algebra. Linbox is designed as middleware, as a level between user input and low level field arithmetic. Linbox is designed to use a variety of different algorithms, to best solve the problem given. Linbox is most interested in blackbox methods, which treat matrices as functions, regardless of implementation. This allows for greater flexibility when programming algorithms and can take advantage of efficiencies when dealing with large structured matrices.

Presenter: Xinyu Ma
Sponsor: Qian Pullen (Modern Languages & Literatures/History)
Title: Globalization 101: Understanding KFC's business success in China

Since its arrival in China in the late 1990s, Kentucky Fried Chicken (KFC) has made tremendous business success. What distinguishes KFC from other fast food chain restaurants in China? In my presentation, I seek to answer this question through the lens of globalization and localization. I will highlight KFC's unique business strategies in accommodating local demand and keeping up with global standard. In particular, I will present how KFC promotes E-commerce through newly developed social networking sites, such as Weibo and Renren (Chinese equivalents of Twitter and Facebook.) Finally, through this interdisciplinary study of the history of the fast food industry, I hope my findings about globalization and localization can be applied to industries beyond KFC. As an economics major, such research to combine business history with social history would benefit me further to form a focused research area in my graduate studies.

Presenter: Max Millott
Sponsor: Dennis Krause (Physics)
Title: Summer REU at Purdue: High temperature superconductivity

This summer I participated in a REU (Research Experience for Undergraduates) program at Purdue University. This program allows undergraduates around the country to gain valuable experience in research at prestigious research institutions. I worked alongside Dr. Carlson, a condensed matter theorist who focuses on research high temperature superconductivity. Her research has led her to develop a technique for analyzing high resolution imaging of superconductive materials. This technique seeks patterns in the cluster patterns on the surface of certain materials. What seems random and chaotic at first, starts to form patterns when Dr. Carlson uses her technique. My task this summer was to find research that would be valuable for Dr. Carlson to use her image analysis on. In addition to finding research for Dr. Carlson, I also had several opportunities to learn many things about frontier research in the physics world today.

Presenter: Joe Mount
Sponsor: James Cherry (Theater)
Title: *I, Nephi: A Gay Mormon's Survival Guide*: Presentation on process

Joe Mount '15 began writing his one-man show, *I, Nephi: A Gay Mormon's Survival Guide*, on June 1, 2014 for his senior capstone project as a theater major. The goal was to come up with a project that would incorporate what he had learned from theater during his time at Wabash College, but *I, Nephi* became more than that. Using his own experiences, Joe wanted to explore those issues that seem to be constant in our lives: god, sex, family, death. Growing up in the Mormon Church, and being gay at the same time, Joe saw an opportunity to explore that desire that we all have: the desire to be who we are, and the drive to be something else. This oral presentation is focused on the process of developing this one-man show, and the work that continues to go into it. It briefly covers the motivations behind the work, the writing process, the staged reading performed in December 2014, and future plans for the piece.

Presenter: Tyler Munjas
Sponsor: Ivette Wilson (Modern Languages & Literatures)
Title: The theme of death in Quiroga's short stories

This paper explores the theme of death, and its subsequent development, in two of Horacio Quiroga's famous short stories, *El hombre muerto* and *A la deriva*. The first section of the paper investigates Quiroga's life and how the many tragedies he experienced manifested themselves into the themes of his works. The next section advances this claim by analyzing the two primary texts and drawing on supporting evidence from secondary texts. This section portrays how death is natural and inevitable in Quiroga's stories. This paper then seeks to explain the role nature plays, as both stories are set in the jungle. Nature is the omnipotent stage on which the characters live. It acts without reason and allows death to strike the characters when they least expect it. Therefore, this paper concludes that life appears meaningless since man's reason is useless in controlling nature and unable to prevent inevitable death from a force that acts without reason. He also advances this claim by exhibiting how the rest of the world continues without pause after the characters death, which is evident in the characters' reaction. Ultimately, this paper seeks to analyze how Quiroga presents death in a unique manner through the relationships between man, death, and the stage on which both are acted out; nature.

Presenters: Macallister Norton & Adam Burtner
Sponsor: Sara Drury (Rhetoric)
Title: Planning and analyzing a public deliberation event

This presentation will focus on discussing the process of planning, implementing, and analyzing a public deliberation event. The "Sustaining Ourselves" deliberation, led by Mac Norton and Adam Burtner, with help from other Democracy Fellows and Professor Sara Drury, took place on November 16, 2014, at the First Presbyterian Church in Urbana, Illinois. This deliberation was the final event in a church series on sustainability. To create a local perspective on the event, Norton and Burtner created an informational handout to supplement the National Issues Forums guide on sustainability, and also created a facilitator guide for the event. The deliberation itself was conducted in the National Issues Forums style, with three broad approaches to improving the nation's sustainability. Participants were split into groups, discussed each of the three approaches to addressing the problem, and then gathered at the end for a reflection and report period. In the analysis of the public deliberation, we found that the issue is seen as very pressing, and the participants communicated the value of deliberation. In this presentation, we reflect on the process of planning a civic engagement event, as well as what the Wabash Democracy and Public Discourse Democracy Fellows have learned from this experience.

Presenter: Andrew Powell
Sponsor: Shamira Gelbman (Political Science)
Title: Senate candidates on Twitter

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 subcategorized as an attack, issue, mobilization, or combination tweet. These tweets were all then sorted and analyzed using a number of categories including the state, party, and incumbency or lack thereof of the tweeter, as well as the race's competitiveness, President Obama's percentage of the vote in that state, and the number of favorites/retweets received. The results showed that overall candidates tweeted more in competitive races, and that party affiliation was a strong indicator of what kind of tweet was used.

