

# ISCAP

INDEPENDENT SCHOLARSHIP  
& CREATIVE ACTIVITIES PRESENTATIONS



MAY 2, 2018

# ISCAP Day

Wednesday, May 2, 2018

Sweigart Hall

10:15 AM – 3:15 PM

## Schedule At-A-Glance:

<b>10:15-12:00</b>	<b>Undergraduate Research Scholar Awards Session</b>	<b>Sweigart 115</b>
<b>12:00-1:00</b>	<b>Poster Session &amp; Lunch</b>	<b>Sweigart Lobby</b>
<b>1:00-2:00</b>	<b>Panel Sessions:</b>	
	Perspectives in the Present Through Analysis of the Past	<b>Sweigart 118</b>
	Pitch Perfect: Studies of Voices	<b>Sweigart 117</b>
	Updates from Rider Alumni	<b>Sweigart 110</b>
<b>2:15-3:15</b>	<b>Panel Sessions:</b>	
	A Worldview Perspective	<b>Sweigart 118</b>
	Rider Campus: Explore Your Own Backyard	<b>Sweigart 117</b>
	Through Someone Else's Eyes: Understanding Human Relationships	<b>Sweigart 110</b>

### Planned by the URSA Committee:

Jamie Ludwig, Chair  
Paul Jivoff  
Devon Baranek  
Allison Weidhaas  
Emre Yetgin  
Melissa Hofmann  
Hee Young Kim  
Amanda Quist  
Lauren Delisio  
Nathan Hurwitz



Office of the President  
2083 Lawrenceville Road  
Lawrenceville, New Jersey 08648-3099  
P 609-896-5001  
F 609-895-5681  
[www.rider.edu](http://www.rider.edu)

May 2, 2018

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,

Gregory G. Dell'Omo, Ph.D.  
President



Office of Provost and  
Vice President for Academic Affairs  
2083 Lawrenceville Road  
Lawrenceville, New Jersey 08648  
T 609-896-5010  
F 609-896-5242  
dfredeen@rider.edu  
www.rider.edu

May 2, 2018

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 outstanding 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

## Undergraduate Research Scholar Awards Session

Sweigart Auditorium (SWG 115)

10:15 AM – 12:00 PM

Chair: Jamie Ludwig (Chemistry, Biochemistry, Physics and Computer Science)

10:15	<b>Welcome by Provost DonnaJean Fredeen</b>
10:30-10:45	<p><b>Presentations by 2017-18 URSA Recipients</b></p> <p><b>Micaela Bottari</b> (Voice Performance) <i>La Chanson d’Eve and the Layers of Womanhood</i> (Advisor: <b>Eric Hung</b>)</p>
10:45-11:00	<p><b>Gianluca D’Elia</b> (Journalism) <i>Slavery in Our State: Investigating New Jersey’s Role in Cross-Country Human Trafficking</i> (Advisor: <b>Jackie Incollingo</b>)</p>
11:00-11:15	<p><b>Eric Monticello</b> (Management &amp; Leadership, Entrepreneurial Studies, Marketing) <i>SBI (Small Business Institute) Program Analysis</i> (Advisor: <b>Ronald Cook</b>)</p>
11:15-11:30	<p><b>Samantha Ottavi</b> (Biochemistry) <i>The Synthesis and Antibacterial Effects of N-(2-(pyridin-2-yl)ethyl)sulfonamide Derivatives</i> (Advisor: <b>Danielle Jacobs &amp; Kelly Bidle</b>)</p>
11:30-11:45	<p><b>Alexandra Santora</b> (Biology) <i>The Effects of Salt-Stress on Haloferax volcanii</i> (Advisor: <b>Kelly Bidle</b>)</p>
11:45-12:00	<p><b>Announcement of 2018-19 URSA Recipients</b></p> <p><b>Jonnathan Marin</b> (Chemistry) <i>Exploration and Optimization of Carbon-13 Isotopic Labeling Methods for Identifying New Biocatalyzed Transformations of Aryl Halides</i> (Advisor: <b>Jamie Ludwig</b>)</p> <p><b>Paul David Flood</b> (Music, Voice and Music History) <i>Operatic Pursuits of the American Dream</i> (Advisor: <b>Sharon Mirchandani</b>)</p> <p><b>Harish Appiakannan</b> (Biology) <i>Impact of voluntary exercise and diet on glucocorticoid regulation in C57BL6/J mice</i> (Advisor: <b>Todd Weber</b>)</p> <p><b>Shanoy Thompson</b> (Psychology) <i>The Effects of Asian and African American Stereotype Threats on the Ability to Solve Riddles</i> (Advisor: <b>Michael Carlin</b>)</p> <p><b>Andrew Gandham</b> (Finance and International Business) <i>Engaging the Private Sector in Facilitating Institutional and Economic Reconstruction During Post-Crisis Recovery</i> (Advisor: <b>Elizabeth Radziszewski</b>)</p>

## Poster Session

Sweigart Lobby, 12:00 PM – 1:00 PM

- 1. Anthony Ardino** (Health Sciences); Advisor: **Drue Stapleton**  
*Validity Measure of Cadence in Runners*
- 2. Loreena Avery** (Environmental Sciences); Advisor: **Daniel Druckenbrod**  
*Impacts of Captive-born Giant Pandas (*Ailuropoda melanoleuca*) on Understory Species Richness*
- 3. Alina Bardaji** (Environmental Science); Advisor: **Daniel Druckenbrod**  
*Dendrochronological Analysis of Mont Alto, Pennsylvania Black Oak*
- 4. Sydney Bentz** (Biochemistry); Advisor: **Alexander Grushow**  
*Computation of pK a and Charge Densities of Lactones and Lactams*
- 5. Maria Chaves** (Biology and Environmental Science); Advisor: **Hongbing Sun**  
*Attention-deficit- hyperactivity disorder (ADHD) and Demographic and Environmental Factors in the United States*
- 6. Maria Chaves** (Biology and Environmental Sciences); Advisor: **Daniel Druckenbrod**  
*A Dendrochronological Case Study of Ewing Presbyterian Church's Historic White Oak, 1593-1954*
- 7. Alanna D'Avanzo** (BA Psychology, MA Counseling) Advisor: **Cara DiYanni**  
*A Study on Deception and Personality in Children*
- 8. Alanna D'Avanzo** (BA Psychology, MA Counseling), **Amanda Myer** (Elementary Education, Psychology); Advisor: **Cara DiYanni**  
*The Effects of Instrumental vs. Conventional Language on Children's Imitation and Teaching of New Information*
- 9. Barri Deptula** (Biology); Advisor: **James Riggs**  
*Study of Regulatory T Cells (T regs) in a Mouse Model of Ovarian Cancer*
- 10. Timothy Forrest** (Environmental Science); Advisor: **Daniel Druckenbrod**  
*Topography and Tree Growth at the Fernow Experimental Forest, WV*
- 11. Timothy Forrest** (Environmental Science); Advisor: **Kathleen Browne**  
*A Rider Wildlife Guide: Bridging the gap between the digital and natural world*
- 12. Tiffany Girado** (Biochemistry); Advisor: **Kathleen Browne**  
*Environmental Enrichment Project on White Bengal Tigers (*Panthera Tigris Tigris*) at Six Flags Great Adventure*

