3-4-2016

2016 Program: Honors Student Symposium

University of Dayton. University Honors Program

Honors Students Symposium 2016

arts business education engineering sciences

UNIVERSITY of DAYTON

Honors Program

The thesis component of the Honors Program
consists of a three-semester, six-credit-hour project
that culminates in a significant research contribution,
performance, or body of creative work.

The Honors thesis project involves a collaboration
with one or more faculty members
who help direct and focus the student's original thesis topic.

The University Honors Program
sponsors the Honors Students Symposium
as an opportunity for the students to present their theses
to the University community, family and friends.

UNIVERSITY of DAYTON

University Honors Program

presents the

Honors Students Symposium 2016

March 4, 2016
1:00 to 5:00 p.m.
Kennedy Union

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special awards

The Patrick F. Palermo Honors Program Founders Fund

provides support for substantive Honors thesis projects "that involve international research, service and leadership in the community, or which advance the realization of a just society."

The awardees for 2015-16 are
Krista E. Bondi, Elizabeth A. Brumleve, Kara M. Jankowski, Margaret A. Maloney, Samuel A. Mullins and Dominic R. Sanfilippo

The Daniel Arnold Memorial Scholarship

provides a senior-year scholarship for an Honors student from the College of Arts and Sciences who exemplifies Danny Arnold's commitment to research by completing a thesis project.

The awardees for 2015-16 are
Claire C. Konys and Maxwell J. Roeske

The Berry Summer Thesis Institute

engages a cohort of mid-career Honors students with records of academic success and an interest in research in a 12-week on-campus program. Thesis students present their research-in-progress at the Honors Students Symposium during their junior year and their final projects as seniors.

The members of the 2016 cohort will be announced at the Honors Reception on March 4, 2016

1:00 p.m.

Jonathan D. Ashbrock

Majors: Computer Science / Mathematics

1:00 p.m., Room 311
R. Sritharan, Ph.D., Thesis Advisor
Computer Science Department

Recognition Algorithms and a Boxicity Bound on a Class of Chordal Graphs

In Mathematics a graph is an object consisting of points (vertices) and lines (edges) connecting these points. These objects may be used to model any event where we wish to study the structure of a network (computer, social, etc.) by examining the connections. An important class of graphs are called the interval graphs. These graphs, in a sense, are those that are approximately linear in shape. Applications of these include scheduling problems and resource allocation in operations research. My thesis introduces two polynomial time algorithms to recognize a more general class of graphs related to these interval graphs. I also develop a bound on a parameter known as Boxicity for this class of graphs.

Joseph B. Ferber

Major: English

1:00 p.m., Room 312
Thomas L. Morgan, Ph.D., Thesis Advisor
English Department

Indigenous Poetics: Re-defining the Discourse of Post-Colonialism

This three-chapter project explores the work of three poets, each identifying with different North American indigenous tribes. Their work challenges western poetic conventions and notions of individualism to offer alternative worldviews and complicate mainstream oversimplifications of American Indian identity. Brandi MacDougall investigates assumptions of the Western Self represented by the "I" Perspective common in Western thought; Sherman Alexie revises the sonnet form to portray the complexity of how contemporary American Indians navigate the blending of capitalist institutions and native traditions; Kristi Leora offers readers an enlightened conception of self-hood by balancing processes of western socialization with native cosmology. Ultimately, this project is a student's dive into the shallow waters of a deep, perhaps infinite pool of understanding and existence that can never be fully learned, understood or experienced from his personal, subjective perspective.

George M. Iannantuono

Major: Biology

1:00 p.m., Room 310
Karolyn M. Hansen, Ph.D., Thesis Advisor
Biology Department

One Signal, Two Behaviors: Odor Discrimination in Unmated versus Mated Female Green Bottle Flies, Lucilia sericata

Lucilia sericata, the green bottle fly, is an organism of interest in the fields of forensic entomology since it is one of the first fly species to colonize a fresh carcass and is therefore used for post-mortem interval (PMI) assessments, or time since death. Females and males use the carcass for different functions. It has been postulated that males use the carcass for a small protein meal and for finding and mating with females. The females are known to use the carcass for feeding (unmated females) and egg-laying (mated females). The volatile odor associated with a carcass is a complex suite of chemicals. Given the two very different behaviors displayed by females, this research proposal focuses on whether unmated versus mated females are responding to the same odor cues or if unmated (feeding) females respond to a set of odor cues that is different from those that attract the mated (egg-laying) females. The existence of two very different behaviors could likely be the result of up or down regulation of expression of proteins associated with olfactory sensing in these flies. This thesis will explore the olfactory response of unmated versus mated female flies exposed to volatiles associated with decaying carrion.

Morgan E. Pair

Major: Psychology

1:00 p.m., Room 331
Robert Crutcher, Ph.D., Thesis Advisor
Psychology Department

The Effectiveness of Active Interaction in Interactive Visual Imagery as Created by the Keyword Method

Mnemonic devices have been proven to be extremely effective methods for learning and subsequent retention of information. In recent years, as our country becomes more multicultural and the need for bilingualism increases, mnemonic devices have been increasingly utilized in foreign language learning. One of the most effective mnemonic devices being used in this way is the keyword method. The keyword method uses paired-associate learning and visual imagery to more strongly encode the English and foreign word pairs (Raugh & Atkinson, 1975). Recent research has shown the effectiveness of visual imagery increases when there is an interaction shown between the paired words (Crutcher, 1990). However, there have not been any sufficient investigations into what aspect of the interactive visual imagery makes it so effective for learning and retention. This study sought to answer this question by investigating the nature of the interactions used to relate the English translation and keyword mediator pair.

1:20 p.m.

Donald J. Kleppel

Major: Biology

1:20 p.m., Room 310
Karolyn M. Hansen, Ph.D., Thesis Advisor
Biology Department
Douglas C. Hansen, Ph.D., Thesis Advisor
Materials Degradation And Electrochemical Engineering, UDRI

Distribution of Shell Formation Proteins in Oyster Hemolymph, Hemocytes and Mantle Tissue

The goal of this project is to gain insight into the process of shell formation and regeneration in *Crassostrea virginica*, the Eastern oyster. A group of proteins that are responsible for the creation of the shell are the L-DOPA proteins. The exact origin and composition of the L-DOPA proteins in the biomineralization process is currently under debate in the scientific community. This research will specifically analyze the origin and composition of these proteins in oyster shells. This will be accomplished by notching the oyster shell using a tile saw (mimicking a predation event) that will induce new shell formation. Once notched, we will be sampling the proteins in the shell by extracting hemocytes, hemolymph and mantle tissue near the site of damage in the shell. Proteins will be extracted from the shell immediately after induction of the notch and during regular time intervals throughout shell reformation using amino acid analysis.

Alicia A. Linzmeier

1:20 p.m., Room 222

Majors: Criminal Justice Studies / Political Science
Berry Summer Thesis Institute 2015 Presenter

Arthur J. Jipson, Ph.D., Thesis Advisor
Criminal Justice Studies Program

The Promise of Justice: Are Public and Private Defense Equal?

This thesis will attempt to uncover whether or not public defense lawyers and private defense lawyers achieve the same or similar results for their clients facing serious felony charges in southwestern Ohio. The outcomes of interest are conviction rates, guilty plea rates, incarceration rates, and sentence lengths. Though people facing equally serious charges should receive roughly equal outcomes, this is not always the case. Existing literature suggests that some of the differences could be dependent on the type of lawyer that a defendant has, or whether or not he or she can afford to pay for his or her own representation. Future research will examine if these differences manifest themselves in six counties in southwestern Ohio by studying unclassified and first degree felony cases that have been filed since January 1, 2000.

Samuel A. Mullins

1:20 p.m., Room 312

Majors: Religious Studies / Spanish

Meghan Henning, Ph.D., Thesis Advisor
Religious Studies Department

Typology, Tabernacle, and Tradition: A History of Interpretation of Hebrews 9:11-14

The texts of the Bible have been used and interpreted in various ways across different time periods and different cultures, and there is much to be gained by studying these changes. Changing attitudes about and uses of Scripture tell us something about other changes taking place in society. They reflect new ideas about religion, knowledge, and authority. The purpose of my study is to use Hebrews 9:11-14 to look at the ways in which the interpretation of Scripture and the uses of Scripture change across time and geographic locations. I will do so by analyzing the text itself in its first century context, as well as documents citing this passage from the Early Church, the Middle Ages, the Reformation and the present day. The latter category will include peer-reviewed scholarship, as well as the use of the passage in explicitly theological works.