Presenter: Alejandro Reyna
Sponsor: James Makubuya (Music)
Title: The cultural importance of *Mariachi* music

In one of my class researches, I focused on *Mariachi*, a term used for referring to a music genre documented not only to have originated in western México but also currently very popular in all of México. The purpose for this research is to enhance my comprehensive understanding of why this *Mariachi* genre is so popular. What this presentation aims to do is to reveal my research findings about *Mariachi* music, from an ethnomusicological perspective, that allows for the understanding of its significance in Mexican culture. The research findings I will present include those based on organology (study of folk musical instruments) and the steady rise of the popularity of the *Mariachis* in México. In addition, my presentation will reveal what my research allowed me to learn and compile regarding what creates and defines a *Mariachi* group pertaining to the music. Part of my research presentation includes two musical pieces that are analyzed for the illustration of the *Mariachi* texture, melodic contour, contextual function and cultural function. In conclusion, I will briefly discuss how this research allowed me to further understand the basis for *Mariachi* music's adoration in Mexican culture today.

Presenter: Douglas Rourke
Sponsor: James Makubuya (Music)
Title: The *kora* harp lute: Its sacred tradition and music among the Mande people

Birthright and a lifetime of experience are required to play the *kora*. With twenty-one strings played by only four fingers, the *kora* is the most complex chordophone in sub-Saharan Africa. The Mande people, who have a rich musical culture with an artisan class dedicated to being musical and oral historians, are the ones that play this instrument. The members of that class are referred to as the *jeli*. The *jeli* are known to have been closely linked to the ruling elite of the Mande Empire since its creation. According to my research, the *jeli* are given nearly exclusive right to play the *kora*. These *kora* players spend much of their life learning how to play and perform songs of praise and commemoration. *Kora* music involves incredible virtuosic ability. Performers can seem meditative when playing, but still synthesize performances that make listeners of all types smile. In my presentation, I will use both images and audio and video clips as illustrations to share the fascination of my research that recently, the *kora* has resonated with a wider audience that has consequently resulted in greater exposure to and appreciation of Mande music as well as the music of all West Africa.

Presenter: Kyle Schwab
Sponsor: Qian Pullen (Modern Languages & Literatures/History)
Title: Internment in the United States during World War II: Lies, realities, and the struggle for representation

My presentation, primarily pertaining to the years 1941-1950, concerns the history of internment camps in the United States during (and for a short time, after) World War II. I embarked on this project in order to learn more about the experience of Asians and Asian-Americans in the United States, though my topic has also largely focused upon the experience of those of German/Italian ancestry as well. In analyzing online databases containing both primary and secondary materials, as well as personal memoirs, pamphlets, government documents, and books, I have relied largely upon a combination of political, military, social, and historical analyses. Through my research, I have found that the reasons for internment, and the reality of internment, is a far cry from the formal statements issued by government organizations and individuals. I have also found that, historically (and even today), representation for those minor ancestries (German/Italian) who were interned within these camps is still a problem which must continue to be addressed both in the professional and private sectors.

Presenter: Logan Taylor
Sponsor: Jennifer Abbott (Rhetoric)
Title: You are not a hero: An ideological analysis of *Spec Ops: The Line*

What is a hero? There are many forms of media which attempt to answer this question, with video games being front and center. Video games, and more specifically, military shooter games, are often known for being a form of escapism from the stresses and horrors of the modern world, and they do so by making the player feel like a hero, and by making them feel invincible. But the military shooter *Spec Ops: The Line*, loosely based on *Heart of Darkness*, takes these traditional video game ideals of heroism and escapism and thoroughly rejects them, bringing the player on a journey in which they are forced to do horrible things and are confronted for it. My talk will examine how *Spec Ops: The Line* rejects these ideals through its use of symbolism, the numerous double-entendres in the dialogue near the end of the game that speak to the protagonist of the game's story as well as the player themselves, through its gameplay, and through its clever use of the video game trope of offering players gameplay tips during loading screens. *Spec Ops: The Line* is a great game, so come to my talk and see exactly what makes it so.

Presenters: Tyler Trepton & Connor Karns
Sponsor: Qian Pullen (Modern Languages & Literatures/History)
Title: Marketing and promotional campaigns of McDonald's in China from 2008 to 2014

McDonald's opened its first restaurant in China in the early 1990's. Since then it has grown to over 4,000 restaurants and has created a new food industry in China. None of this would have been possible without the successful marketing and promotional strategies as seen throughout 2008 Beijing Olympics and their Champion Kids campaign. McDonald's sought to find a target audience to display the attributes in the Big Mac, thus creating the Manly Man ad campaign in China. Through this campaign we will examine and compare how the Chinese marketing targeted a certain audience compared to the United States who targeted a different audience. In addition to the Manly Man promotion, McDonald's also used the décor interior outside and inside of their restaurants to target a whole new audience in the families' experience while eating fast food using a theme of togetherness which is an important cultural aspect of China, and in creating a *World of Warcraft* themed store to bring a new gaming community into McDonalds. This presentation will accomplish how McDonald's has provided successful promotional campaigns which have increased business and provided a new lifestyle of food in China.