- 13. Taylor Grieshaber** (Geosciences, Marine Sciences); Advisor: **Hongbing Sun**  
*Salt loading and retention in the Delaware River and Centennial Lake Watershed*
- 14. Imani Guest** (Geosciences); Advisor: **Daniel Druckenbrod**  
*Strengthening a Historical Climate Record in South-Central Pennsylvania with Tree Rings Dating Back 600 Years*
- 15. John Gulliver** (Chemistry); Advisor: **Danielle Jacobs**  
*Synthesis of Enantiomerically Pure Chiral  $\alpha$ -Aryl  $\beta$ -Amino Alcohols from Ethyl Glyoxylate Toward Accessing Novel Bisoxazoline (BOX) Ligands*
- 16. Naomi Jainarine**(Biology); Advisor: **Paul Jivoff**  
*Assessing potential changes in reproductive life histories of female *Sebastes melanops* during changing climates in Newport, Oregon*
- 17. Casey Kaufmann** (Marine Sciences); Advisor: **Gabriela Smalley**  
*Weekly monitoring of abiotic factors and the plankton community in Centennial Lake, New Jersey*
- 18. Jennifer Londregan** (Behavioral Neuroscience); Advisor: **James Riggs**  
*IgD Ligation Promotes B Cell Proliferation in a Model of the Tumor Microenvironment*
- 19. Jonnathan Marin** (Chemistry); Advisor: **Jamie Ludwig**  
*NMR Guided Screening for Identifying Biocatalyzed Transformation*
- 20. Jeffrey Maslanka** (Biology); Advisor: **James Riggs**  
*Identification and Characterization of Transitional B cells in a Mouse Model of Ovarian Cancer*
- 21. Mike Newton** (Elementary Education, History), **Paige Brown** (History), **Rafael Angeles** (History), **Kurt Tomlin** (History), **Dana Killey** (History), **Kevin Innocenzi** (History); Advisor: **Brooke Hunter**  
*World War 1 Centennial and Impact on Lawrence Township*
- 22. Rachel Pereira** (Biology), **Melissa Holley** (ISM and Elementary Education), **Ashley Feliciano** (GLASS); Advisor: **Kathy Browne**  
*Fish Population Assessment of Centennial Lake at Rider University*
- 23. Shauna Puccio** (Voice Performance and Pedogogy); Advisor: **Kathy Price**  
*Weight Lifting and the Effects on the Voice*
- 24. Cassandra Sammarco** (Psychology); Advisor: **Wendy Heath**  
*How Suspect Race, Police Officer Race and Restraint Method Affect Decisions in a Police Brutality Scenario*

- 25. Joshua Schiariti** (Biology and Environmental Sciences); Advisor: **Kathleen Browne**  
*Seasonal Growth Patterns of Invasive Plant Species Purple Loosestrife *Lythrum salicaria* at Centennial Lake*
- 26. Amanda Schopf** (CCS, Sustainability); Advisor: **Kathleen Browne**  
*Data Gathering to Determine the Species on Rider Campus (Lawrenceville)*
- 27. Dana Scioli** (Health Sciences); Advisor: **Drue Stapleton**  
*The Effect of Manual Therapy on Frequency and Pain Intensity in Patients with Migraine*
- 28. Thomas Stein** (Environmental Science); Advisor: **Reed Schwimmer**  
*When up is down and down is up: the case of Gravity Hill, Titusville, NJ*
- 29. Eva Tamsky** (Voice Performance and Pedagogy); Advisor: **Kathy Price**  
*The Effects of an Open Body Posture Routine on Vocal Efficiency and Music Performance Anxiety*
- 30. Meg Tomayko** (Marine Sciences); Advisor: **Gabriela Smalley**  
*Photosynthesis, Respiration, Growth and Grazing of the Plankton Community in Centennial Lake, New Jersey*
- 31. Nicole Donato** (Rider Alumnus, GEMS)  
*Identifying High-Potential Areas For Water-Supply Wells and Estimating Groundwater Recharge in Northern Kenya*



**Panel Session 1:  
Pitch Perfect: Studies of Voices**

**Sweigart 117**

**1:00 PM – 2:00 PM**

**Chair: Melissa Hofmann (Library)**

1:00- 1:20	<b>Kirsten Brown</b> (Voice Performance and Pedagogy) <i>Tonality and Technique: How pitch content affects the way we sing</i> Advisor: <b>Kathy Price</b>
1:20- 1:40	<b>Kelsey Lewis</b> (Voice Pedagogy and Performance) <i>The Effects of Hormone Therapy on the Male to Female Transgender Voice</i> Advisor: <b>Kathy Price</b>

**Panel Session 2:  
Perspectives in the Present through Analysis of the Past**

**Sweigart 118**

**1:00 PM- 2:00 PM**

**Chair: Paul Jivoff (Biology)**

1:00- 1:20	<b>Kenneth Dillon</b> (Political Science and Philosophy) <i>Reading the Zulus' Tolstoy: Multiculturalism in the Modern Age</i> Advisor: <b>Carol Nicholson</b>
1:20- 1:40	<b>Elijah Parkman-Williams</b> (Business Administration) <i>Wild Style Foods</i> Advisor: <b>Lee Zane</b>
1:40- 2:00	<b>Olivia Lee</b> (Public Relations) <i>COMM WEEK: COMM ONE, COMM ALL</i> Advisor: <b>Nancy Wiencek</b>

**Panel Session 3:  
Updates from Rider Alumni**

**Sweigart 110**

**1:00 PM- 2:00 PM**

**Chair: Jamie Ludwig (Chemistry)**

1:00- 1:20	<b>Morgan Kandrak</b> (Chemistry)
1:20- 1:40	<b>Anna Bissinger</b> (Philosophy) <i>The Necessity of Defining Aesthetic Characteristics in Fine Art</i>
1:40- 2:00	<b>Kimyata Valere, PhD</b> (Biology) <i>Mechanisms of Alpha-Defensins in Enhancement of HIV Transmission</i>

**Panel Session 4:  
Rider Campus: Explore Your Own Backyard**

**Sweigart 117**

**2:15 PM- 3:15 PM**

**Chair: Jamie Ludwig (Chemistry)**

2:15- 2:35	<p><b>Loreena Avery</b> (Environmental Science), <b>Olivia Barone</b> (Environmental Studies), <b>Timothy Forrest</b> (Environmental Science), <b>Veronika Geiger</b> (Secondary Ed, Environmental Science), <b>Lauren Margel</b> (Environmental Science), <b>Julia Ragazzo</b> (Environmental Science), <b>Aleesha Rouse</b> (Liberal Studies), <b>Amanda Schopf</b> (Liberal Studies), <b>Michael Shea</b> (Global Supply Chain Management), <b>Joseph Warker</b> (Environmental Science)</p> <p style="text-align: center;"><i>NATURAL RESOURCES OF RIDER UNIVERSITY VIA GOOGLE TOUR</i></p> <p>Advisor: <b>Randy Kertes</b></p>
2:35- 2:55	<p><b>Timothy Forrest</b> (Environmental Science), <b>Joshua Minnich</b> (Environmental Science), <b>Olivia Barone</b> (Environmental Studies)</p> <p style="text-align: center;"><i>A proposed expansion of the Rider Woods trail system</i></p> <p>Advisor: <b>Daniel Druckenbrod</b></p>
2:55- 3:15	<p><b>Alyssa Lintz</b> (History), <b>Matt Triolo</b> (History), <b>Sevren Holtzman</b> (History), <b>Emily Hansen</b> (History and Elementary Ed.), <b>Lauren Dessel</b> (History and Elementary Ed), <b>William D. White</b> (Elementary Ed. and History)</p> <p style="text-align: center;"><i>Fred Vereen &amp; His Contribution to Low Income Housing</i></p> <p>Advisor: <b>Brooke Hunter</b></p>