Mackenzie L. Wilson

1:20 p.m., Room 211

Major: Exercise Physiology

Betsy K. Donahoe-Fillmore, Ph.D., Thesis Advisor
Department of Physical Therapy

The Use of the Bruininks-Oseretsky Test of Motor Proficiency and the Y Balance Test to Assess Balance in Typical Children Ages 6-10 Years

One of the most commonly used tests to measure balance is the Bruininks-Oseretsky Test of Motor Proficiency(BOT-2) subtest. With this balance assessment, a ceiling effect is often seen in the pediatric population, resulting from the children being able to complete the entire test. This effect makes it challenging to assess changes in balance before and after intervention for many children. The Y-balance test is another balance measurement, but normative data for this test has not been established for the pediatric population. The purpose of this study is to develop normative values for the Y Balance Test in typical children ages 6 to 10 years and to compare to the BOT-2 standardized score for each age group. Results of this study can be used to discover normative balance values in children of this age group and also determine if the Y Balance Test can be utilized to accurately assess balance in the pediatric population.

1:40 p.m.

Alison R. Cozad

1:40 p.m., Room 222

Major: Political Science

Nancy Miller, Ph.D., Thesis Advisor
Political Science Department

State Initiatives, Public Knowledge and the Media

In the November 2015 election, Ohio saw an increased amount of media attention to one specific ballot initiative: Issue 3. While many people were tuned into this issue, many also failed to notice the other two initiatives on the ballot. This sort of conundrum is what this thesis will be studying. Looking at media coverage of ballot initiatives across the nation, it could be possible to link media with voter efficacy, voter turnout and how knowledgeable voters were on the issues. Doing this can help identify if voters are tuned into state and local issues and if media has a role to play in informing the public of these ballot initiatives.

Elijah C. Kuska

1:40 p.m., Room 207

Major: Mechanical Engineering

Allison Kinney, Ph.D., Thesis Advisor
Mechanical and Aerospace Engineering Department

Investigation of Muscle Coordination Strategies Used to Simulate Walking

The knowledge of forces in muscles and joints inside the human body may help to improve rehabilitation for individual patients. However, the human body is complex and these forces are unmeasurable. Through the use of motion capture technology, 3D modeling, and computational methods in the field of biomechanics we are able to simulate motion by predicting these forces. One challenge to biomechanical simulation is that we do not understand the strategy humans use to coordinate their muscles to walk. The purpose of this study was to examine muscle coordination strategies used to simulate walking. Different muscle coordination strategies are attained in a simulation by altering a quantity called the objective function. Simulation output data can be compared between strategies and to experimental data to determine the strategy that best represents human muscle coordination. In the future this knowledge may be applied to rehabilitation techniques: changing them from generalized to patient-specific.

Sarah A. Stalder

1:40 p.m., Room 310

Major: Biology

Jeffrey Kavanaugh, Ph.D., Thesis Advisor
Biology Department

The Effects of Low Dam Removal and Kayak Run Installation on the Biodiversity of Fish and Macroinvertebrates in the Great Miami River in Downtown Dayton, Ohio

In the past few years Five Rivers Metroparks and Miami Conservancy District have made plans to remove the upper portion of the Monument Avenue low-head dam in downtown Dayton due to the hazard it poses for recreation on the river and its negative impact on water quality and biodiversity. The proposal also includes the addition of a kayak course. The proposed changes should improve water quality and biodiversity by returning the river channel to a more natural state. The goal of this project is to analyze the effects of low dam removal on macroinvertebrate and fish communities by measuring the communities before and after low dam removal.

Jamie L. Wynk

Major: PrePhysical Therapy

1:40 p.m., Room 211

Kurt Jackson, Ph.D., PT, GCS, Thesis Advisor
Department of Physical Therapy

Fall Risk Assessment of Older Adults Participating in Adult Day Services

Elderly individuals, especially those with dementia, have been shown to be at an increased risk for falls and loss of mobility. These falls can lead to broken bones which often require long rehabilitation times and can leave the individual at a decreased capacity to live an independent life. The primary purpose of this research was to assess the balance and mobility of individuals participating in adult day service programs. To be included in this study, participants had to attend Goodwill/Easter Seals adult day programs in the Miami Valley. Participants were screened for their level of cognition. Testing assessed upper and lower body strength, walking speed, and balance. This data will be helpful in designing future interventions such as exercise and educational programs to meet the needs of this specific population.

2:00 p.m.

Brian D. Bates

Majors: Finance / Operations Management

2:00 p.m., Room 311

Trevor C. Collier, Ph.D., Thesis Advisor
Economics and Finance Department

E-commerce's Effect on Big-box Retailers

With electronic commerce, or e-commerce, now at 71 billion or 6.2% of total retail in the first quarter of 2014 and growing at a pace of 15% annually as compared to 2.4% for all of retail, e-commerce is quickly gaining ground on the overall market. (U.S. Census Bureau, 2014) These numbers do not necessarily mean that retail as a whole is exploding, but rather transforming. From mom and pop specialty stores, to catalogues, to department stores, to big-box retailers, e-commerce is the next stage of development. My thesis project attempts to quantify how e-commerce is affecting big-box retail by looking at their year over year square footage growth rates of their stores as well as the percentage growth of their stocks. I am asking two questions: (1) As more products are sold online in a retail category, are big-box retail stores growing or shrinking in size? (2) Also are the stocks in that retail category performing better or worse as more products are sold online? I will analyze these two questions by building two different statistical models that are described in my abstract.

Michael J. Hudock

Major: Biology

2:00 p.m., Room 211

Anne R. Crecelius, Ph.D., Thesis Advisor
Department of Health and Sport Science

Effect of Combination Ice and Compression Socks on Resting Calf Blood Flow in Trained Male Athletes

Compression socks are common tools that are utilized in the realm of athletics. The purpose of the compression is to increase blood flow to the lower extremities, thereby increasing oxygen and energy sources needed for increased skeletal muscle function and/or recovery. Recently, a product has been marketed that combines the compression element and with cryotherapy, the goal being increased blood flow to the lower extremities while reducing inflammation post-workout to quicken recovery. However, to our knowledge, direct measures of blood flow using this type of product have not been performed. Thus, this study looks at the effects of compression with and without cryotherapy (e.g. icing) on the blood flow of trained male athletes. The hypothesis was that compression would increase blood flow, ice would reduce it, and a combination of both would produce an intermediate result.

Anam Hussain

Major: Biology

2:00 p.m., Room 310

Madhuri Kango-Singh, Ph.D., Thesis Advisor
Biology Department

Drosophila Models to Investigate the Role of Regulation of Cell Death in Development and Cancer

Normal cells become cancerous through progressive modifications usually introduced during DNA replication which lead first to rampant proliferation, and if unchecked, invasion and metastasis to distant sites. In normal cells, specialized response elements exist which triggers apoptosis in the event of serious damage to a cell's genome. The Hippo Pathway is a major pathway in apoptosis, which regulates the proliferation and survival of cells in *Drosophila*. When the Hippo pathway is active, Dronc, a cell death-causing gene, is inactive. Specifically, Dronc acts via the assembly of an apoptosome, which is made through the binding of Dronc to another apoptosis regulating protein, Dark. The goal of this project is to understand what the loss of Dronc, Drice, or Dark does to cell division genes. This research will bring to light the behind-the-scene mechanisms that may indicate tumor beginnings due to the lack of expression, or over-expression, of certain mutant genes that normally regulate cell death.

Taylor M. Schemmel

Major: Mechanical Engineering

2:00 p.m., Room 207

Kimberly E. Bigelow, Ph.D., Thesis Advisor
Mechanical and Aerospace Engineering Department

Nonlinear Analysis of Fall Risk in Older Adults with Dementia

81.1 million adults are expected to be affected by dementia by 2040. Individuals with dementia are twice as likely to fall as healthy individuals and three times as likely to sustain an injury during a fall. Falls are caused by many things, however, balance deficiencies represent a significant controllable factor of fall risk. The objective of this study was to examine balance differences between individuals with dementia who fell often and individuals with dementia that did not. People using the Easter Seals Adult Day Services participated in this study. A fall history and balance assessment was done for each individual that was willing and able to participate. It is hoped that this information can provide clinicians and caretakers with a better sense of balance limitations in individuals with dementia and contributes to the larger goal of developing preventative measures to positively impact the number of elderly falls each year.

