

INDEPENDENT SCHOLARSHIP  
& CREATIVE ACTIVITIES PRESENTATIONS



MAY 7, 2014

# ISCAP Day

Wednesday, May 7, 2014

Sweigart Hall

11:00 AM – 3:00 PM

## Schedule:

<b>11:00-12:30</b>	<b>Panel Session</b>	<b>Sweigart 117, 118</b>
<b>12:30-1:30</b>	<b>Poster Session &amp; Lunch</b>	<b>Sweigart Atrium</b>
<b>1:30-3:00</b>	<b>Undergraduate Research Scholar Awards Session</b>	<b>Sweigart 115</b>

## Planned by the URSA Committee:

Justin Burton  
Jason Chiu  
Karen Gischlar  
Catrinel Haught  
Brooke Hunter  
Kenneth Kauffman  
William Kline  
Sean McCarther  
Gabriela Smalley  
Bryan Spiegelberg



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May 7, 2014

Dear Students, Scholars, Faculty and Families,

Today the Rider University community will hear about the remarkable scholarship, research, and creative endeavors of our students as they apply their college education in innovative ways. To those students who are presenting their work today, I extend congratulations on your achievements. To all those who supported these students in their academic adventures, I offer appreciation and thanks. These activities exemplify the many valuable opportunities and resources students enjoy at Rider to enrich their learning experience. Frankly, our students could not have done their work without you.

Special congratulations to this year's Undergraduate Research and Scholarship Award winners. These students proposed detailed independent projects to be carried out in the following academic year and will each receive a \$5,000 tuition scholarship. You will hear about the wide variety of projects they will be undertaking in the awards session later this afternoon.

Whether you conducted research or helped to make it happen, your efforts send a strong message about the academic excellence students can achieve at Rider. Congratulations to everyone involved!

Sincerely,

Mordechai Rozanski



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May 7, 2014

Dear Students, Faculty, and Family Members,

Today is a full day dedicated to honoring and showcasing the creative works and research of Rider University students in collaboration with their faculty mentors. Each year, the Undergraduate Research Scholar Awards (URSA) Committee hosts ISCAP (Independent Scholarship & Creative Activities Presentation) Day in an effort to display student originality and contributions to their fields of interest. ISCAP Day is also meant as a forum for members of the Rider community—both faculty and students—to come together in an interdisciplinary dialogue focused on students' creative projects.

Another very important purpose for ISCAP Day is to announce the new URSA scholarship recipients, as well as to hear about the progress made among last year's URSA award winners on their year-long projects. This portion of the day is particularly important as we honor some of the most gifted undergraduates at Rider. We congratulate you on your monumental accomplishment.

Please join us as we celebrate these student achievements and honor their creative works. Congratulations on a job well done!

Sincerely,

DonnaJean A. Fredeen  
Provost and Vice President for Academic Affairs

**Panel Session**  
11:00 AM – 12:30 PM

**Panel 1: Understanding Culture**

**Location:** Sweigart 118

**Chair:** Dr. Jason Chiu (URSA Committee, Department of Finance and Economics)

**Anglo-Saxon Race Theory: 1850-1915**

Erich M. Huhn (History, Dr. Thomas Callahan)

**Schoenberg's Brettli-Lieder and The Struggle for New Truth at the End of Romanticism**

Amanda Vest (Voice Pedagogy & Performance, Dr. J. J. Penna)

**An American Dream Come True: Nostalgia and Futurism in the Culture of Walt Disney**

Kyle Stenger (History, Dr. Erica Ryan)

**What About Us?: A Study of the Underrepresentation of Women in Managerial Positions**

Sarah D. Lopez (Marketing, Dr. John Donovan)

**Panel 2: Man and Nature at War**

**Location:** Sweigart 117

**Chair:** Dr. Brooke Hunter (URSA Committee, Department of History)

**Effects of Watering Regimes on *Latuca sativa*: Is there an adaptive change that makes a "stronger" plant?**

Daniel Pace (Biochemistry, Dr. Laura Hyatt)

**Follow the Leader: An Examination of Veteran Music Teachers' Evolving Classroom Management Practices**

Joy Suslov (Music Education, Dr. Janet Cape)

**Austria's Demise and the Origins of the Great War: 1908-1914**

John Burdi (History, Dr. Lucien Frary)

**America's Armor**

Jonathan Murphy (History, Dr. Joseph Gowaskie)

**Riparian Land Use and Power in World War II-Era New Jersey**

Michael Musso (History, Dr. Brooke Hunter)