**Panel Session 5:  
Through Someone Else's Eyes: Understanding Human Relationships**

**Sweigart 110**

**2:15 PM- 3:15 PM**

**Chair: Devon Baranek (Accounting)**

2:15- 2:35	<b>Starlett Hartley</b> (Psychology) <i>Attitudes and Perceptions About Our Social World</i> Advisor: <b>Elaine Scorpio</b>
2:35- 2:55	<b>Joseph Milosz</b> (History and English) <i>Living in a House Made of Cards: Division and War Within the Cherokee Nation 1839-1865</i> Advisor: <b>Brooke Hunter</b>
2:55- 3:15	<b>Shelby Jackloski</b> (Voice Pedagogy and Performance) Rekindling the Voices of a Lost Generation: The Enduring Legacy of Children's Opera in Theresienstadt Advisor: <b>Jennifer Jones Wilson</b>

**Panel Session 6:  
A World View Perspective**

**Sweigart 118**

**2:15 PM- 3:15 PM**

**Chair: Hee Young Kim (Management)**

2:15- 2:35	<b>Suzanne Miller</b> (Global Studies and Political Science) <i>The Algerian Motherland: Maternal Metaphor in Kamel Daoud's Recasting of Camus's The Stranger</i> Advisor: <b>Mary Poteau-Tralie</b>
2:35- 2:55	<b>Ayesha Qureshi</b> (Elementary Education and History) <i>"The Emergence of Islamic Terrorism and The struggle for Chechen Independence, 1990-2015"</i> Advisor: <b>Lucien Frary</b>
2:55- 3:15	<b>Kenneth Dillon</b> (Political Science and Philosophy) <i>Against All 'Necessary Evil': Abdullah Öcalan, Murray Bookchin, and Anarchism in Rojava</i> Advisor: <b>Libby Newman</b>

# PROJECT ABSTRACTS

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

## **Appiakannan, Harish**

### *Impact of voluntary exercise and diet on glucocorticoid regulation in C57BL6/J mice*

It has been shown that increased levels of stress contribute to the development of multiple physical and mental disorders. An increasing number of studies relate voluntary exercise with greater resilience to psychological stress and psychological stress, a process that is highly regulated by the hypothalamic-pituitary-adrenal (HPA) axis. However, not many studies pair diet alongside voluntary exercise to see their combined effects on stress in mice. In this experiment, we aim to investigate how high fat diet and low fat diet can influence stress responses of mice in cages with wheels and cages without. **(Todd Weber) URSA 2018-2019**

## **Ardino, Anthony**

### *Validity Measure of Cadence in Runners*

Providing feedback on running mechanics is commonly used as a method to reduce the risk of injury and restore running etiquette post injury. Acquiring accurate running cadence data (steps per minute) while training outside of laboratory setting is a challenge. While fitness watches may be useful in providing real-time data to coaches, athletes, and clinicians, the validity and reliability of these devices are limited. The purpose of this study was to identify the reliability and validity of cadence measurements obtained from fitness watches. A convenience sample of sixteen NCAA Division I track and field runners participated. Participants were video recorded running on a treadmill while wearing a fitness watch (Garmin, Ltd). Data from the watches were downloaded and compared to manual counts obtained from watching the video recordings. Reliability and validity of the fitness watch compared to the standard (video analysis), which was determined through intra-class correlation coefficient (ICC 3,1 ). Average watch cadence was  $175.2 \pm 8.58$  steps per minute. Average video cadence was  $174.1 \pm 8.22$  steps per minute. The ICC( 3,1 ) value for the watch was 0.95 ( $p < 0.001$ ). Commercial fitness watches provide a valid and reliable measure of running cadence. **(Drue Stapleton) PSTR**

## **Avery, Loreena**

### *Impacts of captive-born giant pandas (*Ailuropoda melanoleuca*) on understory species Richness*

Although giant pandas have been taken off of the endangered species list, they are vulnerable to habitat destruction and fragmentation. Given the significance of giant pandas for conservation biology, there is surprisingly little knowledge regarding the impact giant pandas have on their environment. In this study, we investigated the impacts that giant pandas could have on the understory species richness. In Longchi Natural Forest Park at the top of the Min Mountains of Sichuan Province, China, a temporary learning enclosure serves as a transitional environment for future release pandas. Twenty-nine 10 m<sup>2</sup> plots were marked inside and outside of the enclosure. Within each plot, soil samples were collected and tested for pH, nitrogen, potassium, and phosphorous. Light infiltration, soil permeability, plant surveys, and ground cover were also recorded. Three variables that could change with the presence of a giant panda were compared understory species richness. No strong relationships were drawn between the understory species richness and

soil pH ( $R^2 = 0.04$ ), bamboo ground cover ( $R^2 = 0.17$ ), or canopy cover ( $R^2 = 0.05$ ). The impact of giant pandas on understory species richness remains elusive. (**Daniel Druckenbrod**) **PSTR**

## **Avery, Loreena; Barone, Olivia; Forrest, Timothy; Geiger, Veronika; Margel, Lauren; Ragazzo, Julia; Rouse, Aleesha; Schopf, Amanda; Shea, Michael; Warker, Joseph**

### *Effects of Copayments on Utilization and Costs in the NJ CHIP Program 2015-2016*

Situated in a suburban setting in Mercer County's Piedmont Physiogeographic province, Rider University is home to a wide range of natural resources. The 280-acre Lawrenceville campus is traversed by a stream corridor, impounded to create Centennial Lake for fire control, when the campus was built in the early 1960's. The northern portion of the campus is dominated by the "Rider Woods" visited by Aldo Leopold in 1904-1905 while attending The Lawrenceville School. The mission of the Sustainability Seminar (SUS-400) was to experience and document these resources. The SUS-400 invited guest speakers including an environmental consultant, climate change researcher, soil investigator, wetland expert and a habitat and threatened and endangered species expert. The class also participated in field trips on and off campus. These field trips included soil/geologic investigation, wetland delineation demonstration, a vernal pool evaluation and a visit to a local watershed association discovering innovative sustainable projects. The SUS-400 class is sharing these natural environs via Google Tour Builder. The following tour stops include: 1) topography; 2) land use/land cover; 3) watersheds/streams; 4) soils; 5) geology; 6) wetlands; 7) threatened /endangered species; 8) vernal pools; 9) Rider Woods; 10) birds; and 11) wildlife. It is anticipated that the SUS-400 Google Tour will be updated and enhanced in the future as a part of Rider's Sustainability Minor program. (**Randy Kertes**) **PNL**