Presenter: Tanner Watson
Sponsor: Adriel Trott (Philosophy)
Title: Foucault and Agamben: How the State became racist

I plan on using Giorgio Agamben's *Homo Sacer* and Michel Foucault's *Society Must be Defended* to provide an account for how the State became racist. With the outpouring of public opinion on recent racial tensions here in the United States, I think this is a topic worth the effort to think about. Three interrelated questions will guide this essay: Why does the sovereign want the power of death? How does biopower present a problem for this? And, finally, how does racism allow for this division within sovereignty? In answering these questions I will argue that the sovereign must be racist if he wants to remain sovereign, and he is only allowed to operate in this way because of the paradox of sovereignty.

Presenter: Aaron Wirthwein
Sponsor: Dennis Krause (Physics)
Title: String theory: Making string analogs of optical interferometers

Interferometers are important tools used in optics and quantum mechanics for practical applications and revealing fundamental principles. Michelson and Morley used an interferometer to show that electromagnetic waves do not require a medium to travel through space, which led to Einstein's postulate that the speed of light be the same for all inertial reference frames. Optical interferometers are difficult to intuitively understand without a comprehensive knowledge of optics and/or quantum mechanics, so we designed a one-dimensional interferometer using ideal strings and elementary physics. To accomplish this, we created string analogs of mirrors and beam splitters and combined them to create a string-analog Mach-Zehnder (M-Z) interferometer. The optical version of the M-Z interferometer has served as an important tool for uncovering the quantum nature of our world, and we hope that its string-analog will serve as an important tool for understanding its inner-most workings.

Presenter: Yunan Wu
Sponsor: Karen Gunther (Psychology)
Title: How do children learn to access the unsaid?

Communication requires that listeners understand both explicit and implicit information in a sentence. Children are unable to process scalar implicature, a type of inference that conveys implicit information. Yet they can understand sentences in an ad-hoc implicature task, which is an inference with a discourse context. In the current study, we use an eye-tracker to assess whether prosodic cues, or word stress facilitate 3 to 4-year-old children's real-time processing of ad-hoc implicature. Proficient English speaking participants were recruited to watch a short cartoon that contains an ad-hoc implicature task while their eye-movements were recorded, and prosodic cues were added to the task in the experimental group. This study revealed young children's ability to use stress patterns to disambiguate speaker's intentions.

Presenter: Shane Xuan
Sponsor: Alexandra Hoerl (Political Science)
Title: (Anti-)Theory of human rights: Distributive justice

Debates on whether there should be a list of definitive, determined, and abstracted human rights have been intense since the publication of Burke's *Reflections on the Revolution in France* and Thomas Paine's *The Rights of Men*. On one hand, there has been a plethora of scholarly publications leaning against a constructed list of human rights since it does not allow for the evolution of human rights. "The approach of open public reasoning," Sen argues, although leaving certain disputes tentatively unsettled, "is no embarrassment to a theory of human rights." On the other hand, human rights activists believe in the notion of universalizability, vehemently arguing for a list of human rights that should be guaranteed to every person regardless of consequences. Robert Nozick, instead of being prone to any side, puts forward the entitlement theory, which in a sense offers an alternative way in thinking of the possibility and necessity of a determined list of human rights. My presentation will be innovative defense and critique of Nozick's theory of attenuated human rights in the context of this debate.

Poster Presentations (Listed by Poster Number)

Poster #1
Presenters: Bradon Badger, Eric Need, & Kelly Sullivan
Sponsor: Martin Madsen (Physics)
Title: Always on target

Our goal for this experiment was to understand the vibrational dynamics of a constrained layer damping device. We measured the longitudinal frequencies at different locations along purpose-built gun barrels that contained different epoxies and compared our results with acoustic data. We found that our most efficient constrained layer damping device did indeed dampen the normal frequencies at which the barrel resonates, thereby making the firearm more accurate.

Poster #2
Presenter: Keaton Holsinger
Sponsor: Amanda Ingram (Biology)
Title: What's the buzz about pollinator efficiency?

The geographical distribution, population structure, and pollination ecology are key aspects in assuring the persistence of prairie populations. Increases in population fragmentation means pollinator populations are becoming increasingly important to the prairie's survival. Prairie plants, such as the purple coneflower (*Echinacea angustifolia*), rely on pollen transferred by a number of different genera of solitary bees, which vary in their ability to transfer pollen. In Minnesota tall-grass prairie remnants, we observed pollinators that visited the purple coneflower, *Echinacea angustifolia* (*Asteraceae*). Using the measure of style persistence we were able to analyze the efficiency of each individual pollinator. Pollinator efficiency was measured by the number of styles that each pollinator was able to successfully deliver pollen to. Pollinator efficiency data were gathered over four separate years (2010, 2012-2014) between the months of July and August, resulting in a total of 264 pollinator visitations. A generalized linear model showed that pollinator taxon had a significant effect on pollinator efficiency ($df=7$, $p<0.001$). *Andrena spp.* were more efficient than all other taxa ($p<0.001$) except female *Melissodes spp.* ($p=0.06$). This finding shows that some taxa of pollinators may play a more important role in the persistence of fragmented prairie populations.