## Poster Session

Sweigart Atrium, 12:30 PM – 1:30 PM

1. **Rachel Awe** (Marine Science, Dr. Schwimmer): Garnet provenance study of beach sands from Sandy Hook and Cape May, New Jersey
2. **Eric Balboa** (Psychology, Dr. Golski): The Influence of Stereotype Threat on Speed and Accuracy
3. **James Birkenstamm** and **Tom Weindl** (Biochemistry, Dr. Burnham): A green approach to the synthesis of pyrrole C5-nucleosides as potential antiviral agents
4. **Jason Dallas** (Environmental Sciences, Dr. Druckenbrod): Freshwater Turtle Population in an Urban Lake and the Benefits of Installing Basking Logs
5. **Rebecca Hoppe** (Psychology, Dr. DiYanni): Nonsense word recognition in monolinguals and bilinguals
6. **Drew Kelly** (Marine Science, Dr. Benitez-Nelson): Measuring Particulate Phosphorus: A Comparison of Two Methods
7. **Kelly Krolik** (Marine Science, Dr. Smalley): The Response of Tropical Fish Species to Boat Noise Disturbances
8. **Taylor Krolik** (Marine Science, Dr. Smalley): Effect of Marsh Type on Biological and Physical Factors in the Marsh Environment
9. **Dana Laag** (Psychology, Dr. Golski): Openness and Cognitive Styles in the Aesthetic Experience: Abstraction vs. Realism
10. **Michael Lagala** (Psychology, Dr. DiYanni): The Effects of Competition in Non-Violent vs. Violent Video Games
11. **Sarah Mozes** (Geoscience, Dr. Schwimmer): Paleoenvironmental Investigation of the Cambro-Ordovician Allentown Dolomite, Hamburg, NJ
12. **Steven Murkli Jr.** (Chemistry & Biology, Drs. Jacobs & Bidle): Efficacy of Novel *N*-(2-(Pyridin-2-yl)Ethyl)Sulfonamides as Antimicrobial Agents
13. **Alexa Nyktas** and **Breanna Ciberey** (Psychology, Dr. DiYanni): Rational imitation and conformity in Asian American vs. Caucasian American Preschoolers
14. **Jennifer Smolyn** and **Elizabeth Urban** (Biology, Dr. Drawbridge): A role for *gdnf* in pronephric duct cell migration in *Xenopus laevis*
15. **Chelsea Stebbins** (History, Dr. Shepardson): Paving the Steps to the Celestial Kingdom: The Purposeful Vagueness of the Mormon Prophet on Race
16. **Tyrus E. Takacs** (Biology, Dr. Webber): The Effects of Circadian Disruption on the Onset of Obesity and Diabetes in Mice
17. **Amanda Vest** (Voice Science, Dr. Price): The Effect of Nasal Occlusion on Breathing in Singing
18. **Jaclyn Webber** (Environmental Sciences, Dr. Hyatt): Demography, Time of Year, and Rainfall Effects on Soil Levels of Isothiocyanate in Garlic Mustard Populations

# Undergraduate Research Scholar Awards Session

Sweigart Auditorium (SWE 115)

1:30 PM – 3:00 PM

<p>1:30-2:45</p>	<p style="text-align: right;"><b>Presentations by 2013-14 URSA Recipients</b></p> <p><b>Louis A. Esposito</b>, Fine Arts/Art Concentration <i>Body of Work: Work on the Body</i> (Dr. Deborah Rosenthal)</p> <p><b>Oleksandra Dorosheva</b>, Biochemistry <i>Determination of a Role for Gβγ in the Cell Cycle Progression in Human Cells</i> (Dr. Bryan Spiegelberg)</p> <p><b>Sara Hartigan</b>, Psychology and Law &amp; Justice minor <i>Sentiment in the Courtroom: Effects of Displayed Attorney Emotion During Closing Arguments on Juror Decision-Making</i> (Dr. Wendy P. Heath)</p> <p><b>Amanda Bertram</b>, Psychology <i>Measurement of participant agreement with steps one through three of a twelve-step recovery program</i> (Dr. Gary M. Brosvic)</p> <p><b>Farzana Razack</b>, Business Economics and Health Administration minor <i>The Geographic Distribution of Physicians in the United States</i> (Dr. William Amadio)</p>
<p>2:45-3:00</p>	<p style="text-align: right;"><b>Announcement of 2014-15 URSA Recipients</b></p> <p><b>Kelsey Carroll</b>, Theatre Performance &amp; Business Administration <i>Shift: A Socially Aware and Devised Theatrical Exploration of the Universal Journey of Change through the Art of Listening</i> (Dr. Trent Blanton)</p> <p><b>Brandon Enalls</b>, Biochemistry <i>Examination of caspase-like activity in diverse members of the Archaea</i> (Dr. Kelly Bidle)</p> <p><b>Derek Lake</b>, Finance &amp; Accounting <i>The Impact of Automation on the U.S. Labor Market</i> (Dr. Kelly Noonan)</p> <p><b>Nicolette Mateescu</b>, Psychology and Sociology minor <i>Effect of Stimulus Valence and Familiarity on Wisconsin Card Sort Performance: Validity Assessment for Individuals with Intellectual Disabilities</i> (Dr. Michael Carlin)</p> <p><b>Jessica Stanislawczyk</b>, Voice Performance <i>Understanding Westminster's Role in the U.S. Cold War Foreign Policy: The State Department Tour of 1956-57</i> (Dr. Eric Hung)</p>

# PROJECT ABSTRACTS

PSTR= Poster Session  
PNL= Panel Session  
URSA=URSA Session

## Rachel Awe

### *Garnet provenance study of beach sands from Sandy Hook and Cape May, New Jersey*

The provenance of New Jersey beach sand garnets can be used to evaluate sediment transport pathways from source area to different portions of the NJ coastline. Garnet grains were selected due to their relative abundance in NJ beach sands, resistance to weathering, and distinctive chemical compositions. This preliminary study focuses on the provenance of beach sands from Sandy Hook and Cape May. These locations were selected because they represent the northernmost and southernmost points along NJ's Atlantic barrier coastline, respectively, and therefore might provide the greatest potential for compositional differences. Likely source regions for Sandy Hook garnets include the Adirondacks and the New England province with the Hudson River and Connecticut River watersheds as two possible transport pathways combined with glacial transport and deposition. Cape May garnets potentially are derived from the NJ and PA piedmont and highlands provinces via the Delaware River. Initial results from X-ray diffraction reveal Sandy Hook garnets to be mainly of almandine composition with a lower abundance of garnets with pyrope composition. The garnets from Cape May have yet to be classified. Future comparison of NJ garnet compositions to those from potential source regions will help to distinguish garnet provenance. (Dr. Reed Schwimmer) **PSTR**