2:20 p.m.

Patrick C. Doyle
Majors: Psychology / Communication

2:20 p.m., Room 331
Lee J. Dixon, Ph.D., Thesis Advisor
Psychology Department

Model Behavior: An Assessment of Role Model Attachment

Despite the term being around since 1943 when Robert Merton first described relationships to reference groups, role model relationships have not been frequently studied in the field of psychology. Using attachment theory, which is a cornerstone of interpersonal relationship psychology, this study aims to learn more about the types of relationships people have with their role models.

Angela N. Giaquinto
Major: Biology

2:20 p.m., Room 310
Ryan McEwan, Ph.D., Thesis Advisor
Biology Department

Biodiversity, Ecosystem Function and the Pollination Ecology of Urban Gardens in Dayton, Ohio

The purpose of this project was to create a better understanding of pollinators specifically within the city of Dayton, Ohio. With the urban landscape differing greatly from pollinators 'natural' habitat we hoped to find the answer of how different landscapes within a city affect pollinator behavior. By comparing a grassy field located just outside of city limits in Kettering, Ohio, to abandoned lots and urban agriculture sites in the city we were able to discover the relationship between the city lots and pollinators.

Genevieve M. Kocoloski
Major: Exercise Physiology

2:20 p.m., Room 211
Anne R. Crecelius, Ph.D., Thesis Advisor
Department of Health and Sport Science

Effects of Single-Dose Dietary Nitrate on Oxygen Consumption During and After Maximal Exercise in Healthy Humans

Aerobic exercise is an important factor in combating the health issues brought on by the widespread presence of cardiovascular disorders. When one engages in aerobic exercise, there is an increase in oxygen demand in the body. Therefore, as one expends more energy, the amount of oxygen needed by the body increases. It has been suggested that organic nitrate supplements in the form of beetroot juice decrease the amount of oxygen needed to perform a particular bout of exercise, possibly increasing one's efficiency during exercise. However, there is a lack of published data regarding the effect of dietary nitrate supplementation on EPOC, or excess post-exercise oxygen consumption. This study will show the effect of beetroot juice on oxygen consumption during and after maximal bouts of exercise in healthy humans. The results will reflect just how effective beetroot juice is on the efficiency of oxygen consumption.

Kara A. Lamantia
Major: Geology

2:20 p.m., Room 311
Umesh Haritashya, Ph.D., Thesis Advisor
Geology Department

Surface Temperature Estimation of Debris-covered Peruvian Glaciers Using Thermal Remote-sensing Imagery

With the current climate changes the Earth is experiencing, there is a noticeable retreat of the glaciers that exist on the Earth. Tropical glaciers in Peru are an important resource to the people who live there and depend upon them for farming, consumption and hydro-electrical power resources. Due to the steady and rapid retreat of these glaciers, the people of Peru could potentially loose this valuable resource significantly in the next few decades. Using both the ERDAS Imagine and Arc GIS programs the surface temperature of Peruvian glaciers can be analyzed for how surface debris affects the retreating glaciers and what kind of seasonal and annual temperature variations these glaciers possess.

Devin W. Spatz
Major: Electrical Engineering

2:20 p.m., Room 207
Guru Subramanyam, Ph.D., Thesis Advisor
Electrical and Computer Engineering Department

Design and Fabrication of a Passive Barium Strontium Titanate (BST) Thin-Film Varactor-Based Phase Shifter for Operation within a 5-15 GHz Bandwidth

Enabling next generation radar and telecommunications systems requires increasingly more complex electronic components. In order to enable high performance, these components need to have low power loss, quick switching times between device states, and high device state accuracy. One essential component, called a phase shifter, allows for the phase angle of an electrical signal to be "shifted" relative to the input, or reference, phase angle. The ability to rapidly shift the phase angle of electrical signals enables these systems to encode information onto signals as well as to focus, or steer, the electromagnetic waves that they emit. This project developed a phase shifter which utilizes Barium Strontium Titanate (BST) thin films in order to have a tuning capability that allows for the adjustment of the phase shift angle. Through simulation, fabrication, and testing, this project studies the feasibility of using BST to achieve all of the qualities desired in a phase shifter and improve on existing designs.

Sarah E. Spech
Major: English

2:20 p.m., Room 312
Susan Trollinger, Ph.D., Thesis Advisor
English Department

"Instafamous" Women and the Question of Empowerment: A Feminist Reading of Popular Constructions of the Female Body on Instagram

Instagram has skyrocketed in popularity over the last few years, catapulting some of its users into a new type of fame — "Instafame." Female users who achieve "Instafame" do so in large measure by carefully constructing an identity that articulates a popular ideal of the female body. Many commentators see this presentation of self as a new means of empowerment. But others argue that these "Instafamous" women are pressured to objectify themselves in order to accumulate the thousands of "likes" necessary to create and sustain their celebrity status. In this presentation, I analyze the images on some popular Instagram accounts using the feminist work of Kate Millet.

2:40 p.m.

Anastasia Bjelopetrovich

2:40 p.m., Room 211

Major: Exercise Physiology

Joaquin A. Barrios, DPT, Ph.D., Thesis Advisor
Department of Physical Therapy

Effects of Body Weight Loading on Arch Height

The effects of progressive body weight loading on arch height of the foot were studied. This study was performed to see how and if the arch of the foot flattens out when the body is placed under different weight conditions. The subjects' arch height was measured at twelve different body weight measurements of 10% increments ranging from 10% of their body weight up to 120%. The subject's were also loaded with a weighted vest that contained 20% of their body weight in order to aid them in achieving the higher loads of weight. The Arch Height Index measurement system was used to gain all the foot measurements for the study. This will further the understanding of how the foot and specifically the arch change during ambulation. It can be applicable to orthotics, shoe development and arch supports.

Patrick J. Dugan

2:40 p.m., Room 311

Major: PreMedicine / Psychology

Mark B. Masthay, Ph.D., Thesis Advisor
Chemistry Department

Photodegradation of β-Carotene in the Presence of 1°, 2° and 3° Organic Radicals

β-carotene (βC; C40H56), a natural orange pigment that absorbs ambient light corresponding to wavelengths in the violet, blue, and green portions of the visible spectrum, is found in the leaves of many green plants, and in "yellow" fruits and vegetables, such as oranges, carrots, and squash. βC is incorporated into the human body — where it plays an important antioxidant role by quenching free radicals and reactive oxygen species (ROS), thereby protecting tissues with low oxygen concentrations from oxidative damage — through dietary means.

This research project is designed to specify (1) how βC interacts with light-induced 1°, 2° and 3° free alkyl radicals in biological systems by measuring photodegradation rates of solutions of βC dissolved in various alkane solvents, and (2) how the antioxidant/prooxidant properties of the resulting products differ from those of βC, which was determined by measuring photodegradation rates of various solutions. The ultimate objective of the project is to help identify the specific βC photoproducts responsible for suppression of the immune system induced by ultraviolet (UV) light.

Peter J. Ogonek

2:40 p.m., Room 207

Major: Civil Engineering

Denise G. Taylor, Ph.D., P.E., Thesis Advisor
Civil and Environmental Engineering Department

Phosphorus Adsorption through Biochars Produced from Organic Waste Products

This thesis looks at the potential for agricultural and other industrial wastes to be used in preventing fertilizer runoff from entering lakes and streams, causing problems with delicate ecosystems. Corn stalks, cork, and sawdust were put through a simple process and tested for capacity to remove phosphorus, a major contributor to fertilizer-based pollution, from water.

Dominic R. Sanfilippo

2:40 p.m., Room 312

Majors: Philosophy / Human Rights Studies

V. Denise James, Ph.D., Thesis Advisor
Philosophy Department

Trauma and Identity: A Philosophical Approach to Justice in Catholic Communities

Trauma can be inflicted on a person's identity through the denigration of sex, gender, sexual orientation, race, ethnicity, religion, or beliefs, among many characteristics. Trauma is not always visible on the outside and can often go ignored. Many disciplines have contributed to the evolving understanding of trauma, including psychology, anthropology, sociology, and cognitive science. Trauma can damage a person's emotional life, trigger psychological phenomena like flashbacks and hallucinations, and can even spur physical symptoms like migraines and weight fluctuation. Philosophy offers us the opportunity to ask the question: what should we be doing to create the conditions of justice in communities where people have experienced trauma? In this thesis, I will use philosophy to propose ways that we can ameliorate the injustices of trauma in civic, religious, and social settings. By examining historical and current philosophical questions around identity and the self in relation to justice, I hope I will be able to begin to articulate particular ways we can create more just communities for people who identify as LGBTQ Catholics.