Poster #3
Presenters: Adam Boehm, Daniel Bowes, Keaton Holsinger, Chris Stazinski, Chase Young, Niki Kazahaya, & Adam Rains
Sponsor: Neil Schmitzer-Torbert (Psychology)
Title: Differences in brain activations during memory-guided and GPS: Guided wayfinding in a virtual city

The hippocampus has been known to play a role in memory-guided spatial navigation. As smartphones have become increasingly prevalent, the amount of people using GPS in order to get around has drastically increased, and some researchers have expressed concerns that such use may impair hippocampal memory. But, does the use of a GPS actually change hippocampal activity during navigation? To examine the effect of GPS use on hippocampal activity, we trained five males to navigate a virtual city. After 25 minutes of exploration, participants completed a set of probe trials during fMRI scanning, in which they navigated to landmarks in the city using their own cognitive map or using a GPS. After each probe trial, participants were tested in a control task in which they navigated in a featureless city. There was a significant activation of the hippocampus in both the Cognitive Map and GPS trials, compared to Control trials. However, hippocampal activity was significantly decreased when participants used a GPS to navigate. While preliminary, the results of this study support our hypothesis that relying on technology such as GPS when navigating suppresses hippocampal activity, and may produce impairments in spatial navigation when GPS devices are not available.

Poster #4
Presenter: Bilal Jawed
Sponsor: Eric Wetzel (Biology)
Title: Disease vectors of Montgomery County: The mosquito

The parasite that causes malaria, one of the leading causes of death in the Sub-Saharan Africa, is transmitted though the mosquito vector *Anopheles*. Vectors are organisms that are possible carriers and transmitters of infectious diseases such as bats, rodents, and mosquitos. Thus, even in Montgomery County, vector-borne disease can pose a significant risk to the public health of the community. Locally, the County Health Department primarily focuses on controlling the vector population of mosquitos because of their prevalence, their nuisance to the public, and the danger of West Nile Virus. The vector program has three main components: surveillance, adulticiding and larviciding. Every proper public health program begins with assessing the situation. In this investigation, we accomplished this by determining a baseline for possible West Nile risk hotspots in Montgomery County. Unlike a standard density map, we created a risk heat map depicting the overlap between human activity and mosquito activity. Mosquito populations were trapped throughout the county based on three criteria: human activity, mosquito activity, and complaints to the health department. Mosquito samples were then analyzed for density and species before being tested for West Nile Virus. The final heat map indicates where the final two parts of the vector program, adulticiding and larviciding, were deployed, allowing for significantly more efficient use of health department resources.

Poster #5
Presenter: Nicholas Boyce
Sponsor: Anne Bost (Biology)
Title: Impacts of pawpaw on photosynthetic photon flux available to tree seedlings

Understory shrubs can effect forest regeneration by reducing the light available for tree seedlings. Ecological research on pawpaw (*Asimina triloba*), a clonal shrub species, has not examined how it impacts light in the forest understory. Pawpaw has increased in abundance at Allee Memorial Forest (AMF) and this research examines the relationship between pawpaw foliage area and light transmission. What are the consequences on tree sapling abundance as a result of pawpaw abundance? A belt transect was placed in 10 pawpaw patches in 3 different old growth tree stands at AMF. The transects were segmented into 2 by 2 meter cells and in each cell the Photosynthetic photon flux (PPF; micromole/m^2/s) was measured above the pawpaw canopy and at 25cm, along with the total leaf area. Across the patches, PPF above pawpaw ranged from 158-35, below ranged from 19-2, percent PPF transmittance ranged from 25-9%. Positive relationships were observed between PPF above and pawpaw foliage, and a negative relationship between LAI and PPF transmittance. The PPF below pawpaw was small enough to effect sapling survival and growth. PPF levels below pawpaw were generally 0.5% of full sun, low enough to effect seedling survival and growth of all species, with potential impacts on regeneration at AMF.

Poster #6
Presenters: Joe Mount & Stephen Batchelder
Sponsor: Derek Nelson (Religion)
Title: Wabash Pastoral Leadership Program: Summer internship experience

This last summer, Joe Mount ’15 and Stephen Batchelder ’15 worked as interns for Dr. Derrick Nelson and the Wabash Pastoral Leadership Program (WPLP) – a career development program for Indiana ministers with the goal of enhancing ministry and ecumenism throughout the state. During their summer, Stephen and Joe had the opportunity to sit in on the sessions held for the pastors, attend a conference on Martin Luther with world-renowned theologians, and develop research projects that have been implemented into the program. Stephen’s work was largely concerned with developing a resource for current and future WPLP participants to use when addressing issues related to healthcare. Joe was responsible for a report on comparative career development programs for ways to expand or improve the WPLP. Along with these two projects, this presentation is a reflection on the work and experiences Joe and Stephen had while working for the Wabash Pastoral Leadership Program.

Poster #7
Presenter: Jacob Burnett
Sponsor: Michael Burch (Political Science)
Title: Specialists in violence: How individual backgrounds of African leaders affect development

What characteristics of individual leaders influence a country's development? National leaders are increasingly popular units of analysis in international politics. I contribute to this literature by demonstrating that individual characteristics of leaders that predispose them to violence lead them to adopt policies or behave in ways that negatively impact the development of their respective countries. Therefore, my analysis attempts to examine a variable that theoretically precedes decisions and impacts decision-making processes – predispositions towards violence or levels of aggression. My research tackles this idea through a statistical analysis of Sub-Saharan African leaders since 1989. To capture a predisposition toward violence, I consider whether or not the leader was a rebel, military personnel, politician, or entered office through irregular means. In order to understand how leadership background can influence development, I utilize GDP per capita as a proxy for overall development. Using regression analyses, I find evidence for three of four of my hypotheses. Individuals who come to office via means of violence or have military backgrounds have a negative impact on country's development when compared to leaders who enter office through regular means, are political leaders before entering office, or were rebels before entering office.