## Amanda Bertram

### *Measurement of participant agreement with steps 1-3 of a twelve-step recovery program*

This research project assessed how expectations affect participation in and personal conceptualizations of the first three steps of a twelve-step recovery program. Two hundred active participants in Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) provided data using a single primary survey instrument. The development of a scale in which measurement of participants' agreement with the first three steps of a twelve-step recovery program was the emphasis of this research project. The results of this research supported the hypothesis that participant agreement with steps one through three of a twelve-step program was a measurable element. (Dr. Gary M. Brosvic) **URSA**

## John Burdi

### *Austria's Demise and the Origins of the Great War: 1908-1914*

My senior project explores the origins of World War I and simply the significance of the paper is that Austria-Hungary was the culprit of World War I. The origins began with the annexation of Bosnia and Herzegovina in 1908 which began the distrust of Austria-Hungary by Great Britain, France, Russia, and Serbia. After the annexation, the paper explores the characteristics of the Austrian leadership notably Franz Joseph, Franz Ferdinand and others. The leadership did not represent a cohesive government and the inability to agree lead to the delay in response to Serbia following the assassination. Hence, 1908 was an extremely crucial year in Europe and with the increasing decline in the overall system of Austria-Hungary, the regime became incredibly weak. Therefore, World War I was underway by the annexation of 1908 and the Austrian leadership not being a cohesive cabinet in making a response to Serbia following the assassination. This paper is unique because it shines a light on Austria-Hungary as being responsible for World War I, while most historians ignore Austria-Hungary. Traditional interpretations of the war are long term camps and Germany being aggressive through mobilization. (Dr. Lucien Frary) **PNL**

## **Eric Balboa**

### *The Influence of Stereotype Threat on Speed and Accuracy*

The present study examined the influence of stereotype threat on measures of executive function in female undergraduates. Stereotype threat is the underperformance exhibited by individuals when they are reminded of their alleged inferiority or a group difference in a particular domain. Executive functioning mediated tasks include decision making, attention, and the inhibition of eating and aggression. Prior to testing participants read a statement that suggested either the presence or absence of sex differences in task performance. Tasks included the Trail Making Test (TMT) and Card Rotations (CR). Those under stereotype threat completed items more quickly in TMT, and at the expense of accuracy in CR. (Dr. Stephanie Golski) **PSTR**

## **James Birkenstamm and Tom Weindl**

### *A green approach to the synthesis of pyrrole C5-nucleosides as potential antiviral agents*

Nucleoside analogs have a long history of use as anticancer or antiviral drugs. Since there is only one drug featuring a 5-membered nitrogen heterocyclic nucleoside currently in use, ribavirin, and none from the pyrrole class, then these nucleoside derivatives represent new and challenging targets for synthesis. The goal is to use green chemistry techniques such as an ionic soluble support system to prepare such pyrrole nucleosides with a ribose group at the C-5 position, enhancing the yield and decreasing the amount of solvents and chemical reagents used. The key benefit of using ionic liquids as a soluble support is the easy removal of excess reagents and by-products from the reaction. The pyrrole ring is constructed from a three-carbon synthon, a chloroaldehyde, and an amino ketone under neutral conditions. This soluble support technique has shown an increase in yield of the pyrrole ring formation and isolation. This technique allowed for the quick isolation of the newly formed pyrrole by use of flash chromatography. The pyrrole-C5-nucleoside is then prepared by treating the pyrrole with a Lewis acid (TiCl<sub>4</sub>) followed by the addition of a protected ribose 1-acetate. Deprotection by sodium methoxide affords the pyrrole-C5-ribonucleoside product and the detachment of the reusable soluble support ionic liquid. (Dr. Bruce Burnham) **PSTR**

## **Kelsey Carroll**

### *Shift: A Socially Aware and Devised Theatrical Exploration of the Universal Journey of Change through the Art of Listening*

Through this project I will devise a new one-woman show that will speak to the issue of female mistreatment and address the universal topic of change. I will create this piece through collecting first-person interviews from women of all walks of life and then compiling a narrative of change, forgiveness and growth. I will also use movement and visual arts to help aid in the storytelling process. This study of transformation, creating new work, and enacting social change through the arts will culminate with a final performance, script, and article detailing my process, personal growth and change. (Dr. Trent Blanton) **URSA**

## **Jason Dallas**

### *Freshwater Turtle Population in an Urban Lake and the Benefits of Installing Basking Logs*

In recent years, the impact humans have on species has become an ever increasing aspect of ecology. Reptilians have not had the study like that of other taxa due to their enigmatic behavior and that they stay out of the way of the public. In this study we focused on the population of freshwater turtles and their basking behavior with the installation of basking logs in Centennial Lake on the campus of Rider University in Lawrenceville, New Jersey. The population of Eastern Painted Turtles (*Chrysemys picta picta*) was female biased which differs from prior research done in urban areas. The installation of basking logs showed that interspecific competition occurred and adults will relegate juveniles to a less preferable basking log closer to human activity. Our data suggests that the location

of a basking log is essential to its usefulness and that urban water bodies may not be male based as previously thought. (Dr. Daniel Druckenbrod) **PSTR**

## **Oleksandra Dorosheva**

### *Determination of a role for Gβγ in Cell Cycle Progression in Human Cells*

Control of the cell cycle by regulatory proteins is critical for organisms' development and survival. Recent studies have shown that the signaling protein Gβγ is involved in the regulation of the mitotic spindle during the cell cycle in lower organisms, but it is not clear whether Gβγ regulates cell cycle progression in human cells. To address this question, cellular localization of Gβγ and physical association with the mitotic spindle as human cells undergo mitosis were examined. Immunofluorescence microscopy on normally cycling and nocodazole-synchronized HEK293 cells showed that Gβγ co-localizes with α-tubulin during specific stages of mitosis. Specifically, Gβγ was found to re-localize from the periphery of the cell in interphase to locations consistent with the mitotic spindle and enriched in α-tubulin during metaphase. Co-immunoprecipitation experiments further suggest the biochemical association of α-tubulin and Gβγ. The resulting insight into the cell cycle may facilitate the understanding of the cell cycle dependent diseases such as cancer. (Dr. Bryan Spiegelberg) **URSA**