Jonathon P. Sens

2:40 p.m., Room 310

Major: Biology

Pothitos M. Pitychoutis, Ph.D., Thesis Advisor
Biology Department

Dissecting the Sex-dependent Neurochemical Effects of the Rapid-acting Antidepressant Drug Ketamine with In Vivo Brain Microdialysis in Mice

Major depression is a debilitating disorder that affects nearly 350 million people worldwide, resulting in a significant public health burden. Currently marketed antidepressant drugs typically take weeks to elicit their therapeutic effects. However, it was recently shown that the psychedelic drug ketamine may induce rapid (within two hours) and long-lasting (up to one week) antidepressant effects in both human patients and in animal models of depression. Strikingly, women suffer from major depression at nearly twice the rate of men and respond differently to commonly used antidepressant treatments. However, research regarding the neurobiological effects of ketamine has focused almost exclusively on the male sex. The aim of this honor's thesis was to advance our knowledge on ketamine's sex-differentiated neurochemical effects in mice using in vivo brain microdialysis and immunoblotting assays. Taken together, our data provide valuable insights into the neurobiological mechanisms pertaining to the sex-differentiated antidepressant-like effects of ketamine.

Joshua D. Tovey

Majors: Political Science / Philosophy

2:40 p.m., Room 222

David Watkins, Ph.D., Thesis Advisor
Political Science Department

Is There Room for God in the Universal Declaration of Human Rights?

In today's world the Universal Declaration of Human Rights is one of the major moral codes of the world. It is quoted by the media, politicians, professors and students both secular and religious, yet the whole time the document does not have a clear metaphysical foundation. This begs the question "Is there room for God as the foundation of the UDHR?" Through research on the history of the drafting of the document and an examination of the philosophical writings of the drafters this question hopes to be fully examined.

Alejandro Trujillo

Major: Psychology

2:40 p.m., Room 331

Erin O'Mara, Ph.D., Thesis Advisor
Psychology Department

Can the Color Red Improve Men's Perceived Mate Value? Examining the Interactive Effects of Facial Masculinity and Color on Female Evaluation of Potential Mate

This study merges two previously separate lines of research which have demonstrated that the color red (1) increases ratings of attractiveness when paired with a human face or as an article of clothing and (2) is associated with higher status in both humans and non-human species. Female participants were asked to evaluate a male face on their perception of the man's status, as well as attraction to the man. The face was manipulated to appear more masculine or feminine (masculine faces have been demonstrated to be associated with higher status and stronger genes) and presented on a red or white background. Results from two experiments suggest that pairing masculine and--more importantly--feminine faces with the color red indirectly increases perceived attractiveness though an increase in perceived social status. Further, this effect is particularly strong for women nearing peak fertility.

3:00 p.m.

Sydney M. Antolini

Major: Dietetics

3:00 p.m., Room 222

Diana Cuy-Castellanos, Ph.D., Thesis Advisor
Department of Health and Sport Science

Effects of a Peer-Developed Nutrition Education Intervention on the Fruit and Vegetable Intake in Elementary School Children

The Center for Disease Control estimates that nearly one in three children in the United States are overweight or obese. Additionally, childhood obesity has nearly doubled in children in the last 30 years and tripled among adolescents. While there are many factors that influence this significant increase, school systems and school cafeterias may be a contributing element to this issue. While many schools are working to provide healthier options (namely fruits and vegetables) in their cafeterias, most children are throwing away, or not even choosing, the healthier options. The purpose of this study is to examine a peer developed nutrition education intervention that aims to increase fruit and vegetable intake in students. Through collaboration with a sixth grade student, awareness of the issue is directly addressed and different methods are explored in attempts to close the gap between fruit and vegetable consumption and disposal.

David C. Bell

Major: Mechanical Engineering

3:00 p.m., Room 207

Andrew P. Murray, Ph.D., Thesis Advisor
David Myzska, Ph.D., Thesis Advisor
Mechanical and Aerospace Engineering Department

Design and Prototyping of a Variable Geometry Extrusion Die to Exhibit Significant Alteration of Shape

Extruded parts are conventionally made by forcing melted plastic through a steel die having a fixed opening that matches the shape of the part. Plastic parts made by extrusion include weather stripping, PVC pipe, and composite lumber. Variable geometry dies can change their opening shape during the extrusion process. Shape-changing die technology offers the possibility of making parts with varying cross-sections that currently need to be made through injection molding. This is desirable as, compared to molding, extrusion tends to be faster and less expensive. Variable Geometry extrusion dies have been designed and prototyped by the University of Dayton research team that confirms the validity of the concept. This research explores the limits of this new technology by creating a die that has substantial movement of components that form the die opening.

Matthew D. DeVilbiss

Major: Mathematics

3:00 p.m., Room 211

Lynne Yengulalp, Ph.D., Thesis Advisor
Mathematics Department

Domain Representability and Topological Completeness

When talking about a mathematical space, we often want to characterize the completeness of the space. Intuitively, this refers to the existence holes in a space. The real line is considered complete because it has no holes while the rational line is very incomplete because it has holes — namely at every irrational number. In this thesis, we examine the methods by which we measure completeness focusing specifically on the completeness property called domain representability.

William G. Duritsch

3:00 p.m., Room 310

Major: Biology

P. Kelly Williams, Ph.D., Thesis Advisor
Biology Department
Patrick Lyons, Ph.D., Thesis Advisor
Council on International Educational Exchange Research Station, Bonaire

Finding a Correlation between Zooplankton Abundance and the Aggregation of Abudefduf saxatilis *(Sergeant Major Damselfish) Beneath Boats*

Abudefduf saxatilis, or sergeant major damselfish, is a common reef fish in the Caribbean and western Atlantic Ocean. *Abudefduf saxatilis* is known to form large groups called aggregations while feeding on zooplankton. Zooplankton are known to move in the water column in the presence of ultra violet radiation. Beneath boats along the coast of Bonaire, aggregations of *A. saxatilis* have been observed, the reasoning for this occurrence had not been examined previously. The abundance of zooplankton was estimated beneath boats as well as in the open water. Both the abundance and bite rates of *A. saxatilis* were estimated beneath boats that corresponded to the estimates of zooplankton abundance. In addition, the bite rates of *A. saxatilis* were estimated in the open water. It was found that both zooplankton abundance and bite rate were significantly greater beneath boats. There was also a correlation between an increasing zooplankton abundance and number of individual *A. saxatilis* present beneath a boat.

Amanda C. Ferrante

3:00 p.m., Room 331

Major: Psychology

Erin O'Mara, Ph.D., Thesis Advisor
Psychology Department

Examining the Protective Effects of Self-Positivity on Information Avoidance

The phrase “ignorance is bliss” is an idiom frequently used to explain why people avoid information. While at times it might seem like bypassing available information would help avoid pain or conflict, one is also potentially bypassing insight, comfort, or an opportunity to make a change that would be beneficial in the future. According to previous research, feeling positively about the self on a dimension unrelated to a potential threat increases willingness to face a threat to the self. Less is known, however, about whether people are more or less likely to face a threat to the self when they feel positively about the self on the potentially threatening dimension. This thesis tests whether thinking positively about the self on a dimension that has the potential to provide threatening feedback makes people feel more like to face a self-threat.

Jordan T. Watson

3:00 p.m., Room 311

Major: Geology

Daniel Goldman, Ph.D., Thesis Advisor
Geology Department

Global and Regional Chitinozoan Biodiversity Dynamics in the Ordovician: Relationships to Sea-Level, Carbon Cycling and Tectonics

Fossil species provide extensive information about the past history of life on Earth. This thesis focuses on the global and regional biodiversity dynamics of the extinct fossil group Chitinozoa, and analyzes the impact and influences of sea-level, global carbon cycling and tectonics on their biodiversity. Using the automated graphic correlation computer program CONOP9, Chitinozoan stratigraphic range data from fossil species that were collected on several ancient continents (Baltica, Laurentia, and Gondwana) was combined and analyzed to create both regional and global biodiversity plots. These biodiversity plots were then compared to existing sea-level and carbon isotope excursion curves to examine the relationship between environmental change and Chitinozoan biodiversity.