Poster #8
Presenters: Max Nguyen, Joe Sukup, & Kevin Wynder
Sponsor: Ivette Wilson (Modern Languages & Literatures)
Title: ¡Revolución!

In early 2014, the Modern Language Department received a collection of woodcut prints about the Mexican Revolution. Three students of Spanish: Max Nguyen, Joe Sukup, and Kevin Wynder volunteered to turn them into an art exhibit. In our 15-minute video, we show the audience how the leftist artists of the group Taller de Grafica Popular re-envisioned the Mexican Revolution in light of a struggle between the working class and the bourgeoisie. Our video demonstrates how the artists depict events during the Revolution in a way that reflects their left-wing points of view. In addition, we will showcase all 85 prints of the collection, which tells the major story and the important characters during this tumultuous and crucial period of Mexican history.

Poster #9
Presenter: Colin Downey
Sponsor: Karen Gunther (Psychology)
Title: Non-cardinal color mechanisms: Stimulus size matters

The current experiment seeks to understand the effect of stimulus size on non-cardinal color mechanisms in all three planes of color space. Multiple studies have shown subjects to perform better on cardinal colors than non-cardinal colors, especially in the Red-Green (RG)/Black-White (Luminance a.k.a. LUM) and Blue-Yellow (BY)/LUM color planes. Solomon, Peirce, and Lennie (2004) showed that stimulus size affects the strength of the luminance suppressive surround, which might make non-cardinal mechanisms in the RG/LUM and BY/LUM planes more sensitive to stimulus size. We therefore tested 10 color-normal subjects on visual search at four dot sizes (0.5, 1, 2, & 3°) in each of the three color planes (RG/BY, RG/LUM, & BY/LUM). A two-way ANOVA on the RG/BY color plane yielded a significant main effect of color axis ($p=0.024$, $\eta^2=0.45$), a significant main effect of dot size ($p=<0.001$, $\eta^2=0.52$), but no interaction ($p=0.365$). The RG/LUM color plane also yielded a significant main effect of color axis ($p=0.020$, $\eta^2=0.47$), a significant main effect of dot size ($p=<0.001$, $\eta^2=0.65$), but no interaction ($p=0.282$). Similarly, the BY/LUM color plane yielded a significant main effect of color axis ($p=0.020$, $\eta^2=0.47$), a significant main effect of dot size ($p=<0.001$, $\eta^2=0.48$), but again no interaction ($p=0.424$). These results suggest that non-cardinal mechanisms in the RG/LUM color plane may be more sensitive to stimulus size (due to a larger effect size) than the isoluminant plane.

Poster #10
Presenter: Aren Peterson
Sponsor: Anne Bost (Biology)
Title: Epilepsy treatments in *Danio rerio*

This summer I did research overseas with the University of Luxembourg. The particular experiment was part of a longer project done with the LCSB (Luxembourg Center for Systems Biomedicine) examining the antiepileptic effects of different plant extracts on Zebrafish (*Danio rerio*). Zebrafish serve as an excellent model to examine the effects of small doses of compound, as embryos and developing larvae are quite receptive to compound treatments. Fish larvae absorb chemical compounds dermally, and the effects of the compound can be directly observed under a dissecting microscope. The experiments conducted with them focused on the effects of small doses of plant-extract. Plants considered to be anti-epileptic in traditional medicine had compounds extracted and separated to scan for effective chemical treatments. My presentation is a poster that explains the purpose, results, and discussion of this experiment.

Poster #11
Presenter: Travis Flock
Sponsor: Amanda Ingram & Bradley Carlson (Biology)
Title: Tracking blue catfish movement in Chesapeake Bay using acoustic telemetry

Invasive blue catfish were first introduced in the James, York, and Rappahannock Rivers in Virginia in the 1970s. Since then the species has spread to other tributaries of Chesapeake Bay, which has been correlated with the decline of native species, such as the white catfish. Management strategies for the invasion have recently been discussed between Virginia and Maryland, but the movement of the blue catfish is not yet understood which makes management plans more complicated. The aims of this research were to examine the movement of blue catfish in the Patuxent River, MD, by using acoustic telemetry implant tags. Tagging was performed by first capturing fish by means of either electrofishing or jug-lines. Once captured, the fish was anesthetized and then implanted with a tag. The fish was then allowed to recover and set back into the Patuxent River. Data was collected by receiver stations that were placed about 1000km apart from each other across the Patuxent. The receivers were downloaded for data about every three months, and data that spanned almost a year was analyzed to determine if correlations existed between fish length and distance traveled, as well as what was the fastest speed of any tagged fish in the experiment. From the preliminary data no correlation exited between the length of the fish and distance traveled, as well as the number of stations detected at. The fastest speed of any fish was nearly 3.3 km/h, and the average number of detections/day across the study was 30%. These findings are important in going forth with management strategies as it shows that a large size is not needed for the species to be capable of fast and long-distance travel, which will further complicate previously discussed management plans.

Poster #12
Presenters: Josh Santana & Justin Miller
Sponsor: Laura Wysocki (Chemistry)
Title: Designing an efficient and practical polarity assay for xanthene dyes

The open–closed equilibrium of xanthene dyes like rhodamine B is a key characteristic of fluorescence to understand and compare in novel probes. Rhodamine B and related compounds are pH insensitive over a significant range, making comparison difficult. However, the local environment, including the polarity of the solvent, can affect the equilibrium between the closed, nonfluorescent state and the open, fluorescent state. We have developed an efficient polarity assay to characterize and compare structurally unique rhodamine B derivatives and have optimized the assay for more general use to investigate novel probes.