## **Brandon Enalls**

### *Examination of caspase-like activity in diverse members of the Archaea*

Cysteine-aspartate specific proteases, or caspases, are highly-specific enzymes that function to catalyze programmed cell death (PCD) in higher organisms. Despite the lack of genetic homologs for these enzymes in organisms from the second major prokaryotic domain, the *Archaea*, caspase-like proteolytic activity has recently been detected in the haloarchaeon *H. volcanii* as well as a number of other diverse members of the *Archaea*. The proposed research aims to further investigate the extent of caspase-like activity in *Archaea*, particularly in response to high stress. It is anticipated our results will help to better elucidate the evolutionary emergence of these distinct proteins. (Dr. Kelly Bidle) **URSA**

## **Louis A. Esposito**

### *Body of Work: Work on the Body*

As a painter fascinated by the human figure, I studied the rich canvases of the enigmatic 20<sup>th</sup>-century painter, Balthus. To understand his process, I began by drawing from many Balthus paintings I found in books and, even more importantly, from a large group of Balthus paintings gathered for an exhibition at the Metropolitan Museum of Art that took place in the fall. My drawings analyzed Balthus compositions with a figure of a young girl; I also did many analytical drawings from Balthus' own sources of inspiration, including such painters as Piero della Francesca, whose figure compositions using perspective helped me understand Balthus' figures and their arrangement on the canvas. In the second half of the year, I worked on paintings of my own from live models in the studio, which were based on ideas I found in Balthus. Rather than focusing on the erotic quality of the model, I found in Balthus the idea that the pose and the geometry and the quality of light in the painting all had great importance in building a figure painting; all these things help express the relationship of the painter to his human subject. (Dr. Deborah Rosenthal) **URSA**

## **Sara Hartigan**

### *Sentiment in the Courtroom: Effects of Displayed Attorney Emotion During Closing Arguments on Juror Decision-Making*

An experiment was conducted to investigate the effects of displayed attorney emotion during closing arguments on mock jurors' decisions. The prosecutor's level of emotion (anger, sadness, no emotion)

and the defense attorney's level of emotion (anger, sadness, no emotion) were manipulated. Participants ( $N = 174$ ) read a brief statement of facts regarding the events that led up to and followed the rape of the victim. Participants were then shown videos of closing arguments provided by the prosecutor and defense attorney and then answered a questionnaire. When the prosecutor displayed sadness as opposed to being angry or neutral, participants saw the defendant less favorably (e.g., perceived the defendant as more guilty and deserving of a longer sentence). (Dr. Wendy P. Heath) **URSA**

## **Rebecca Hoppe**

### *Nonsense word recognition in monolinguals and bilinguals*

This study involves using real and nonsense words to examine language differences in bilingual and monolingual adults and children. Participants were asked to study a list of nonsense words and definitions, and were later tested on their ability to use the novel words in sentences indicating that they recalled what the words meant. Then they were asked to choose the most appropriate definitions from a list of options for words in a second list consisting of both real words and nonsense words. Results from the adult sample indicated that males were marginally better than females at learning new nonsense words. Also, the older one was when they learned English, the better they were at defining real and nonsense words in the multiple choice test. However, there were no statistically significant differences between bilingual adults and monolingual adults in their ability to learn or to recognize nonsense words. Currently, I am still collecting data for my child sample, but I should have results by ISCAP Day. I am hoping that I may find a developmental difference, in which bilingual children may be different from monolinguals in their ability to learn nonsense words, but that this difference may disappear by adulthood. (Dr. Cara DiYanni) **PSTR**

## **Erich M. Huhn**

### *Anglo-Saxon Race Theory: 1850-1915*

Since the beginning of time people have tried to promote themselves and their groups over others. With the emergence of race studies during the scientific revolution, nations saw another way to explain their exceptionalism. Not limiting themselves to broader ideas based on continental divides, European nations went as far as dividing themselves along racial lines. The theory of an Anglo-Saxon race that gains strength at this time comes to dominate cultural and political spheres of America, Great Britain, and Germany. With hopes of establishing an Anglo-Saxon empire, even Cecil Rhodes adds to the theory when he establishes the scholarship with his namesake. But where does this theory come from? What evidence was used to support it? And finally how did the ideas of an Anglo-Saxon race influence the world between 1850 and 1915? Between imperialism, eugenics, phenology, anthropology, sociology, and countless other fields this theory emerges and comes to dominate every aspect of culture in the Anglo-Saxon world. (Dr. Thomas Callahan) **PNL**

## **Drew Kelly**

### *Measuring Particulate Phosphorus: A Comparison of Two Methods*

Phosphorous (P) is a major element in oceans and a key biological macronutrient in coastal marine ecosystems. Most oceanic P is derived from erosional riverine runoff in the particulate form, which includes particulate organic phosphorus (POP) and particulate inorganic phosphorus (PIP). An estimated  $7.4-15.6 \times 10^{11}$  mol P  $y^{-1}$  is deposited into the ocean, including anthropogenic P from human activity (i.e., deforestation and fertilizer use). Once P enters coastal waters, it either sinks to the seafloor, or is remineralized into the dissolved phase. The magnitude of this remineralization ultimately impacts the amount of dissolved P available for primary production. Therefore, measuring P within various dissolved and particulate pools is crucial for understanding how changes in P biogeochemistry influences P bioavailability and hence, marine ecology and community structure.