3:20 p.m.

Michael J. Bender

3:20 p.m., Room 222

Major: Political Science

Joshua D. Ambrosius, Ph.D., Thesis Advisor
Political Science Department

Preachers, Politics, and the Pulpit: The Influence of Church Structure on How Clergy Approach Political Topics and How Congregations Receive Their Messages

Using a combination of information gathered through interviews with various Christian clergy and data retrieved from a Pew Research Center survey, I study the influence of church structure on how clergy approach political issues and how congregations receive their messages. I use the specific subject of President Obama's contraceptive mandate to see if any correlation exists between the church structure of certain Christian denominations (e.g. the Catholic Church is centralized and hierarchical while the Assemblies of God is decentralized and congregational) and whether or not clergy from those denominations that I interviewed chose to address the mandate from the pulpit. Additionally, I analyze a survey done by the Pew Research Center to find out if there is any difference between how Catholics, Evangelical Protestants, and Mainline Protestants view the mandate.

Alexandra M. Hallagan

3:20 p.m., Room 310

Major: Biology

Berry Summer Thesis Institute 2015 Presenter

Thomas M. Williams, Ph.D., Thesis Advisor
Biology Department

CRISPR CREam for Fruit Flies: Developing a Genome-Editing Approach to Study the cis-Regulatory Elements that Control the Activities of Genes

Animal genomes possess over ten thousand genes and the number of cis-regulatory elements (CREs) controlling their utilization is perhaps ten times as numerous. Moreover, animal diversity has been prominently shaped by changes in these CREs. Thus, understanding the function of CREs and their evolutionary modification is necessary to grasp how animals develop and evolve. An ideal genetic approach to study CREs is to remove and then replace them with a variant CRE to see how development changes. However, a feasible method does not exist to study the numerous CREs and their variant forms. My thesis will develop an approach to delete CREs from a fruit fly genome and subsequently replace them with variant forms by combining the CRISPR/Cas9 system with recombination mediated cassette exchange. Success here will provide a powerful genetic capability for future research in various species and perhaps inspire ways to treatment human genetic disorders.

Gurjot Kaur

3:20 p.m., Room 311

Major: Economics / Finance

Marc A. Poitras, Ph.D., Thesis Advisor
Economics and Finance Department

Cultural Continuity from 1945 to the 2008 Presidential Election

In a 1968 study, political scientist Walter Dean Burnham found evidence of a surprising correlation between county-level voting in New York and Pennsylvania in the presidential elections of 1860 and 1964. In elections separated by more than 100 years, the counties most likely to vote for civil rights were those originally settled by Yankee migrants from New England. The long-standing Yankee support for civil rights reflected a distinctive facet of Yankee culture that emphasized social improvement through activism and reform. My thesis extends Burnham's analysis by examining the historic presidential election of 2008. I assess the Yankee contribution to the culture of each New York county by using the percentage of the county's 1845 population that was born in New England. The research further supports the significant relationship between regional culture and voting patterns. Regional culture seems to persist despite significant turbulence, maintaining consistency amidst the change that accompanies innovation and progress.

Stephanie M. Loney

3:20 p.m., Room 312

Majors: English / Spanish

Albino Carrillo, MFA, Thesis Advisor
English Department

Modern Maturation: Coming of Age in American Society

Although the coming-of-age story is an important literary genre in many societies and time periods and the basic structure remains constant, cultural factors shape the details of each individual story, making them all unique. As the paradigm dictates, the stories that I will write will focus on a singular main character as she develops from childhood into adulthood, cataloguing in particular the struggles that she must face to reach the end goal of maturation; however, the contemporary issues involved will allow for a distinct perspective.

My thesis project will take the form of a short story cycle that follows Abigail Holden from the end of her high school career through her matriculation in and completion of college. The stories will focus on her transition from childhood into adulthood, and I will emphasize the ways in which the American Dream affects this process as well as the personal and social choices that she must make. In these short stories, I will utilize the techniques outlined in fiction writing guides, such as John Gardner's *The Art of Fiction*. To introduce the collection of stories, I will compose an essay that identifies and addresses the major themes of the coming-of-age story. Further, I will include short quotes from classic American Dream and coming-of-age literature, such as J.D. Salinger's *The Catcher in the Rye* and *Franny and Zooey*, *The Great Gatsby* by F. Scott Fitzgerald and *The Adventures of Tom Sawyer* by Mark Twain, between each story in order to highlight important themes, ideas, and formal concepts of short stories. Through linking these ideas together, I hope to produce an end product that conveys what it is like to grow up and find oneself in American society today.

Tyler M. Masthay

3:20 p.m., Room 211

Majors: Mathematics / Computer Science

Berry Summer Thesis Institute 2015 Presenter

Paul W. Eloe, Ph.D., Thesis Advisor
Mathematics Department

Fractional Analogue for an Existence Result for a Two-Point Boundary-Value Problem

Try to draw the following function on paper defined by f(x)=0 whenever x is rational and f(x)=1 whenever x is irrational. The informal definition of a continuous function is that it can be drawn without lifting the pencil off of the paper. This function is nowhere continuous, so if you had trouble drawing it, that is because even a computer cannot do so. This function (the Dirichlet function) is extremely unruly, and many differential equations involving this function would not be solvable, i.e. a solution to the equation would not exist. Existence of solutions is a vital tenet of differential equations, as is uniqueness of solutions. Our research involves the fractional generalization of a theorem due to Lasota and Opial whereby assumption of uniqueness of solutions (in addition to other assumptions such as continuity) to a two-point boundary-value problem actually implies the existence of said solutions.

Virginia A. Saurine

3:20 p.m., Room 207

Majors: Adolescence to Young Adult Education / Religion Education

Berry Summer Thesis Institute 2015 Presenter

Susan M. Ferguson, M.S., Thesis Advisor
Center for Catholic Education

Educating the Whole Child

Many children often experience a combination of stressors in their everyday lives that can negatively impact their performance in schools. However, numerous research studies have shown that the most significant protective factor for under-resourced children is a caring, adult relationship. This study focuses on what needs to happen in the teacher-student relationship in order for the teacher to be that protective relationship. Building the teacher-student relationship aids students in developing the academic, social and emotional skills necessary to be successful in the classroom. Development and presence of academic perseverance and an academic mindset of students are the two central skills analyzed and integrated into this study to support teachers in better educating the whole child.

3:40 p.m.

Elizabeth A. Brumleve
3:40 p.m., Room 222

Major: Political Science

Nancy Miller, Ph.D., Thesis Advisor
Political Science Department

The Evolution of the Scope and Political Ambition of the State Attorneys General

This research assesses the expanding scope of the office of state attorneys general and the political ambition of the office holders. It provides both qualitative and quantitative analyses of state attorneys general and their participation in litigation, campaign finance and appointments to or campaigns for higher office.

Amelia F. Erlandson
3:40 p.m., Room 312

Major: English

Laura Vorachek, Ph.D., Thesis Advisor
English Department

The Postcolonial Effect on Women

This is a literary analysis of the books *The Kite Runner* and *What Is The What*. It looks at these books through the postcolonial lens, and particularly analyzes how women are represented in these novels and societies.

Jessica L. Grilliot
3:40 p.m., Room 310

Major: Biology

Berry Summer Thesis Institute 2015 Presenter

Thomas M. Williams, Ph.D., Thesis Advisor
Biology Department

Disentangling the CIS and Trans Causes for Diversity: A Transgenesis Approach to Infer the Genomic Sites Responsible for Differences in Gene Expression

Every trait for every organism requires the expression (making functional RNAs or proteins) for a gene or genes. Every gene experiences some form of expression regulation, often which occurs during transcription initiation. This involves cis-regulatory element (CRE) sequences located near genes being bound by transcription factor proteins coming from genes located at more distant genome locations. When a gene's expression differs between two organisms, the genetic differences might be located in two places: a CRE controlling the gene's expression ("cis-evolution") and/or in a sequence for another gene or genes ("trans-evolution"). A poorly understood question is how do mutations in CREs cause functional cis-evolution? The answer will offer new insights on the genetic basis for normal versus disease states and for the adaptations of organisms to new environments. This project focuses on identifying concrete sites of cis-evolution in order to provide excellent models to study how genetic differences alter transcription initiation.