## **Bardaji, Alina**

### *Dendrochronological Analysis of Mont Alto, Pennsylvania Black Oak*

The specific tree of study, in this case, was from Mont Alto, Pennsylvania. This black oak (*Quercus velutina*) tree's champion size (largest of its species in Pennsylvania) suggested it could be quite old, so this study was conducted to confirm its age. A sample of this tree was examined over several months. The rings were first counted by hand, determining that this black oak began its life in 1840, making it about 176 years old. The rings' widths were measured using a Velmex TA System to generate a figure illustrating the growth throughout its life and to confirm the age of the tree using crossdating, a standard dendrochronological method (Speer 2009). Once the growth pattern was determined, a general timeline of the events surrounding the life of this tree was produced. It was found that this black oak lived through the American Civil War, the Industrial Revolution until dying in 2017. During its lifetime, the tree recorded injuries to its trunk in 1903 and 1911. It also appears to have undergone a mortality spiral beginning in 2001. (**Daniel Druckenbrod**) **PSTR**

## **Bentz, Sydney**

### *Computation of $pK_a$ and Charge Densities of Lactones and Lactams*

The  $pK_a$  and charge densities of two groups of cyclic ketones, lactones and lactams, were determined computationally. Aqueous  $pK_a$  values were computed by combining solvation energies of neutral and charged species determined by HF/6-31G(d)/PCM and B3LYP/6-31G(d)/SMD methods and the Gibbs energies of the same species in the gas phase that were determined using CBSQB3. Thermodynamic quantities of keto and enol tautomers were also compared. The charge densities of the lactones and lactams were determined using the CHelpG method with the HF/6-31G(d) model chemistry.



Differences in charge densities will be compared to  $pK_a$  results for each species to determine where charges lie after deprotonation. **(Alexander Grushow) PSTR**

## **Bottari, Micaela**

### *La Chanson d'Eve and the Layers of Womanhood*

Gabriel Fauré's late period song cycle *La Chanson d'Eve*, follows the story of young Eve as she is born in and then exiled from Paradise. The narrative Fauré chooses, however, excludes Adam and all mention of traditional sin. Instead, the narrative diverges from religiosity and defines its characters-- Eve, Paradise, and God-- by different textual and musical means. This analysis of *La Chanson d'Eve* focuses on a layer of the whole context. By this I mean that while I recognize it is virtually impossible to separate Eve from the story of creation, there is more to be explored by acknowledging what else she can represent. The goal of this project is to examine a layer of the overall story, and therefore see Eve as a woman that relates to contemporary concepts such as performative gender, societal restrictions, disability, and the freedom of womanhood. **(Eric Hung) URSA 2017-2018**

## **Brown, Kirsten**

### *Tonality and Technique: How pitch content affects the way we sing*

Singing atonal music is, for most young singers, a demanding endeavor. The pitch content and harmonic structure test the musicianship of young singers. But does atonal music present a challenge to a singer's technique as well as their ear? Very little research has been done on this particular issue, but multiple studies demonstrate the difference in our physiological response to tonal and atonal music, as well as the technical response of singers to varying conditions of emotion and familiarity. In this study, 15 female graduate students were asked to perform four short excerpts – two atonal, two tonal. Their singing was analyzed using the Phonatory Aerodynamic System and Voce Vista to examine differences in air flow and vibrato extent. No significant differences were found in airflow measurements or vibrato extent between the atonal and tonal examples. However, there were significant correlations present between tonality, confidence, and consistency of airflow. Furthermore, for each participant, confidence and consistency of airflow were significantly correlated when singing atonal examples, but this correlation was not significant nor as strong for the tonal examples. These interesting results warrant further study, so that young singers and their voice teachers can better understand how best to approach atonal repertoire. **(Kathy Price) PNL**

## **Chaves, Maria**

### *Attention-deficit- hyperactivity disorder (ADHD) and demographic and environmental factors in the United States*

This study measured expectations of Resident Advisors (RAs) at Rider University. Average diagnoses of ADHD of 2003, 2007 and 2011 for children aged 4-17 reported to US Centers for Disease Control and Prevention were studied for the 48 contiguous US states. The 6 states (in the 48 US states) with the highest percentage of current smokers, obesity, proportion of African American and white population, comparing to the 6 states with the lowest percentage of these factors, have 54%, 48%, 31% and 29% higher ADHD risk respectively. In addition, the consumption of sugar-sweetened soft drinks is also shown to be a major factor associated with the prevalence of ADHD in the US. The ADHD risks of 6 states with the highest of average percentages of family income, family size, and percentage of Asian and Hispanic are only 0.63, 0.63, 0.74, and 0.7 times of the ADHD risk of the 6- states with the lowest values of these risk factors. Hence, ADHD is a problem related to genetic, social economic, life style and environmental factors. ADHD occurrences concentrated along the southern and eastern states. Kentucky and Louisiana have the highest ADHD percentage at more than 13% and Nevada and California have the lowest ADHD prevalence rate at ~6% among their 4-17 years old children. **(Hongbing Sun) PSTR**

## **Chaves, Maria**

### *A Dendrochronological Case Study of Ewing Presbyterian Church's Historic White Oak, 1593-1954*

The Ewing Oak is one of three “mighty white oaks” identified through historical documents and local experts as belonging to the Presbyterian Church on Scotch Road of Ewing, New Jersey. In this case study with a cross section catalogued by the New Jersey State Museum in Trenton, we used dendrochronology techniques and historical research to confirm the initial dating done by curators at the museum. Using microscopy instruments to measure tree-rings with micrometer accuracy and dendrochronology-specific statistical software, we compiled and compared this specimen’s unique growth pattern to the regional trends of similar tree-ring data. Observations aligned with the expected growth responses to known historical anthropogenic and climate events. Notable evidence includes an increased growth rate in the early 1700s suggesting a canopy release and correlating with European settlement of the land, documented by a 1708 deed apportioning the land for the establishment of the Presbyterian Church. We determined the age of the tree to be 362 years; it’s first ring beginning in 1593 and it’s last being 1954 after falling during Hurricane Hazel. In addition to contributing to a NOAA paleoclimate database, these results also emphasize the value of place-based learning and dendrochronology in local natural history research. **(Daniel Druckenbrod) PSTR**

## **D’Avanzo, Alanna**

### *A Study on Deception and Personality in Children*

This study explored connections between social desirability and children’s ability and willingness to deceive. In a hiding task, (see Chandler, 1989; Sodian,1991), children were asked to hide treasure under one of three bowls. They were then introduced to a friendly puppet who would let them keep the treasure if she found it, and to a mean puppet who would take it away. The second task (a modified version of Talwar & Lee’s, 2002) was a peeking task. The experimenter explained that she would hide one of the toys and the child would be asked to guess which one she had hidden. The experimenter then turned her back to the child and answered a phone call, giving the child a chance to peek. Finally, the experimenter administered the social desirability questionnaire designed by Crandall and colleagues (1965). Results showed that children who revealed the object’s location to the puppet had significantly higher social desirability scores ( $M = 68\%$ ) than those who did not reveal ( $M = 52.6\%$ ). Children who deceived only the mean animal ( $M = 0.70$ ) scored significantly higher on social desirability than did those who deceived both ( $M = 0.53$ ). Social desirability was unrelated to whether or not children peeked in the second task. **(Cara DiYanni) PSTR**