Recently, popular protocols that calculate oceanic total particulate P (TPP) have been questioned in regards to their ability to accurately measure all of the particulate (organic and inorganic) pools in suspended and sinking particles. The methodological improvements made by Labry et al. (2013) combines steps from two different protocols and has been shown to increase P recoveries up to 100%. The goal of this study is to compare historical and new methodologies in TPP measurement on select P compounds and natural samples in order to understand if this change in methodology produces significantly different results. (Dr. Claudia Benitez-Nelson, Univ. of South Carolina) **PSTR**

## **Kelly Krolik**

### *The Response of Tropical Fish Species to Boat Noise Disturbances*

Boat traffic poses a threat to wildlife due to the chronic noise pollution boats emit. This noise can affect organisms by causing stress and increasing mortality rates. This study investigated the response of two damselfish species to boat noise disturbances. Boat engine sounds were played to *Chrysiptera parasema* and *Chromis viridis* and their responses to two different treatments, sound only and sound while feeding, were videotaped. *C. parasema* responded to boat noises by fleeing to shelters, while *C. viridis* was unresponsive to the sound. Both species responded to the sound while feeding by pausing their activities. Boat noise affects the behavior of fish and can potentially interfere with communication and daily activities. (Dr. Gabriela Smalley) **PSTR**

## **Taylor Krolik**

### *Effect of Marsh Type on Biological and Physical Factors in the Marsh Environment*

A changing shoreline has caused an increase of the invasive species, *Phragmites australis*, in the tidal marsh which has led to a decrease in natural marsh plant habitat. The introduction of a new dominant plant species can alter biological and physical factors within the marsh. Factors such as sediment grain size, abundance and diversity of benthic organisms, soil organic matter, and above/belowground biomass of each plant species, can help show how the plants shape the environment around them. Sampling two areas (*Phragmites* and natural dominated marsh) at the Hamilton marsh were used to test these factors. Benthic invertebrates were more abundant in the *Phragmites* marsh but also had more diversity than in the natural marsh. The *Phragmites* dominated marsh had sediment with a greater sand content at the surface and greater clay content at the bottom, which was opposite in the natural marsh. Soil organics and below ground biomass were found to be greater in the natural marsh while there was no difference in above ground biomass between the two marsh types. The increase of *Phragmites* in the marsh has changed the structure of the marsh habitat, influencing many processes that occur there. (Dr. Gabriela Smalley) **PSTR**

## **Dana Laag**

### *Openness and Cognitive Styles in the Aesthetic Experience: Abstraction vs. Realism*

Aesthetics are a topic of psychological and philosophical interest addressing how visual experiences are perceived and evaluated by viewers. One of the theorized determinants in the aesthetic experience is cognitive style, more specifically a viewer's levels of field dependence and differentiation. Field dependence is the measure by which an individual relies on externally provided information, and differentiation is the ability to identify figures, shapes, and objects embedded into a larger form or ambiguous whole (Witkin, 1954). These levels have been correlated with particular personality elements, and lumped into four categories: Concrete-sequential, abstract-sequential, concrete-random, and abstract-random (Gregorc, 1982). In visual art, abstract painting and realist painting tend to have a clearly split audience that feels strongly attracted to one over the other. Where abstraction lacks external information and formal ordering of space, realism is inversely composed according to the world we are familiar with, where all visual information is provided and the space is formally ordered. The present study applied Witkin's theory of cognitive styles to the

ratings of both abstract and realist visual art using Gergorc's method of stylization and an openness measure from the NEO-P1-3 assessment. Correlations were found between openness and cognitive styles in art preference. (Dr. Stephanie Golski) **PSTR**

## **Michael Lagala**

### *The Effects of Competition in Non-Violent vs. Violent Video Games*

To determine the effects of competition in violent and non-violent video games, I conducted a study that surveyed Rider students before and after playing a video game and analyzed the results. Students were randomly assigned to four different groups; playing a non-violent, racing game alone, playing the racing game against me, playing a violent, fighting game against me, or playing the fighting game against a computer controlled opponent. Participants in the racing groups would partake in a three lap race, either against me or alone, while participants in the fighting groups would compete in a best of three round fights against me or a computer. With this arrangement, each group faced varying levels of competition and violence. Surveys distributed both before and after play asked participants to rate current levels of stress, anxiety, anger, and competitiveness. No differences were found overall between the four groups in terms of stress, anxiety, and anger as well as no effects of competition or violence. However, there were positive effects within all four groups; stress and anxiety significantly decreased in every group. (Dr. Cara DiYanni) **PSTR**

## **Derek Lake**

### *The Impact of Automation on the U.S. Labor Market*

The purpose of my research is to explore the possible effects of automation/computerization on the labor market of the United States. Robotics and software companies are rapidly developing innovative technology which threatens the jobs of millions of Americans. Self-driving transportation vehicles, software algorithms, and automated farming equipment are just a few examples of technology threatening to replace American workers. There is as much incentive as ever for companies to automate business processes to maximize profits, therefore automation is inevitable. How will the government deal with impending layoffs? What niches can displaced American workers fill to find employment? And will rapid automation of jobs in the United States ultimately drive down demand for products due to an impoverished class? Each of these questions will be addressed in my research. (Dr. Kelly Noonan) **URSA**

## **Sarah D. Lopez**

### *What About Us?: A Study of the Underrepresentation of Women in Managerial Positions*

This presentation will explore how discrimination and less obvious sociological factors lead to the underrepresentation of women in managerial positions in Fortune 500 companies. Not only will it examine how self-created and socially ingrained internal barriers hold women back, but also how discrimination contributes to the problem. Further, to test whether or not the negative perceptions of women in managerial positions have changed over time, a case study was conducted at Rider University using business honors students and these findings will also be discussed. The second part of the presentation will go into detail on whether or not there are a significant amount of female leaders outside of these large companies (i.e., in small businesses, nonprofits, etc.). Many people might believe that simply because women are not in managerial positions in Fortune 500 companies that there is an underrepresentation of women in managerial positions; however, there may be a vast number of female leaders in small businesses and the community that are not taken into account when discussing the absence of women from leadership positions. (Dr. John Donovan) **PNL**