Poster #13
Presenters: Michael Haffner & Brandon Wongngamnit
Sponsor: Anne Bost (Biology)
Title: AHL expression in marine bacteria

Bacteria are social creatures. Some live together in 3D biofilms in which apartment-like niches enable neighbors to support or combat each other's metabolisms; some exchange genetic information, conferring antibiotic resistance on susceptible populations; some partner with eukaryotes in regulating diurnal cycles; however, most communicate. We are especially interested in a form of bacterial communication known as quorum sensing. Quorum sensing depends on the production, secretion, and recognition of diffusible molecules called autoinducers that typically regulate gene expression in response to cell crowding. Among Gram negative bacteria, the primary form of autoinducer is the fatty acid derivative, N-acyl-homoserine lactone (AHL). The relationship between cell density and AHL production has been well documented in *Vibrio fischeri* but is less well understood for the closely related *Photobacterium phosphorium*, a Gram-negative bioluminescent symbiont of marine fish and a common spoiler of commercial cod filets, and *Agrobacterium tumefaciens*, a Gram-negative symbiont of broad-leaved plants like roses and grapes, and the causal agent of crown gall disease. We therefore investigated the impact of crowding on AHL secretion in these species. Because bioluminescence can be quorum regulated by AHL's in marine bacteria, we also explored the relationship between bioluminescence and AHL expression in our *P. phosphorium* strain. Previous studies by Flodgaard et al (2005) indicated that bioluminescent P. phosphorium strains do not express AHL's, whereas about half of non-luminescent P. phosphorium strains do express AHL's. Interestingly, the *P. phosphorium* strain we used was a gift from Dr. Tom Platt, who had shown that the bacteria grew well in either of two salty media but bioluminesced only in one of the media types. Consistent with Flodgaard's work, Platt also had shown that this *P. phosphorium* isolate produced AHL's in the nonbioluminescent medium. Having confirmed the strain's genetic ability to produce AHL's, we next sought to determine if this isolate would continue to produce AHL's when grown in medium to induce bioluminescence—*i.e*, to investigate the potential regulatory loop between AHL's and bioluminescence.

Poster #14
Presenter: Jingwei Song
Sponsor: Amanda Ingram (Biology)
Title: Microsatellite analyses of tautog, *Tautoga onitis*, population structure off the Atlantic Coast

Tautog (*Tautoga onitis*) support an important recreational fishery along the U.S. east coast. Tautog are currently managed by the Atlantic States Marine Fisheries Commission (ASMFC) as a single coast-wide stock from Massachusetts to North Carolina. However, years of restrictive management efforts have not been effective in restoring this overfished species. This raises the question of the validity of the current management plan. To address this question, we surveyed seven microsatellite loci to investigate the genetic stock structure of tautog sampled from Triangle Reef, Virginia (VA) and Cape Cod Bay, Massachusetts (MA). Significant differences were found between samples from MA and VA, indicating the existence of distinct stocks. This information is crucial to the appropriate management of this important recreational resource and is of interest to recreational anglers throughout Virginia.

Poster #15
Presenter: Tim Hanson
Sponsor: Ciara Darby (Malcolm X Institute)
Title: South Africa: Where are we now?

What happened in 1994 in South Africa with the election of Nelson Mandela as president without bloodshed is nothing short of a miracle and its legacy echoes even to this day. Ever since that time, America has looked away from its developments and plopped it down as a beacon of progress without observing its current track. Unfortunately, a lot has changed since then and for the worse, particularly with the rise of racial tensions now that the honeymoon period has ended. To this day, the average white South African will earn twice as much income as the average American while the average black African will earn about a tenth or a twelfth of an American income. In turn, the black community looks to potentially becoming very hostile. It has come to the point that Dr. Gregory Stanton has placed genocide procedure on a level six. Level seven is the execution of victims. Much of this has to do with the failure and corruption of the ANC. South Africa has become the rape capital of the world and the murder capital of Africa. Economic development is frightfully lacking and is in fact shrinking with business interaction being impossible without the approval of the inept ANC. The president, Jacob Zuma, is the cause of much of the aggression, diverting attention away from his incompetence and corruption by reviving a pre-Apartheid mentality concerning race relations.

Poster #16
Presenter: Kyle Stucker
Sponsor: Sara Drury (Rhetoric)
Title: The stories and messages of the Library of Congress

The Library of Congress is a building renowned for its beauty and culture. The Library was founded in 1800 and the current building was constructed in 1897. This paper is a rhetorical analysis of the Library of Congress and uses an ideological criticism to determine what ideology is being communicated by the Library. The analysis begins with an examination of the historical context of the Library of Congress, addressing the role that Thomas Jefferson and early librarians had in the growth and development of the library from a small room in the capital building to the ornate "book palace" that exists today. The rhetorical analysis of the Library of Congress is primarily orientated around the use of space and materiality throughout the Thomas Jefferson building, particularly the murals in the reading room, statues throughout the building, and murals in the grand hall. The analysis demonstrates that the space and materiality, along with objects of décor, promote universality, progressivism, and knowledge.