## **D’Avanzo, Alanna; Myer, Amanda**

### *The Effects of Instrumental vs. Conventional Language on Children’s Imitation and Teaching of New Information*

The purpose of this study is to explore the effects of instrumental versus conventional language on 4- to 6-year- old children’s imitation and teaching of new information. Children were shown a video where the model demonstrated a simple action using an object that was inefficient for the task. In half the videos, the model used instrumental language (“I am going to...”); in the other half, she used conventional language (“We always...”). Children were then given a chance to perform the task themselves, choosing whichever tool they thought was appropriate. Next, they were asked to teach a puppet how to do the task. Social desirability, or children’s willingness to please others, was also measured for each participant. Results showed that there was no relationship between children’s tool choices and the personality variable. However, children were significantly more likely to choose

the modeled (inefficient) tool for themselves, and to teach with it, if the model had used conventional language. **(Cara DiYanni) PSTR**

## **D’Elia, Gianluca**

### *Slavery In Our State: A Look at Human Trafficking in New Jersey through In-Depth Reporting*

The fight against modern-day slavery and human trafficking has changed the meaning of abolitionism in the 21st century. Through multimedia news reporting, this project examines how one of the world's largest and most lucrative criminal industries has affected New Jersey. In 2017 alone, there were 161 reported human trafficking cases in New Jersey — the 13th highest rate in the U.S. Hotline statistics, public records, news clips, state committee reports and interviews with experts and advocates are utilized to explore how the state has responded to the issue, and what work still needs to be done to protect victims and prosecute the perpetrators. The project addresses hot-button issues in human trafficking prevention, such as the national battle against online child sex advertisements and the vulnerability of homeless and LGBTQ youth to sex trafficking, and explores their relevance to New Jersey. The digital news reporting aspect of this work also allows for a better understanding of journalists' role in covering human trafficking, from using proper terminology to remaining victim-centered and following the professional ethics code requirement of minimizing harm. The overall goal of the project is to help readers overcome the misconception that human trafficking only happens overseas, so that they can see it not only as a global problem, but also as a community issue. **(Jackie Incollingo) URSA 2017-2018**

## **Deptula, Barri**

### *Study of Regulatory T Cells (T regs) in a Mouse Model of Ovarian Cancer*

The purpose of my research is to determine if T regulatory cells expand in the spleen and/or peritoneal cavity during ovarian cancer. Regulatory T cells (T regs), characterized by expression of the Foxp3 transcription factor, control immune responses. I used green fluorescent protein (GFP) knock-in mice to track T cells that express Foxp3 by flow cytometry. With additional T cell 2 markers, including CD4, CD44, GITR, CD25, etc., it was possible to track how many T regs are in the healthy mouse and compare those numbers with sick mice. I found that T regs expand more than 15- fold in the peritoneal cavity during cancer without changing very much in the spleen. This likely reflects the immune system attempting to address the inflammation associated with cancer progression. However, this expansion also contributes to the suppression of the anti-cancer immune response. Future studies will determine if deletion of these cells during cancer development permits the immune system to control disease progression. **(James Riggs) PSTR**

## **Dillon, Kenneth**

### *Reading the Zulus’ Tolstoy: Multiculturalism in the Modern Age*

Nobel-winning novelist Saul Bellow was once quoted as saying “Who is the Tolstoy of the Zulus? The Proust of the Papuans? I’d be glad to read him.” A remarkable display of ignorance in its time, but even given how much information made available to us now, are we doing any better today? How can multiculturalism adapt to the ‘age of information’? Recent affairs in American politics—from Cambridge Analytica’s use of Facebook data to create voter profiles President Donald Trump’s designation of Haiti as a ‘shithole country’ and the public support that followed—call the methods by which we learn about one another into question. Given our increased ability to communicate with one another over the internet, we should have a better understanding of each other’s ways of life and cultures, but it seems like oftentimes the opposite is true. I argue that a reaffirmation of the multicultural ideal can help get us back on track at this critical juncture in human history where our

data sharing should match out sense of humanity. Though an assessment of the work of Charles Taylor, Susan Wolf, and Benjamin Lee I offer a way to use multicultural recognition to reestablish earnest learning in the age of information. **(Carol Nicholson) PNL**

### **Dillon, Kenneth**

*Against All 'Necessary Evil': Abdullah Öcalan, Murray Bookchin, and anarchism in Rojava*

Rojava, a de facto autonomous region in northern Syria, is distinct for its government's unique political philosophy. Abdullah Öcalan, founder of Turkey's Kurdish Workers' Party (PKK), offers "Democratic confederalism"—an attempt to prioritize direct democracy, women's liberation, and social ecology through extensive political participation. While a noteworthy departure from most Middle and Near Eastern political philosophy, this is also a radical philosophy that deserves worldwide attention. This paper investigates Öcalan's beginnings in the Marxist-Leninist tradition, examines the impact of Western thinkers like American anarchist Murray Bookchin's influence on his later work, and assesses the impact of his philosophy on the people and public institutions of Rojava. I use a theoretical approach to study the evolution of democratic confederalism and interview journalists and researchers at length to gauge their perspective on the impact of democratic confederalism in Rojava. **(Libby Newman) PNL**

### **Flood, Paul David**

*Operatic Pursuits of the American Dream*

This project will examine the shift in generational perceptions of the American Dream and how the modern version of this ethos is presented by 21st century American operas, particularly Turnage's Anna Nicole and Glass's The Perfect American. The American Dream was coined in the 1930s as a term which signified financial stability and upward mobility. This concept has evolved as a result of the sociocultural and technological advancements within America. According to Jim Cullen, today's American Dream is defined by fame, fortune, and personal fulfillment. Glass and Turnage's operas are emblematic of this modern American Dream through their portrayals of Anna Nicole Smith and Walt Disney. **(Sharon Mirchandani) URSA 2018-2019**

### **Forrest, Tim**

*Topography and Tree Growth at the Fernow Experimental Forest, WV*

This study aimed to explain the variation in the distribution of various tree species observed in the field at the Fernow Experimental Forest in West Virginia using gradient analysis. This multivariate analysis method was developed by Robert Whittaker to examine ecological variation by considering how underlying environmental gradients shape a community. MATLAB, ArcGIS, and SAGA-GIS were used to analyze the effects of aspect, topographic wetness index (TWI), and integrated moisture index (IMI). The hypothesis of this study was that the distribution of populations of different tree species is controlled by physiography and aspect. Two watersheds at the Fernow were selected for analysis, representing areas with different soil moisture and stand age. The tree data used in this study was obtained from the Northern Research Station of the United States Forest Service. Northern Red Oak trees and Tulip Poplar trees both preferred areas that were relatively moist, with aspects more conducive to moisture; but the oaks were dominant in the stand with a southern exposure and the poplars were dominant in the stand with a northeastern exposure. Resilient species such as Red Maple were shown to grow relatively unaffected by the gradients examined in this study. **(Dan Druckenbrod) PSTR**

## **Forrest, Tim**

### *A Rider Wildlife Guide: Bridging the gap between the digital and natural world*

Our campus is home to a variety of different birds, fish, mammals, and reptiles, but many of us may only know of a handful of these organisms. In a world in which technology is integral to our lives, the natural beauty of the world around us is often taken for granted. This project was designed to aid in bridging the gap between the digital world and the natural world. With the help of an immense catalog of photos from Pam Rivera, and bird identifications from Mark Manning, we catalogued a species list of around 100 species. With this information, I have created an online wildlife guide for Rider's campus, with the thought that anyone can see an organism they are not familiar with and quickly learn about habitat, diet, identification, and range, along with some fun facts that are sure to stick. My hope is that making this information easily accessible will allow those of us who are not already looking to learn about the world around us. If my own personal experience is any evidence when it comes to appreciating nature, when it rains it pours. The website constructed in this project will be displayed with a poster. **(Kathleen Browne) PSTR**