## **Nicolette Mateescu**

### *Effect of Stimulus Valence and Familiarity on Wisconsin Card Sort Performance: Validity Assessment for Individuals with Intellectual Disabilities*

The Wisconsin Card Sorting Test (WCST) and two novel card sets will be used to assess effects of familiarity and valence on sorting in children with intellectual disabilities (ID). Accuracy and speed of sorting each card set by color, form, and numerosity will be assessed, as will the standard test administration assessing executive skills. It is expected that children with ID will perform better with the positive-valence card set. Results will advance understanding of the effects of environmental supports on performances of individuals with ID, and will have implications for valid assessment of executive skills in this population. (Dr. Michael Carlin) **URSA**

## **Sarah Mozes**

### *Paleoenvironmental Investigation of the Cambro-Ordovician Allentown Dolomite, Hamburg, NJ*

Changing environmental conditions within the marine realm are revealed through various depositional features captured in the rock record. In Hamburg, NJ, a 44-m thick outcrop of the Allentown Dolomite provides a unique opportunity to study these changes in upper Cambrian to lower Ordovician rocks. The Allentown Dolomite reflects a tropical shallow-water environment. In this exposure, the distribution of stromatolites, mudcracks, ooids, and rip-up clasts reveal changing wave energies and water depths over time. Stromatolites and mudcracks indicate an intertidal environment, while ooids and rip-up clasts suggest relatively deeper waters, but where wave action can erode the seafloor. The lower 30 m of the exposure at Hamburg reveals alternating layers of oolites and rip-up clasts with dolomite layers lacking these features. This suggests varying sea levels within a deeper-water environment. The upper 14 m contain mainly layers of ooids with rip-up clasts alternating with stromatolitic layers containing mudcracks, indicating a shallower, intertidal environment. (Dr. Reed Schwimmer) **PSTR**

## **Steven Murkli Jr.**

### *Efficacy of Novel N-(2-(Pyridin-2-yl)Ethyl)Sulfonamides as Antimicrobial Agents*

Over the past decade, the negative impacts of antibiotic resistance have dramatically shaped the focus of research into developing novel antimicrobials. It is therefore of high priority to develop a direct and facile synthetic route that easily allows for the creation of a structurally diverse library of medicinally relevant compounds. Our laboratory has created a new class of pyridinylsulfonamides, which result from the conjugate addition of various 6,5,4, and 3-substituted-2-vinylpyridines with methane-, toluene-, or benzenesulfonamide. Sulfonamides are known inhibitors of the folate biosynthesis pathway, as they compete with a natural substrate of the pathway, para-aminobenzoate, causing depletion of dihydrofolate and subsequent growth inhibition in the bacterial host. We are currently using minimum inhibitory concentration analyses to test the antimicrobial efficacy of these novel compounds. We have demonstrated that a number of these diverse pyridinylsulfonamide compounds display a range of antimicrobial properties in two species of microbes that have known problems with antibiotic resistance, *Escherichia coli* and *Staphylococcus aureus*. Our results are encouraging, as these observed antimicrobial capabilities have the potential to provide crucial insight into the mode and selectivity of inhibition for these novel sulfonamides, and accordingly direct the future design of new antibiotic candidates. (Dr. Danielle Jacobs & Dr. Kelly Bidle) **PSTR**

## **Jonathan Murphy**

### *America's Armor*

The M4 "Sherman" tank was the United States' primary armored fighting vehicle during World War II. At the end of the war, the tank was widely credited for being a crucial component of the Allied

victory over Nazi Germany. However, recent studies of armored warfare claim that the Sherman tank was inferior to German and Soviet designs, leading some to call it a "death trap." My senior thesis investigated the design and combat record of the Sherman to evaluate the vehicle's combat performance and the American military's implementation of the vehicle. Using a handful of secondary sources, as well as records and photographs from the National Archives and Records Administration and personal accounts from tank crews, I found that Sherman tanks were outmatched in one-on-one combat with German tanks due to the U.S. Army doctrine of armored combat. While German tanks were designed to kill other tanks, American tanks were designed to wreak havoc behind enemy lines. Ultimately, it was discovered that when compared head-to-head with German and Soviet designs the Sherman was inferior, yet combat proved the Sherman to be a greatly successful design. (Dr. Joseph Gowaskie) **PNL**

## **Michael Musso**

### *Riparian Land Use and Power in World War II-Era New Jersey*

Riparian and water history has oftentimes been overlooked despite its interesting nature and continued relevance in today's world. Many people do not understand what riparian rights are, let alone the way that government can intervene if they can make a strong enough claim to the lands desired. This paper traces riparian history and the role of both the state and federal government during a specific time of internal and external conflict, World War II. An in-depth look at primary source documents and cases during the war era reveals the state and federal government pushing the extent of their powers to the brink and even over-stepping at times. World War II provided an opportunity for the government at various levels to exercise an increased amount of control that may not have been so easily overlooked had it not been a time of war. (Dr. Brooke Hunter) **PNL**