Poster #17
Presenter: Lu Hong
Sponsor: Neil Schmitzer-Torbert (Psychology)
Title: Assessing navigation performance in virtual environments on mobile devices

Virtual navigation paradigms are useful for the study of memory in humans. However, such studies typically collect data using desktop and laptop computers, while mobile devices and tablets are becoming increasingly prevalent. The aim of this study was to assess navigation performance using standard virtual navigation tasks adapted for mobile devices. A set of virtual navigation tasks (Barnes maze, Morris water maze, and radial maze task) were developed for Android tablets. A total of 10,973 installations of the game were obtained. Across all three tasks, reaction times on the probe trial and the trial preceding the probe were consistently correlated. Participants who made fewer errors on the radial maze task probe trial were more likely to use a response strategy on the Barnes maze probe. Additionally, age was associated with longer latencies in the water maze, and with the use of response strategies on the Barnes maze probe trial. Data were also collected using desktop versions of the tasks under laboratory conditions, and largely replicated the findings in the mobile sample. Our results demonstrate the utility of remote data collection from mobile devices, and the potential of such devices to collect data from large samples for clinical and epidemiological studies.

Poster #18
Presenters: Xidian Sun & Chris Rai
Sponsor: Chad Westphal (Mathematics & Computer Science)
Title: An adaptively weighted least-squares finite element method for elliptic problems with singularities

The overall effectiveness of finite element merits may be limited by solutions that lack smoothness on a relatively small subset of domain. By enhancing norms and/or inner products in the variational framework with weight functions chosen according to a coarse-scale approximation, it is possible to recover near-optimal convergence rates. In the poster, we'll show the adaptively weighted functions we chose and how this improves the result.

Poster #19
Presenters: David Lawhorn & Chris Rai
Sponsor: Esteban Poffald (Mathematics & Computer Science)
Title: On trigonometric functions and matrices

This poster organizes and explores the relationship between matrices, some trigonometric functions, and some trigonometric identities. We give direct verification of commonly used trigonometric identities and give more specific and intuitive definitions for easier computation. We also include an application to systems of ordinary differential equations.

Poster #20
Presenters: Benjamin Washer, Campbell Higbie, & Matthew Bupp
Sponsor: Lon Porter (Chemistry)
Title: Initial studies of metal ion extraction using porous silicon

Porous silicon (*por-Si*) has an incredibly high surface area (often >500 m2/cm3) making it an attractive candidate for a variety of applications including microelectronics, sensors, high-powered batteries, medical diagnostics, and drug delivery systems. Recent work on *por-Si* has also focused on its use in waste water treatment and its ability to draw heavy metal ions out of solution via ligand coordination. The native hydride terminated surface is quite reactive and is able to facilitate the formation of organic monolayers. Ligands can be adhered onto its surface and used to adsorb heavy metal ions. Our initial research, however, has focused more on the ligand properties of simply oxidized *p*- and *n*-type porous silicon and its ability to absorb copper ions (a safe model target metal) out of solution. We have also briefly explored the prospect of recycling the porous silicon samples so that they may be reused to maximize the amount of metal removed from solution and to minimize the amount of resources used.

Poster #21
Presenter: Christopher McGue
Sponsor: Eric Wetzel (Biology)
Title: Worms in snails: The influence of habitat and distribution in two host species in Sugar Creek

Physella gyrina and *Pseudosuccinea columella*, freshwater pulmonate snail species, were collected from three microhabitats (dry, mud, water) along Sugar Creek and dissected to determine the presence of parasitic trematode infection in this water system. Data were collected from the snails such as shell height, infection status (patent or prepatent), and the presence of *Chaetogaster limnaei*, a commensal annelid which lives in the mantle cavity of many snail species. This commensal was found in both species of snail, but with a far greater number in *Physella* than in the *Pseudosuccinea*. The disparity that arises between the number of *Chaetogaster* in the different species mainly reflects the habitat differences between the snail hosts. The majority of the *Physella* were found in the water habitat; the majority of the *Pseudosuccinea* were found in the mud habitat and the dry habitat. Although only 85 *Physella* were collected, nearly 88% possessed *Chaetogaster limnaei*, while the prevalence of *Chaetogaster* in *Pseudosuccinea* (n = 743) was only 0.94%. These differences raise some interesting questions about the behavior of both snails and their interaction with *Chaetogaster* under field conditions.

Poster #22
Presenter: Alex Waters
Sponsor: Amanda Ingram (Biology)
Title: The influence of the extracellular matrix on tendon cell regeneration

Approximately half of all musculoskeletal injuries that occur each year in the United States involve soft tissue, which previous research has shown requires a specialized environment in order for the healing process to start. What remains unknown, however, is how the extracellular matrix influences the regeneration of tendon cells. My research was focused on finding the optimal environment for these cells to divide so that we might be able to build better artificial tendon constructs to heal musculoskeletal injuries. Using fluorescent tendon cells from mice, I was able to track how efficiently they replicated in the presence of various components of the extracellular matrix. Statistical analysis of the collected data revealed that cells exposed to the molecule tenascin-C were prone to higher levels of replication than those exposed to other extracellular matrix components. Tenascin-C is known to have an important role in the healing process of other cells, giving us insight into its potential role of producing more advanced artificial tendons to start a scar-free healing process in the event of a musculoskeletal injury.