Kara M. Jankowski
3:40 p.m., Room 207

Major: Early Childhood Education

Colleen E. Gallagher, Ph.D., Thesis Advisor
Teacher Education Department

The Implementation of Two-way Immersion Programs

Two-way immersion programs teach students subject matter in two languages, allowing them to master two languages while continuing to work at grade level. Studies have proven these programs to be effective for raising student achievement for both language-majority and language-minority students (Fortune, 2014, Thomas and Collier, 2003). As these programs become more attractive to school districts, more information is needed to determine the human and material resources necessary for successful implementation. This case study examines factors such as teachers, finances and community attitudes to determine the practicality of two-way immersion programs being implemented on a wider scale.

Elizabeth A. Kelsch
3:40 p.m., Room 311

Major: Exercise Physiology

Berry Summer Thesis Institute 2015 Presenter

Anne R. Crecelius, Ph.D., Thesis Advisor
Department of Health and Sport Science

The Impact of Acute Hypoxic Exposure on Microvasculature Function in Young, Healthy Humans

Cardiovascular health is a major topic of discussion in the world of medicine today. One of the main components of the cardiovascular system is our blood vessels. Understanding the health of our blood vessels is essential because vascular function is an important marker of overall risk for cardiovascular morbidity and mortality. One area of interest that we are looking into is the effect of hypoxia, or low oxygen exposure, on microvascular health. Since different diseases such as sleep apnea and chronic obstructive pulmonary disease can cause people to experience hypoxia, this is a relevant topic. To test microvascular health, we measure the reactive hyperemia, the return of blood flow to a specific tissue area after a brief period of occlusion. We anticipate that we will observe a difference in blood flow response between normal conditions and hypoxic conditions, and make a connection between hypoxia and vascular health.

Grace B. Poppe
3:40 p.m., Room 211

Major: English

Glenna Jennings, MFA, Thesis Advisor
Department of Art and Design

Muses and Musings: the Past and Present of Gender Identity

This book combines gender theory, portrait photography, creative nonfiction and interviews to explore the complexities of adopting gender traditions regarding family roles, makeup, shoes, hair and fashion; and investigates how this "education" ultimately continues to influence females' gender performance on a daily basis.

Alyssa R. Roeckner

Major: Psychology

3:40 p.m., Room 331

Tracy R. Butler, Ph.D., Thesis Advisor
Psychology Department

The Effect of Early Life Social Stress on Anxiety-like Behaviors and Ethanol Drinking in Female Long-Evans Rats

Studies have shown that women have a more prevalent association between early life stress, anxiety, and alcohol abuse than men. Early life stress is associated with stress hormone dysfunction in humans, and this dysfunction is recognized in alcohol dependent individuals. This relationship is seen in rat models used to study early life stress, anxiety-like behavior, and alcohol dependence. However, although human women appear to have a more consistent connection between these variables, fewer studies have been done with female rats than male rats. A reliable female animal model is needed in order to study these connections. One model used to provoke early life stress in females utilizes chronic social instability, in which rats are placed in different pairs every day. This model has previously produced anxiety-like behavior in female rats. Using this model, this experiment explored the relationship between anxiety, stress, and alcohol-dependence in female Long-Evans rats.

4:00 p.m.

Krista E. Bondi

Majors: Art History / American Studies

4:00 p.m., Room 211

Roger J. Crum, Ph.D., Thesis Advisor
Department of Art and Design

Looking Anew at the Rothko Chapel: The Future of Interfaith Space on the Catholic Campus

In today's globalized society, Catholic universities like the University of Dayton must consider the well-being of their diverse student communities. Recently, the University of Dayton — like other Catholic universities — has seen a growth in international students and, consequently, students of different faiths. These universities are at a stage of preliminary action in their attempts to accommodate their religiously diverse students through the provision of varied sacred spaces on their campuses. This research argues that the Rothko Chapel serves as an example of multi-faith religious space for the next stage of interfaith dialogue and accommodation on Catholic university campuses. With the Rothko Chapel as a model, Catholic universities in America can potentially lead the way toward innovative religious space and provide a necessary, even progressive, artistic context for interfaith dialogue on their campuses.

Luke F. Bugada

Major: Chemical Engineering

4:00 p.m., Room 311

Matthew E. Lopper, Ph.D., Thesis Advisor
Chemistry Department

The Use of a Molecular Probe to Investigate the Details of PriA Helicase Function

DNA replication in bacteria is an essential process through which a cell's genetic information is copied. The replication machinery often encounters DNA damage that can disrupt a cell's ability to completely copy its DNA. For DNA replication to resume following these disruptive events, the replication machinery must be reloaded onto the DNA through a process initiated by the PriA helicase. We seek to better understand how PriA works by using a compound that inhibits the function of PriA. We have determined the specific mode through which the compound inhibits PriA and are working to solve the three dimensional structure of the PriA-inhibitor complex. Finally, we are attempting to pinpoint where the inhibitor binds on the surface of PriA. Our findings will contribute to understanding the mechanism through which PriA rescues the replication machinery following disruptive encounters with DNA damage.

Kristin R. Creel

4:00 p.m., Room 331

Majors: PreMedicine / Psychology

Tracy R. Butler, Ph.D., Thesis Advisor
Psychology Department

Effects of Acute Stress and Ethanol Consumption on IL-1β in Female Long Evans Rats: A Pilot Study

Many physiological, behavioral, and neuropathological effects result from acute stress; one of which is alteration of immune system function. When stress occurs in humans and animal models, immune function responds by increasing the production of interleukin-1β (IL-1β). IL-1β is an inflammatory cytokine known for its response to damage, disease, and stress.

Additionally, alcohol consumption may also impact immune function by suppressing IL-1β production. Thus, although some acute stressors may lead to increased alcohol consumption, these two forces will overall work against each other by promoting and inhibiting the production of IL-1β.

Previous studies have shown that alcohol consumption independently is able to decrease IL-1β activation, but it remains unknown which acute stressors increase alcohol consumption in female Long Evans rats and what overall effects this will have on IL-1β. This pilot study will assess three acute stressors and evaluate their ability to increase alcohol consumption and alter IL-1β production.

Caroline A. Goodill

4:00 p.m., Room 207

Major: Middle Childhood Education

Kathryn A. Kinnucan-Welsch, Ed.D., Thesis Advisor
Teacher Education Department

Berry Summer Thesis Institute 2015 Presenter

An Analysis of the Educational Systems in Finland and the United States: A Case Study

The millennial trend of globalization has engulfed the field of education, creating an international dialogue of educational ideologies, practices, and policies. International tests have ranked education systems, leading the world's attention to those who achieve the highest on the tests: Finland. Finland and the United States offer similar practices and programs in terms of special education and teacher education, two dimensions of the educational system that could influence standardized test results. However, these two countries achieve quite differently on international tests. The disparity of test results may lie within the differences of scope and implementation processes for these programs. Research from the Finnish models regarding these programs create guiding vessels that, when 'Americanized' to fit the context of the diverse American background, could foster an equitable education system in the United States.

Margaret A. Maloney

4:00 p.m., Room 222

Majors: Human Rights Studies / Spanish

Joel R. Pruce, Ph.D., Thesis Advisor
Political Science Department

Human Rights and Healthy Societies: Opening Social and Cultural Spaces for Peacebuilding

Exploring peace demands rethinking many of the assumptions that have driven the field of peacebuilding. Previously, scholars have investigated the content of peace agreements for guidance in sectors that include security, justice, and democracy. However, I hypothesize that by focusing narrowly on these areas, scholars and peacemakers overlook crucial ingredients that create stable post-conflict societies. This thesis examines the inclusion of social and cultural rights in peace agreements and aims to contribute to a more robust understanding of whether traditionally "soft" issues like education, art, and women's participation may have significant impacts on the long-term health of society — and therefore positively influence the root causes of conflict. I study the transitional processes in Northern Ireland to determine how the inclusion of social and cultural rights protections relate to the prospects for sustainable peace.