## **Alexa Nyktas and Breanna Ciberey**

### *Rational imitation and conformity in Asian American vs. Caucasian American Preschoolers*

To determine whether children aged 3-5 are more likely to conform to a group of 3 people or a single model, we conducted a study testing Caucasian and Asian children. We showed children two different videos consisting of models doing two tasks. One task involved crushing a cookie and one involved moving water from one container to another. The children saw two possible tools for each task: one was functional and one was inefficient. Each of the two videos incorporated two clips. In one clip, a single model talked about how she "had to crush a cookie for a pie" or "move water out of her broken sink." She casually demonstrated the functional tool while talking. In the second clip, three models each used the non-functional tool to perform the task. None of these models had the more functional option available. We then asked the children to perform the task. They had the option of either using the inefficient tool that the 3 models had used or the functional tool that they had seen used just once. Results indicated that Asian children were more likely to conform to the majority and use the inefficient tool than were Caucasians. (Dr. Cara DiYanni) **PSTR**

## **Daniel Pace**

### *Effects of Watering Regimes on *Latuca sativa*: Is there an adaptive change that makes a "stronger" plant?*

With growing populations and declining resources agricultural and conservation methods must evolve to meet the growing needs of feeding the world. This experiment sets out to explore strategic water stress periods for *Latuca sativa*, and their effect on net photosynthesis, chlorophyll content, bio-mass, root to shoot ratio, leaf area, leaf numbers, and canopy width. Biomass and net-photosynthesis responded to watering regime changes, while other aspects showed no noticeable effects. Further experimentation with other methods of watering regimes may maximize yields while decreasing the application of water in agriculture where this resource may be scarce. Furthermore

developing such approaches for other crops may help to respond to climate changes in the future helping to meet future resource and agricultural needs. (Dr. Laura Hyatt) **PNL**

### **Farzana Razack**

#### *The Geographic Distribution of Physicians in the United States*

For an effective and efficient delivery of healthcare services, it is important to have an adequate supply of physicians. One of the most crucial factors that must be assessed in order to manage this supply is the geographic distribution of the physician population. Data presented by the American Medical Association (AMA) indicates that there is a large regional variation in the physician distribution. While some areas receive unnecessary medical care, a vast majority of others are being underserved. More specifically, the AMA highlighted that rural areas are experiencing overall shortages in physicians. My research sought to particularly examine this disparity in distribution through the use of physician, state, and county data retrieved from the National Plan and Provider Enumeration System (NPPES), the United States Census Bureau, and the United States Department of Agriculture. Additionally, these datasets were used to investigate how factors including the population without health insurance, population below poverty level, median household income, civilian labor force unemployment, Hispanic/Latino population, and Black/African-American population affected the physician-to-population ratio across counties. (Dr. William Amadio) **URSA**

### **Jessica Stanislawczyk**

#### *Understanding Westminster's Role in the U.S. Cold War Foreign Policy: The State Department Tour of 1956-57*

The US State Department sponsored tours for musicians, often jazz and avant-garde performers, to travel to several continents during the Cold War. Westminster Choir went on a six-month State Department Tour in 1956-57 to 22 countries, but this tour has not received much scholarly attention. This research project will explore how the tour fit into Westminster's mission, examine the experiences of faculty, administration, and students on that tour, and investigate how Westminster could have aided US foreign policy. This will be achieved through study of primary sources in the Westminster archives, secondary sources, and oral histories. (Dr. Eric Hung) **URSA**

### **Kyle Stenger**

#### *An American Dream Come True: Nostalgia and Futurism in the Culture of Walt Disney*

Walt Disney's culture of nostalgia and futurism helped present and promote a bond to the traditional American values of individualism, ingenuity, and free enterprise while advancing progressive themes and practices from the mid-1950s to the mid-1960s. This era is one of the most paradoxical in America's history: the affluent society grew, conformity and suburbia took over, Cold War anxiety was perplexing, and urban decay was becoming more apparent. The nostalgia found in Frontierland, in both Disneyland the television show and the theme park, valued individualism, hard work, and free exploration, while infusing those traditional aspects into the modern world. The Tomorrowland part of the Disney experience popularized both entertaining and educational scientific and futuristic programs that glowed with hopefulness and progressivism. Disney's plan for EPCOT, the Experimental Prototype Community of Tomorrow, would put the natures of both those lands to work to help fight a serious problem growing across the nation—that of urban decay. (Dr. Erica Ryan) **PNL**

### **Jennifer Smolyn and Elizabeth Urban**

#### *A role for gdnf in pronephric duct cell migration in Xenopus laevis*

Anterior to posterior extension of the Xenopus pronephric duct (PD) is complex, consisting of three distinct temporal phases: in the first phase, pronephric and PD tissue segregates from flank mesoderm directly ventral to somites IVVIII; during the second phase, cells migrate throughout the

duct extending it to the axial level of somite XIV; finally, anterior extension of rectal diverticulae (RD) from the cloaca to the posterior tip of the PD is required to complete morphogenesis of a functional conduit for excretory waste. Our studies of axolotl embryos showed that GDNF signaling through the Ret/GFRalpha-1 receptor plays a role in posterior PD extension; we are extending our studies to investigate whether GDNF plays a similar role in *Xenopus*. Here, we show that *Xenopus laevis* expresses two GDNF paralogs similar to the long form of mammalian GDNF, and one alternatively-spliced form. We also show that GFRalpha-1 is necessary for the second phase of PD elongation. In addition, the expression patterns of *Xenopus* *gdnf*, *gfra1* and *ret* indicate that this signaling system could play a role in both PD and RD morphogenesis. Our strategy for testing whether *gdnf* is a PD or RD chemoattractant will also be discussed. (Dr. Julie Drawbridge) **PSTR**