## **Forrest, Tim; Minnich, Joshua; Barone, Olivia**

### *A proposed expansion of the Rider Woods trail system*

We are writing a proposal for the renovation and expansion of the trail system in the woods on Rider University's campus. Our proposed trail aims to provide recreational, athletic, educational, and potential financial benefits to the university and the community. We feel our trail proposal is both cost effective and has the smallest impact on the surrounding ecosystem. To determine the ideal parameters that need to be met for optimal use, we met with a group of stakeholders to discuss the size and surface of the trail. When deciding on an optimal trail route, we georeferenced maps of wetlands, threatened and endangered species, Dr. Mary Leck's original trail guide, maps of topography, and maps of streams using ArcGIS to find the best possible route. Our trail covers as much of the woods as possible while also minimizing any necessary permits that would be required for the creation of the trail. We have designed 3 possible trail options, a phase 1 plan designed to be most achievable in the short term, a phase 2 plan for future expansion, and an additional option to be implemented if a walking bridge is constructed over Route 95. **(Daniel Druckenbrod) PNL**

## **Gandham, Andrew**

### *Engaging the Private Sector in Facilitating Institutional and Economic Reconstruction During Post-Crisis Recovery*

This thesis explores how the private sector may help countries develop strong financial institutions and stimulate economic activity in post-crisis recovery through reconstruction, prevention, or mitigation. The increased complexity and severity of crises, including political conflicts as well as natural disasters & environmental degradation, require holistic analysis and innovative solutions. Therefore, this study will extrapolate trends on how crises are impacted by weak institutions and economic activity and vice versa; assess the role of institutional and economic practices in engaging the private sector; identify and evaluate past and ongoing private sector efforts; and pinpoint emerging trends for the 21<sup>st</sup> century. **(Elizabeth Radziszewski) URSA 2018-2019**

## **Girado, Tiffany**

### *Environmental Enrichment Project on White Bengal Tigers (*Panthera Tigris Tigris*) at Six Flags Great Adventure*

The purpose of this experiment was to investigate the behaviors of one male and one female Bengal tiger (*Panthera tigris*) at the Six Flags Safari in Jackson, New Jersey with two environmental

enrichment devices (EEDs). These EEDs consisted of two different scents from natural materials instead of artificial scents used in other studies. It was hypothesized that the EEDs would cause the two tigers to exercise their hunting behaviors and explore their surroundings to a greater degree than without the EEDs. An experimental ethogram (Stanford, 2017) was constructed previous to the beginning of the study so that the frequency of behaviors could be quantified. The data collected was obtained during observations made outside the tiger enclosure, immediately after the placement of an EED. In addition, video was collected for later review. Preliminary analyses suggest that the tigers seemed to be more active with both EEDs, more so with one scent. While this study only produced a small data set, results suggest that natural scents can be used instead of strong artificial scents, like perfumes to improve the quality of life for captive tigers. **(Kathleen Browne) PSTR**

## **Grieshaber, Taylor**

### *Salt loading and retention in the Delaware River and Centennial Lake Watershed*

Given the record snow we had this season, it is estimated that the total road salt application in the Delaware River (DR) watershed is about 20 million metric tons. Reported annual salt retention is about 30% to 40% and 20% to 30% for sodium and chloride respectively. Sodium is more active and retained more by soil colloids and chloride is more conservative and is retained less in soil. In the Centennial Lake watershed just on Rider campus, at least 125 tons of salt (mainly NaCl) were applied this past winter. From the 6-week samples we collected this semester, significant elevations of water conductance were observed each time after snow—ranging from pre-snow storm of 460  $\mu\text{S}$  to post-snow storm of 1200  $\mu\text{S}$ . Our most recent measurements of the sodium concentrations of water from the outlet (near the dam) of the Centennial Lake and an upper stream site near the track field are averaged 13 ppm and 102 ppm on 4/3/2018. The nearly 8-time increases in sodium concentrations in stream water, from after it just enters the school to before it leaves the school, illustrates the significant salt contribution from campus walkways to salt concentrations in the stream on campus.

**(Hongbing Sun) PSTR**

## **Guest, Imani**

### *Strengthening a historical climate record in south-central Pennsylvania with tree rings dating back 600 years*

Tree rings, like fossilized plankton or ice cores, are important proxies of past climates that are able to record different climate signals. These climate signals can then be used by scientists to decipher climate changes. Although much of eastern North America has been well-sampled through dendrochronology, few samples exist from the Cumberland Valley in south-central Pennsylvania. In particular, the oldest sample from the site is a hearth log that has rings dating back to 1373. This sample overlaps with important past environmental events, such as the Medieval warm period, the Little Ice Age, and a possible “megadrought” in the US. The “megadrought” of the 16th century surpassed any drought of the 20th century and is considered to be the most severe and prolonged drought over much of North America for at least the last 500 years (Stahle et al., 2000). Using the wavelet toolbox in MATLAB, this study analyzes the growth history of this tree to determine if an old tree in this region also records those past events. This allows climate signals not readily visible in raw data to be analyzed, and can compare signal statistics across multiple time scales. **(Daniel Druckenbrod) PSTR**

## **Gulliver, John**

### *Synthesis of Enantiomerically Pure Chiral $\alpha$ -Aryl $\beta$ -Amino Alcohols from Ethyl Glyoxylate Toward Accessing Novel Bisoxazoline (BOX) Ligands*

For this project, we plan on synthesizing novel bisoxazoline (BOX) ligands from unnatural, synthetic aryl amino alcohols utilizing low cost, widely available chemicals. These synthesized BOX ligands will be used in a nickel-catalyzed photoredox carbon-carbon coupling reaction, which we hope will influence the three-dimensional configuration of the coupled product. This research is motivated by the importance of a molecule's three-dimensional structure on its corresponding biological activity. (Danielle Jacobs) PSTR

## **Hartley, Starlett**

### *Attitudes and Perceptions About Our Social World*

Openness to experience has been characterized as one of the Big Five Personality Traits, which can be viewed as being innate while also having the ability to change over time. Openness to experience can describe a desire for novelty, new information, and taking on new perceptions that are not your own. This study looks at Rider students and adults to understand the relationship between openness to experience and how it can translate to social and political situations in our real world. The Integrative Complexity Scale and the Universal Diverse Orientation Scale are both used to measure characteristics of being open to new social situations, including being open to diversity and having cognitively integrated world views. Scores on these scales are compared to scores of Right-Wing Authoritarianism. Lastly, this survey includes the Ascent of Man Scale and includes current scenarios, including topics on immigration, nuclear warfare, and gun regulation to see if scores on these scales can translate to making certain policy decisions and social decisions about how civilized people find different groups to be. By understanding how personal dispositions and cognitive world views can influence our social relationships, we can gain more insight on issues of discrimination, prejudice, and biases. (Elaine Scorpio) PNL