Maxwell J. Roeske

4:00 p.m., Room 310

Major: Biology

Thomas M. Williams, Ph.D., Thesis Advisor
Biology Department

Tracing the Role of bab Gene Duplication and Divergence Events in the Evolution of a Fruit Fly Pigmentation Trait

Mutation events can duplicate a gene resulting in a pair of paralogous genes. Such increases in gene number are thought to open additional paths for the subsequent functional evolution of genes. These paths include changes in protein coding sequences, changes in the sequences regulating gene expression, or a blended path of both coding- and regulatory-sequence evolution. *Drosophila melanogaster* possesses paralogous bab1 and bab2 genes that resulted from an ancestral duplication event. These paralogous genes gained a role in regulating sex specific coloration. My thesis uses these paralogs as a model to investigate the relative contribution of protein-coding and regulatory sequence evolution in the origin of the coloration phenotype. This involves testing whether the coding sequences for these paralogous genes are functionally equivalent through loss-of-function and gain-of-function methods. Ultimately, this work will demonstrate what changes to an animal gene made the origin of a novel trait possible.

Joseph A. Spieles

4:00 p.m., Room 312

Major: English

John P. McCombe, Ph.D., Thesis Advisor
English Department

Culture and Popularity: A Critical Analysis of Contemporary Dystopian Texts

The past two decades have seen a surge of dystopian novels aimed at teenaged and young adult audiences. Many of the novels have been so well received that they were rapidly adapted into films. I am investigating the cultural obsession with dystopian stories and their popularity in young adult audiences through a critical analysis of *The Hunger Games* trilogy, novels and films, with references to additional contemporary dystopian novels and films. I also aim to explicate the differences between dystopia as a literary genre and other forms of society demonstrated in literature that show civil unrest. I am analyzing the novels, films and social movements behind these contemporary texts to account for their popularity in young adult culture.

4:20 p.m.

Amanda J. Dee

4:20 p.m., Room 312

Majors: English / Journalism

John P. McCombe, Ph.D., Thesis Advisor
English Department

Ghetto University

I am investigating the contexts that shape a name or symbol and how that name establishes, counters, and/or reinforces power within a community. This name is "The Ghetto," the name ubiquitously used by outside media outlets and University of Dayton students, alumni, and some of its faculty and administrative staff to describe the university-owned student neighborhood, until questions of the name's use began to gain traction on public platforms and in conversation. Partially as a result of a community collaborative art exhibition, GHETTO, and columns addressing the name in the student newspaper, Flyer News, hate — especially racial hate — has ignited on social media sites like Yik Yak, Instagram, and Facebook. But attempted dialogue has also emerged. Based on voices of university and city community members from public platforms and original interviews in tandem with comparative cases at other universities and in pop culture, I will offer an analysis of this moment of discourse from a critical perspective.

Claire C. Konys

4:20 p.m., Room 310

Major: Biology

Thomas M. Williams, Ph.D., Thesis Advisor
Biology Department

The Role of Polycomb and Trithorax Genes in the Development and Evolution of an Animal Trait

Differences in gene expression are a prominent cause for variation in form and behavior among organisms. In eukaryotes, gene expression is regulated through the compaction of DNA sequence into chromatin. Gene expression is by default "OFF" due to a repressive compact chromatin state. Expression can be switched "ON" through the modification of histone proteins and by histone repositioning. In the fruit fly species *Drosophila melanogaster*, the Polycomb Group of genes can induce the formation of repressive chromatin and the Trithorax Group of genes can induce permissive chromatin. How these Polycomb and Trithorax genes collectively regulate the development of a trait and their contribution to the evolution of a trait remains poorly understood. My thesis focuses on answering which genes shape a *Drosophila melanogaster* pigmentation trait, when they are needed during this trait's formation, and whether the uses of these genes have evolved to shape evolutionary changes in pigmentation.

Kelli R. Marquardt

4:20 p.m., Room 222

Majors: Applied Mathematical Economics

John Ruggiero, Ph.D., Thesis Advisor
Economics and Finance Department

Comparison of Nonparametric and Parametric Estimations of Hospital Production Frontiers Used for Hospital Efficiency Analysis

This project explores two different estimation techniques for hospital production frontiers. Data is generated to compare data envelopment analysis, a nonparametric estimation technique, and a parametric regression model. Comparisons of the two approaches are made using simulation analysis. Each technique is then applied to real hospital data provided by the Hospital Cost Utilization Project (HCUP) to measure efficiency, defined as the ratio of observed to frontier production. Factors related to hospital efficiency are tested and discussed.

Kiersten S. Remster

4:20 p.m., Room 211

Major: Art History

Berry Summer Thesis Institute 2015 Presenter

Roger J. Crum, Ph.D., Thesis Advisor
Department of Art and Design

The Role of the Provocative Gesture in the History of Modern Art

Art history is traditionally practiced as the study of finished objects. While such an approach grounds inquiry in the work of art itself, it does not take into consideration the broader context of art history as a discipline that charts the history of objects from conception to creation to reception. To address this situation, this research aims to illuminate the complex dynamics in thought, written expression, and even acts that exist before the actual production of art. Specifically, it advances the idea that in the history of modern art from the mid nineteenth century to the present, the act of provocation has been of sufficient centrality as a catalyst to the artistic object that it merits consideration in terms of its own history, purposes, and forms.

Melissa R. Siegel

4:20 p.m., Room 207

Majors: Adolescence to Young Adult Education / Mathematics

Mary-Kate Sableski, Ph.D., Thesis Advisor
Teacher Education Department

Syntheses of Research on Dyscalculia and the Common Core State Standards

This thesis analyzed the implications for instruction under the newly adopted Common Core State Standards (CCSS) and the effects they have on students with dyscalculia. The CCSS is an educational initiative created for students to succeed in their academic endeavors through college and their professional careers. Correlations were found in the research between the instructional implications under the CCSS and intervention strategies for students with dyscalculia. Parents, teachers and students were interviewed as evidence to verify this correlation.

Adam C. Volk

4:20 p.m., Room 331

Major: Mathematics

Atif Abueida, Ph.D., Thesis Advisor
Mathematics Department

Star Decompositions of the Complete Split Graph

A graph is a discrete mathematical structure that consists of a set of vertices and a set of edges between pairs of vertices. A problem of interest in graph theory is that of graph decomposition, partitioning the set of edges into disjoint sets, producing subgraphs which are isomorphic to each other. Here we consider the problem of decomposing a class of graphs called complete split graphs into stars of a fixed size. We present conditions for the decomposition as well as an algorithm for the decomposition when it is possible.

4:40 p.m.

Rachel M. Cain

4:40 p.m., Room 312

Major: English

Tereza Szeghi, Ph.D., Thesis Advisor
English Department

Activism, Community and Cultural Heritage: "Communitism" in Creek Literature

"Communitism" refers to literature that encourages activism by celebrating and promoting American Indian communities. This thesis investigates how the literary works, *The Fus Fixico Letters* (1902 – 1908) and *Drowning in Fire* (2004), are communitist by supporting specific political and social changes in Creek communities. Through *The Fus Fixico Letters* Alexander Posey promoted his progressive political convictions, including that Creeks should embrace land allotment and endorse the creation a separate state for American Indians. *Drowning in Fire*, by Craig Womack, takes place throughout 1904 – 1993 and relates traditional Creek stories and practices to modern life. The novel delves into issues such as homophobia, racism, and the negative repercussions of land allotment. These literary works' use of communitism elucidates how the writers responded to their particular political and social challenges by addressing different specific communities within their tribe, while still supporting the survival and continuance of their Creek culture in general.

George E. Padavick

4:40 p.m., Room 211

Major: Mechanical Engineering

Berry Summer Thesis Institute 2015 Presenter

Binod Kumar, Ph.D., Thesis Advisor
Mechanical and Aerospace Engineering Department, UDRI

An Investigation into Supercapacitor Design with Specific Focus on Energy Density

Supercapacitors have the unique ability to charge and discharge much faster than conventional batteries making them ideal for quick energy storage. However, supercapacitors suffer from low energy density, meaning they store less energy than their battery counterparts. For example, a supercapacitor the size of a typical phone battery could charge in a few seconds but may only offer less than an hour of charge. Recent discoveries in advanced carbon materials have improved the energy density of supercapacitors, suggesting that further improvements can be made. This work analyzes current supercapacitor design and investigates various materials for supercapacitor components.