Poster #23
Presenter: Billy McManus
Sponsor: Walter Novak (Chemistry)
Title: The role of senescence-associated factor IL-6 in tumor cell recruitment to the bone stroma

Age-related changes in non-tumor cells have become well established as major contributors to the increased incidence of neoplasia in aged humans. Cells no longer capable of division, referred to as senescent cells, have been shown to increase a battery of protumorigenic factors, known as the senscence activated secretory phenotype (SASP). One of the hallmark factors expressed in the SASP is interleukin-6 (IL-6), which we are investigating for its suggested role in tumor cell recruitment, retention, and proliferation to senescent cells in the bone stroma, a common site of metastasis for many cancers. Using immunofluorescence staining of tumor cells and IL-6 expressing senescent cells and a sophisticated mapping algorithm, we aim to quantify the degree to which circulating tumor cells localize in the vicinity of the senescent cells. In future studies an IL-6 neutalization experiment should assess the role of IL-6 in tumor recruitment if tumor cells are shown to localize near senescent cells at a rate greater than chance. Identifying the mechanism underlying metastasis to bone stroma may open paths to effective anti-metastasis treatments. Since metastasis is most often the deadly stage of cancer development, such treatments may ultimately allow cancer to be treated as a chronic disease.

Poster #24
Presenter: Korbin West
Sponsor: Scott Feller (Chemistry)
Title: Variation of trypsin digestion

Protein digestion plays a key role in sample preparation for various analytical instruments such as Liquid Chromatography or Mass Spectrometry. Using solution based trypsin to digest protein samples is common in many labs; however labs use a variety of different methods to digest their samples. Different labs require different levels of accuracy and have cost/time limits, so determining optimal method preparation is of great interest to labs. There are some vital characteristics when preparing trypsin digestions that could possibly change its activity. Firstly, can the grade/type of trypsin used in digestion greatly affect its performance? Secondly, how large of a role does the ratio of trypsin to protein play in decreasing digestion time? Lastly, protein digest are often done in solution. How do different solutions affect trypsin activity? Which solutions are both digestion-optimal and instrument-friendly? In this presentation, the extent of the variation in trypsin activity can be seen based on the grade of the trypsin, its ratio in solution, as well as the solution system used in experimentation.

Poster #25
Presenters: Anthony Milto & Jake Norley
Sponsor: Laura Wysocki (Chemistry)
Title: Improving the efficiency of fluorescein diether cytochrome P450 substrates

Fluorescein diether derivatives are stable masked fluorophores that have been shown to exhibit very low background fluorescence before an unmasking chemical reaction takes place. This makes them ideal candidates as substrates to investigate enzyme activity, as in the case of cytochrome P450. However, the derivatives are not generally very soluble in water and the enzyme oxidation of the ether moiety can be sluggish. To address these issues, we are synthesizing a library of compounds starting from 2',7'-dihalogenated 5-carboxyfluoresceins. Through a common intermediate, we can obtain a variety of diether substrates to investigate cytochrome P450 activity based on fluorescence.

Poster #26
Presenter: Yang Yang
Sponsor: Martin Madsen (Physics)
Title: Anomalous motion of trapped ion microspheres

The initial goal of our experiment was to develop a classical version of the quantum behavior where atoms tunnel through barriers in an optical lattice. Our classical version was based on trapping charged ceramic dust particles in a large two-dimensional ion trap array. The random kicks that the dust particles feel from the air around them, combined with the regular ion trap motion should simulate this quantum behavior. However, we observed unexpected movement of the ions in the trap array, not explained by our models or predictions from other experiments. We present our analysis of this mysterious motion and plans for future experiments modeling the quantum behavior.

Poster #27
Presenter: Mason Zurek
Sponsor: Jeffrey Drury (Rhetoric)
Title: Comedy and tragedy in fraternities

The news media often criticize fraternities for stigmas associated with Greek life such as binge drinking, hazing, and sexual assault. The blame for these tragedies always seems to fall squarely on the fraternity. Yet, news media often use some aspects of comedy to make sense of these tragic events. The contrast between comedy and tragedy are two of the principles frame of Kenneth Burke's dramatism. Using this as a method, I analyzed three differing incidents in fraternities, all of which involved a significant amount of alcohol, to see how news media uses a comic frame in their coverage. I argue that news media use a tragic frame to scapegoat fraternities and fraternity members that is later fixed with a comic corrective to ease blame from the individuals involved. As a campus with a substantial Greek population, I believe this research provides a new insight into fraternity representation in journalism and ways in which we can view news media and use their reach to effectively explain our purposes and goals.

Poster #28
Presenter: Mason Zurek
Sponsor: Sara Drury (Rhetoric)
Title: Community or Catholicism: Georgetown's response to the contraception controversy

During the debate over the Affordable Care Act, the contraceptive mandate became a major point of debate for both sides of the political spectrum. The culmination of this debate was Georgetown Law student Sandra Fluke's congressional testimony in favor of the mandate and her subsequent labeling as a "slut and prostitute," by conservative talk show host Rush Limbaugh. Limbaugh's words began a firestorm of discussion about both the mandate and productive discourse in which John DeGioia, President of Georgetown University, readily joined in defense of a student. Georgetown is a Catholic University known widely for its liberal beliefs including allowing pro-choice groups on campus. To support Catholic teaching on contraception, the school must be against the use of contraceptives; yet, DeGioia did not focus on this in his responses to the controversy, instead supporting Fluke's right to free speech. Through the use of ideological criticism I analyze two letters from DeGioia and discuss how each places the Georgetown community's pro-choice ideals above Catholic identity. DeGioia marginalized the school's Catholic identity and supported its community's pro-choice beliefs throughout the contraceptive debate.


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