## **Chelsea Stebbins**

### *Paving the Steps to the Celestial Kingdom: The Purposeful Vagueness of the Mormon Prophet on Race*

The Church of the Latter-Day Saints has been faced with turmoil over the years, as some have viewed their doctrine to be quite controversial. My project examines the development of racial doctrine and the role of blacks in the Church since its founding. Special attention is given to the Prophet, Joseph Smith, as it appears that he purposefully crafted an ambiguous racial doctrine, even when responding to violent political pressure. The support that he was intentionally vague in crafting the racial doctrine stems from a series of different reasons, including: political pressure, economic gain and a belief in human rights. After the Prophet's death, the Presidents of the Church who succeeded Smith would change the racial doctrine to alienate blacks from the priesthood, as well as denying them their right to participate in temple ordinances and rituals. Though they were permitted to join the Mormon faith, they could not excel in the Church hierarchy, which caused a great deal of tension amongst the black community. It was not until 1978 that the doctrine was reversed; finally allowing blacks equal participation in the Church. (Dr. Nikki Shepardson) **PSTR**

## **Joy Suslov**

### *Follow the Leader: An Examination of Veteran Music Teachers' Evolving Classroom Management Practices*

Classroom management is a concern of every teacher; from the first day of student teaching until the day they retire, teachers must implement rules and policies based on their own personal philosophies, personalities, and practices to address and prevent disruptive student behavior. While there are numerous research studies discussing what causes behavior problems as well as philosophies and methods of management, the literature addressing how teachers' philosophies are shaped and evolve is surprisingly sparse. The purpose of this phenomenological study is to examine the ways that veteran teachers address behavioral problems in their music classrooms and to discover how their management philosophies and practices have changed over the course of their careers. (Dr. Janet Cape) **PNL**

## **Tyrus E. Takacs**

### *The Effects of Circadian Disruption on the Onset of Obesity and Diabetes in Mice*

Nearly all circadian rhythms entrain (synchronize) to a light-dark cycle. A change in this entraining stimulus evokes a change in the rhythm of the biological clock which varies among different strains of mice. Circadian rhythms influence a variety of physiological functions including metabolism. Repeated shifts of the light-dark cycle can lead to disruptions of the circadian cycle, leading to negative health effects such as obesity and diabetes. Similarly, a high-fat diet can also induce obesity and diabetes in both humans and mice. This study was conducted to determine the degree to which circadian disruption contributes to the onset of obesity and diabetes in C57BL/6J and BALB/cJ mice

and whether chronic circadian disruption exacerbates the effects of diet-induced metabolic disorders. Body weights and glucose levels were measured periodically in mice exposed to diets of varying fat concentrations and mice exposed to varying chronic shifting paradigms in order to establish a basis as to the effects of these treatments on metabolic disorders. Thus far repeated large phase shifts have not yielded changes in body weight, glucose levels, or entrainment of wheel-running rhythms, while high-fat diet resulted in a more rapid weight gain in C57BL/6J mice and not BALB/cJ mice. (Dr. E. Todd Webber) **PSTR**

## **Amanda Vest**

### *Schoenberg's Brettli-Lieder and The Struggle for New Truth at the End of Romanticism*

Arnold Schoenberg's *Brettli-Lieder* belong to the composer's early "Romantic" period and test the balance of romanticism and modernism within a cabaret structure. The set – some say cycle – of eight cabaret songs are on texts drawn from the popular poetry collection *Deutsche Chansons*. Most of the represented poets are near contemporaries of Schoenberg also wrestling with the end of Romanticism. At the self-conscious end of an age, relationships are redefined, language is newly exploited, and a new frontier is identified. Despite simple cabaret forms and relatively unsung poets, the struggle for identity at the confluence of romanticism and modernism is apparent as the *Brettli-Lieder* engage with sexuality and disengage from nature. These songs are full of chromatic symbolism, aurally graphic sexuality, and musical psychology. This paper explores the character of a new idiom evolved within Romanticism, and preparing to part from it, through the music and text of Schoenberg's *Brettli-Lieder*. (J. J. Penna) **PNL**

### *The Effect of Nasal Occlusion on Breathing in Singing*

Deviated septum is a common deformation of the internal and/or external nasal midline causing partial to complete obstruction of the nasal passage. Many studies have examined the impact of deviated septum on nasal resonance. In this study, the KayPENTAX PAS Model 6600 was used to assess the impact of nasal occlusion on breath during singing. One nostril was covered with tape to simulate partial occlusion at the external valve. A nose clip was used to simulate complete occlusion. Six subjects (3M, 3F) participated. Volume, duration, and peak airflow for both inspiration and expiration were compared. Relative to the control condition, a shorter inspiratory duration was observed in the occluded condition for all subjects. (Dr. Kathy Price) **PSTR**

## **Jaclyn Webber**

### *Demography, Time of Year, and Rainfall Effects on Soil Levels of Isothiocyanate in Garlic Mustard Populations*

Garlic Mustard (*Alliaria petiolata*) is a biennial flowering plant meaning that in the first year, juveniles are produced and the second year they bloom into adult plants. Its chemical defense system, made up mainly of sinigrin and myrosinase are crucial to its invasive nature. Myrosinase hydrolyzes sinigrin to create allyl isothiocyanate, a toxic suppressant to the fungi that allows many other plants to grow. It was hypothesized that a decrease in sinigrin (found in the summer of 2012) may be explained by an increase in isothiocyanate. In order to determine this, we measured the amounts of isothiocyanate for each month of the garlic mustard growing season. Isothiocyanate abundance was measured from three age demographics. We found significant results showing that in each age demographic there was an overall increase in isothiocyanate production leading up to the month of June, with one decrease at the end of May and a final decrease at the beginning of July. However, the pattern between age demographics differed. We hypothesize that the reduction in isothiocyanate production is due to rainfall during the days prior to these decreases. These results suggest a model for isothiocyanate release. The reason for the pattern difference between age demographics is still unknown. (Dr. Laura Hyatt) **PSTR**