Riley C. Weber

4:40 p.m., Room 207

Major: Intervention Specialist Education

Stephen B. Richards, Ed.D., Thesis Advisor
Teacher Education Department

Identification of English Language Learners as Gifted Students

For this Honors Thesis, there are two research questions explored in depth. Overall, what assessment strategies, procedures, and instruments are more effective in identifying ELL for gifted programs? Once identified for these programs, what instructional and assessment strategies appear to be more effective? This is a current topic because most studies have focused on the overrepresentation of ELL as having learning disabilities. However, several researchers have considered the underrepresentation of ELL in gifted and talented programs and how these same students can be successful in gifted and talented programs. The presentation will include research and data related to historical perspectives, the magnitude of the need for improved assessment and identification, current strategies and their effectiveness, misunderstandings about ELL and gifted and talented programs, and directions for future research and its importance.

advisors

Advisor	Department
Abueida, Atif, Ph.D.	Mathematics
Ambrosius, Joshua D., Ph.D.	Political Science
Barrios, Joaquin A., DPT, Ph.D.	Physical Therapy
Bigelow, Kimberly E., Ph.D.	Mechanical and Aerospace Engineering
Butler, Tracy R., Ph.D.	Psychology
Carrillo, Albino, MFA	English
Collier, Trevor C., Ph.D.	Economics and Finance
Crecelius, Anne R., Ph.D.	Health and Sport Science
Crum, Roger J., Ph.D.	Art and Design
Crutcher, Robert, Ph.D.	Psychology
Cuy-Castellanos, Diana, Ph.D.	Health and Sport Science
Dixon, Lee J., Ph.D.	Psychology
Donahoe-FIllmore, Betsy K., Ph.D.	Physical Therapy
Eloe, Paul W., Ph.D.	Mathematics
Ferguson, Susan M., MS	Center for Catholic Education
Gallagher, Colleen E., Ph.D.	Teacher Education
Goldman, Daniel, Ph.D.	Geology
Hansen, Douglas C., Ph.D.	Materials Degradation and Electrochemical Engineering, UDRI
Hansen, Karolyn M., Ph.D.	Biology
Haritashya, Umesh, Ph.D.	Geology
Henning, Meghan, Ph.D.	Religious Studies
Jackson, Kurt, Ph.D., PT, GCS	Physical Therapy
James, V. Denise, Ph.D.	Philosophy
Jennings, Glenna, MFA	Art and Design
Jipson, Arthur J., Ph.D.	Criminal Justice Studies
Kango-Singh, Madhuri, Ph.D.	Biology
Kavanaugh, Jeffrey, Ph.D.	Biology
Kinney, Allison, Ph.D.	Mechanical and Aerospace Engineering
Kinnucan-Welsch, Kathryn A., Ed.D.	Teacher Education
Kumar, Binod, Ph.D.	Mechanical and Aerospace Engineering, UDRI
Lopper, Matthew, E., Ph.D.	Chemistry
Lyons, Patrick, Ph.D.	CIEE Research Station, Bonaire
Masthay, Mark B., Ph.D.	Chemistry
McCombe, John P., Ph.D.	English
McEwan, Ryan, Ph.D.	Biology
Miller, Nancy, Ph.D.	Political Science
Morgan, Thomas L., Ph.D.	English
Murray, Andew P., Ph.D.	Mechanical and Aerospace Engineering
Myzska, David, Ph.D.	Mechanical and Aerospace Engineering
Nielsen, Mark, Ph.D.	Biology
O'Mara, Erin, Ph.D.	Psychology
Pitychoutis, Pothitos M., Ph.D.	Biology
Poitras, Marc A., Ph.D.	Economics and Finance
Pruce, Joel R., Ph.D.	Political Science
Richards, Stephen B., Ed.D.	Teacher Education
Ruggiero, John, Ph.D.	Economics and Finance
Sableski, Mary-Kate, Ph.D.	Teacher Education
Sritharan, R., Ph.D.	Computer Science
Subramanyam, Guru, Ph.D.	Electrical and Computer Engineering
Szeghi, Tereza, Ph.D.	English
Taylor, Denise G., Ph.D, P.E.	Civil and Environmental Engineering
Trollinger, Susan, Ph.D.	English
Vorachek, Laura, Ph.D.	English
Watkins, David, Ph.D.	Poligical Science
Williams, P. Kelly, Ph.D.	Biology
Williams, Thomas M., Ph.D.	Biology
Yengulalp, Lynne, Ph.D.	Mathematics

presenters

Presenter	Room and Session time
Antolini, Sydney M.	Room 222, 3:00 p.m.
Ashbrock, Jonathan D.	Room 311, 1:00 p.m.
Bates, Brian D.	Room 311, 2:00 p.m.
Bell, David C.	Room 207, 3:00 p.m.
Bender, Michael J.	Room 222, 3:20 p.m.
Bjelopetrovich, Anastasia	Room 211, 2:40 p.m.
Bondi, Krista E.	Room 211, 4:00 p.m.
Brumleve, Elizabeth A.	Room 222, 3:40 p.m.
Bugada, Luke F.	Room 311, 4:00 p.m.
Cain, Rachel M.	Room 312, 4:40 p.m.
Cozad, Alison R.	Room 222, 1:40 p.m.
Creel, Kristin R.	Room 331, 4:00 p.m.
Dee, Amanda J.	Room 312, 4:20 p.m.
DeVilbiss, Matthew D.	Room 211, 3:00 p.m.
Doyle, Patrick C.	Room 331, 2:20 p.m.
Dugan, Patrick J.	Room 311, 2:40 p.m.
Duritsch, William G.	Room 310, 3:00 p.m.
Erlandson, Amelia F.	Room 312, 3:40 p.m.
Ferber, Joseph B.	Room 312, 1:00 p.m.
Ferrante, Amanda C.	Room 331, 3:00 p.m.
Giaquinto, Angela N.	Room 310, 2:20 p.m.
Goodill, Caroline A.	Room 207, 4:00 p.m.
Grilliot, Jessica L.	Room 310, 3:40 p.m.
Hallagan, Alexandra M.	Room 310, 3:20 p.m.
Hudock, Michael J.	Room 211, 2:00 p.m.
Hussain, Anam	Room 310, 2:00 p.m.
Iannantuono, George M.	Room 310, 1:00 p.m.
Jankowski, Kara M.	Room 207, 3:40 p.m.
Kaur, Gurjot	Room 311, 3:20 p.m.
Kelsch, Elizabeth A.	Room 311, 3:40 p.m.
Kleppel, Donald J.	Room 310, 1:20 p.m.
Kocoloski, Genevieve M.	Room 211, 2:20 p.m.
Konys, Claire C.	Room 310, 4:20 p.m.
Kuska, Elijah C.	Room 207, 1:40 p.m.
Lamantia, Kara A.	Room 311, 2:20 p.m.
Linzmeier, Alicia A.	Room 222, 1:20 p.m.
Loney, Stephanie M.	Room 312, 3:20 p.m.
Maloney, Margaret A.	Room 222, 4:00 p.m.
Marquardt, Kelli R.	Room 222, 4:20 p.m.
Masthay, Tyler M.	Room 211, 3:20 p.m.
Mullins, Samuel A.	Room 312, 1:20 p.m.
Ogonek, Peter J.	Room 207, 2:40 p.m.
Padavick, George E.	Room 211, 4:40 p.m.
Pair, Morgan E.	Room 331, 1:00 p.m.
Poppe, Grace B.	Room 211, 3:40 p.m.
Remster, Kiersten S.	Room 211, 4:20 p.m.
Roeckner, Alyssa R.	Room 331, 3:40 p.m.
Roeske, Maxwell J.	Room 310, 4:00 p.m.
Sanfilippo, Dominic R.	Room 312, 2:40 p.m.
Saurine, Virginia A.	Room 207, 3:20 p.m.
Schemmel, Taylor M.	Room 207, 2:00 p.m.
Sens, Jonathon P.	Room 310, 2:40 p.m.
Siegel, Melissa R.	Room 207, 4:20 p.m.
Spatz, Devin W.	Room 207, 2:20 p.m.
Spech, Sarah E.	Room 312, 2:20 p.m.
Spieles, Joseph A.	Room 312, 4:00 p.m.
Stalder, Sarah A.	Room 310, 1:40 p.m.
Tovey, Joshua D.	Room 222, 2:40 p.m.
Trujillo, Alejandro	Room 331, 2:40 p.m.
Volk, Adam C.	Room 331, 4:20 p.m.
Watson, Jordan T.	Room 311, 3:00 p.m.
Weber, Riley C.	Room 207, 4:40 p.m.
Wilson, Mackenzie L.	Room 211, 1:20 p.m.
Wynk, Jamie L.	Room 211, 1:40 p.m.

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