## **Jackloski, Shelby**

### *Rekindling the Voices of a Lost Generation: The Enduring Legacy of Children's Opera in Theresienstadt*

Operas that have realistic themes provide children with a unique educational opportunity to make connections to their own lives and society as a whole. Studying opera allows children to explore their creative selves, and introduces them to various stories with dynamic plots and moral lessons. As a former elementary school music teacher, I advocate for the inclusion of operas with realistic themes in the public school elementary music curriculum, either by producing a full-length children's opera, or creating a wrap-around unit on children's opera. For example, Hans Krása's children's opera *Brundibár* continues to captivate audiences seventy-five years after its premiere in the Theresienstadt ghetto as Nazi propaganda. If produced with attention to the original context, *Brundibár* inspires children to have hope for the future, while simultaneously acknowledging its tragic origin. Out of the 11,000 Jewish children who were imprisoned at Theresienstadt, historians estimate that only 250 survived. By producing *Brundibár*, Hans Krása provided the children with a voice and a lasting legacy. In this paper, I argue that current productions of *Brundibár* function as a mobile Holocaust memorial and therefore must be performed with acknowledgement to the historical context, even though the opera originally furthered the Nazi agenda as propaganda. (Jennifer Jones Wilson) PNL

## **Jainarine, Naomi**

### *Assessing potential changes in reproductive life histories of female *Sebastes melanops* during changing climates in Newport, Oregon*

As natural systems in the North Pacific change due to anthropogenic induced anomalies, such as the marine heat wave from recent El Nino events, managers of economically important fisheries must monitor how stocks are adapting in terms of reproductive success. Specifically, *Sebastes melanops* (Black Rockfish), a long-lived rockfish species will be evaluated in order to understand the understudied reproductive life histories of female black rockfish in changing environmental conditions (in terms of temporal and latitudinal variability). Black Rockfish consist of over 50% percent of the landings in the bottom fishing industry and contribute a great deal to the local environments and economies. Biological samples were taken by extracting otoliths and gonads from the carcasses of recreationally landed fish. The otoliths were analyzed to determine age and the gonad histology helped indicate maturation state. These data were used to investigate at what age/length females are becoming mature and to examine possible correlations with differing environmental conditions. **(Paul Jivoff) PSTR**

## **Kaufmann, Casey**

*Weekly monitoring of abiotic factors and the plankton community in Centennial Lake, New Jersey*

Planktonic organisms are a vital part of any aquatic ecosystem and form the basis of the food web. They are affected by abiotic and biotic factors and change with the seasons. We monitored various abiotic parameters and the plankton community found in Centennial Lake, New Jersey. We observed how these parameters were influenced by the change of seasons from late summer to fall. Air and water temperature decreased from September to November, while turbidity increased. Dissolved oxygen and pH varied over time, but were positively correlated with each other and with bacterial abundance. Inorganic nutrients fluctuated, but only nitrate was correlated with precipitation. Chlorophyll decreased over time and was mostly dominated by small phytoplankton, especially late in the season. The plankton community consisted of a diverse assembly of phyto- and zooplankton. It was difficult to discern a persistent pattern as their abundances spiked repeatedly and at different times. Generally, most heterotrophs spiked earlier in the season and decreased towards the end. Our study shows that Centennial Lake is healthier than its reputation among students suggests. It supports a complex and diverse ecosystem despite its small size, and contains a wide variety of organisms that support the local food web. **(Gabriela Smalley) PSTR**

## **Lee, Olivia**

*COMM WEEK: COMM ONE, COMM ALL*

COMM WEEK: COMM ONE, COMM ALL occurred from November 27 th – December 1 st , 2017. This 5-day communication convention, hosted through the Department of Communication and Journalism, was intended to benefit students with professional development opportunities inside and outside of the classroom. Bringing this opportunity to Rider University was important because it highlighted the interests of students within the department and it set the university apart from other institutions with a celebration that encouraged originality and professionalism. The theme of the celebration was “How to Embrace Your Superpower,” which was launched with a screening of Marvel’s Wonder Woman. The main event was a Wonder Women’s Leadership Panel where the importance of being your own superhero and reaching personal goals was discussed. Throughout the week, students networked with professionals to learn more about journalism, graphic design, political speech writing, public relations and ways to enhance their professional skills. In addition, there was an original music video contest, an alumni mixer and tour of the local station 94.5 PST Radio. All the materials have been archived for reproduction in the future, which gives the chance for future events to occur. **(Nancy Wiencek) PNL**



## **Lewis, Kelsey**

### *The Effects of Hormone Therapy on the Male to Female Transgender Voice*

Hormone treatment is commonly pursued by transgender individuals to reduce gender dysphoria, an issue which not only involves physical appearance, but also the characteristics and perception of the voice. Bultynck et al. (2017) conducted a study on perception of the voice during cross-sex hormone therapy and concluded that in the first 12 months of treatment, self-perception greatly improved in transgender men and women. The purpose of this study is to observe the acoustical and perceptual effects of hormone treatment on the male to female (MTF) transgender voice during the first three months of hormone treatment. This research currently exists as a case study of one 22 year-old MTF individual. Research involves a series of vocal assessments and interviews. Data includes sung vocal range, fundamental frequency of speaking voice, assessment of characteristics using computerized voice analysis software, and qualitative interviews focusing on perception of self and the voice. Results conclude that hormone therapy does positively influence measurable qualities such as vocal range as well as self-perception and confidence level of the participant. Future research will involve deeper acoustical analysis of formant values in transgender singers, and will serve to further develop existing pedagogical methods for transgender singers. **(Kathy Price) PNL**

## **Lintz, Alyssa; Tiolo, Matt; Holtzman, Sevren; Hansen, Emily; Dessel, Lauren; White, William D.**

### *Fred Vereen & His Contribution to Low Income Housing*

Our group is researching Fred Vereen and his contribution to Eggerts Crossing Village as well as paving the way for low-income housing. We are looking into the archives from the library to see what had to be done in order for Eggerts Crossing to be home for many families. In addition, we are exploring the history of the area that surrounds of Eggerts Crossing. **(Brooke Hunter) PNL**

## **Londregan, Jennifer**

### *IgD Ligation Promotes B Cell Proliferation in a Model of the Tumor Microenvironment*

Potent immune suppression within tumor microenvironments (TMEs) is a hallmark of cancer. We model the TME by culture of C57BL/6J peritoneal cavity (PerC) cells. PerC cells include a significant fraction of immune-suppressive macrophages that, depending on the form of activation, temper T and B cell proliferation. PerC B cell responses to both BCR (F[ab']<sub>2</sub> anti-IgM) and TLR4 (LPS) ligation are suppressed. Here, we show that IgD receptor ligation (anti-IgD) induces B cell proliferation in this suppressive environment. Unlike other forms of B cell stimulation, the anti-IgD response is optimal at high PerC cell concentrations. Both polyclonal anti-IgD and monoclonal anti-IgDa (AMS 9.1) reagents trigger B cell proliferation. Strain comparisons revealed better responses with PerC cells from BALB/c ("Th2-like") mice. Interestingly, while IL-4 enhanced spleen B cell proliferation, this cytokine suppressed the PerC cell response to IgD ligation. We are testing other cytokines to optimize this response and are assessing the impact of IgD ligation on T cell survival in our TME model. These studies may inform strategies to enhance lymphocyte activation within TMEs. Supported by NIH AREA R15CA173688. **(James Riggs) PSTR**

## **Marin, Jonnathan**

### *NMR Guided Screening for Identifying Biocatalyzed Transformations*

Carbon-13 labeling strategies provide an important tool for organic chemists. Through enrichment of the carbon-13 isotope, organic substrates are easily traceable via nuclear magnetic resonance (NMR). This provides a method of evaluating reaction mechanisms, metabolic transformations and more.

Methods to incorporate carbon isotopes are limited by access to affordable and reactive reagents. Our lab has optimized two name reactions to efficiently label aromatic substrates for use in biocatalysis discovery. The Rosenmund-von Braun reaction, using  $K^{13}CN$  as the carbon-13 source has allowed for the successful labeling of a small library of molecules. In addition, the Negishi coupling reaction uses  $^{13}CH_3I$ , a safer and cheaper source of carbon-13, also serves as an effective labeling strategy. With carbon-13 labeled substrates in hand, we have embarked on a discovery effort to identify new, biocatalyzed transformations through “feeding” labeled substrates to whole-cell bacterial cultures. (Jamie Ludwig) **PSTR**

### **Marin, Jonnathan**

#### *Exploration and Optimization of Carbon-13 Isotopic Labeling Methods for Identifying New Biocatalyzed Transformations of Aryl Halides*

Carbon-13 labeling strategies provide an important tool for organic chemists. Through enrichment of the carbon-13 isotope, organic substrates are easily traceable via nuclear magnetic resonance (NMR). This provides a method of evaluating reaction mechanisms, metabolic transformations and more. Such methods are limited by access to affordable and reactive reagents. We have optimized two name reactions for labeling aromatic substrates to aid our biocatalysis discovery efforts. We will expand upon this work by functionalizing our labeled molecules to model common biosynthetic precursors. This will enhance the probability of discovering new biocatalytic transformations that will be detected via this isotope labeling method. (Jamie Ludwig) **URSA 2018-2019**

### **Maslanka, Jeffrey**

#### *Identification and Characterization of Transitional B cells in a Mouse Model of Ovarian Cancer*

Early biomarkers of ovarian cancer are needed for timely disease detection. Monitoring alterations in the immune system might be informative in this regard. Our research has shown that ovarian cancer depletes lymphocytes but intriguingly leaves a particular B cell subset intact. My research proposes to explore the status of the precursors for these cells during ovarian cancer development. I will collect sera to analyze antibody production and use flow cytometry to characterize cellular changes during cancer development. These studies will provide insight as to whether monitoring B cell hematopoiesis might inform early diagnosis of ovarian carcinoma. (James Riggs) **PSTR**

### **Miller, Suzanne**

#### *The Algerian Motherland: Maternal Metaphor in Kamel Daoud's Recasting of Camus's The Stranger*

Many francophone writers from the former French colonies, or whose families have migrated to France from those colonies, have crafted what are called “postcolonial remakes,” texts that attempt to re-appropriate and correct cultural heritage and history as expressed in stories and novels written by French writers. One such rewriting, Kamel Daoud's *Meursault, contre-enquête* (The Meursault Investigation) retells the story of the unnamed anonymous Arab killed in Albert Camus's famous novel, *The Stranger*, through the eyes of his younger brother. While much has been written about *The Stranger* over the many decades since its publication, especially in terms of its relationship to existential themes, Daoud's recent story is the first attempt to imagine the identity of both the anonymous Arab who is killed by a Frenchman on a beach in Algeria in Camus's novel, and more importantly, that of his widowed mother and younger brother left to pick up the pieces. This paper argues that Daoud uses the figure of the mother; the first character mentioned by both narrators in

the two novels, as a metaphor for a broken, forgotten Algerian motherland. **(Mary Poteau-Tralie)**  
**PNL**

### **Milosz, Joseph**

#### *Living in a House Made of Cards: Division and War Within the Cherokee Nation 1839-1865*

Much of the scholarship about the Cherokee Nation centers upon their removal to the west and the tragedy of the Trail of Tears. Little attention is paid to the Cherokee in the aftermath of removal and the tensions and divisions that arose from this horrible chapter in American and Native American history and especially the impact that these conflicts had on decisions regarding the Civil War. My research focuses on the factions that defined the Cherokee in this era through the eyes of their primary leaders; John Ross and Stand Watie. An analysis of primary source documents reveals in these men an inclination towards power and revenge that often lead to rash decisions. In addition to providing insight into a neglected aspect of Cherokee history, my research expands Civil War scholarship into the war's less-covered western theater. **(Brooke Hunter) PNL**

### **Monticello, Eric**

#### *SBI (Small Business Institute) Program Analysis*

In this research study, the researcher analyzed small business outcomes from implementing student team consulting recommendations from projects done between 2000 and 2016 through a university program. By using personal interviews and surveys, the researcher discovers what recommendations have been implemented, or are being implemented as well as the outcomes of these recommendations on small business. This information can demonstrate the effectiveness of student team consulting projects and show other businesses how the Small Business Institute program can help them start, grow and/or maintain economic success in their competitive environments. In addition, the researcher compares the different types of consulting projects to see if certain types make more sense for student team consulting. **(Ronald Cook) URSA 2017-2018**

### **Newton, Mike; Brown, Paige; Angeles, Rafael; Tomlin, Kurt; Killey, Dana; Innocenzi, Kevin**

#### *World War 1 Centennial and Impact on Lawrence Township*

The purpose of this project was to examine military and home front aspects of World War 1 and the lasting effects it had on Lawrence Township. The information that had been examined includes percentage of men serving in the war from the county and the background profiles of particular soldiers. In addition, aspects of the home front include home guard, women and children's part in the war and soldiers vocational schools. All of these aspects together create the impact of World War 1 on Lawrence Township. **(Brooke Hunter) PSTR**

### **Ottavi, Samantha**

#### *Choline Geranate Deep Eutectic Solvents Exhibiting Unique Antimicrobial Activity Against Gram-Positive Bacteria*

Deep eutectic solvents (DESs) have enjoyed a recent upsurge in chemical research due to their capacity to behave as green solvents, as well as their potential applications in catalysis, organic synthesis, transdermal drug delivery, and biofilm eradication. The DES choline geranate was previously found to be an extremely effective antimicrobial against several types of gram-negative bacteria, yet its efficacy against gram-positive bacteria was significantly less robust. In an effort to improve choline geranate's antimicrobial activity against gram-positive bacteria, 16 novel choline geranate derivatives were synthesized by replacing the choline cation. The antibacterial properties of

these derivatives were assessed in triplicate via minimum inhibitory concentration (MIC) against both gram-negative *Pseudomonas aeruginosa* and gram-positive *Staphylococcus aureus*. All derivatives showed modest to no activity against *P. aeruginosa*, the most powerful exhibiting an MIC value of 5 mg/mL. On the other hand, these derivatives were far more powerful against *S. aureus*, with the most potent derivatives having MIC values between 0.75 and 5 g/mL. Future studies will evaluate the antibacterial properties of these choline geranate derivatives against gram-variable bacteria, as well as their potential role in biofilm prevention and eradication. **(Danielle Jacobs, Kelly Bidle) URSA 2017-2018**

## **Parkman-Williams, Elijah**

### *Wild Style Foods*

Wild Style Foods is a food truck that is designed to bring multiple cultures together for a satisfying combination of cultural foods. This food truck will feature many different spins for different cultured food. Our customers are people who enjoy eating new types of food and have an affinity for different cultural cuisines. Our food trucks would be stationed at different locations within New York City. Locations would include college campuses within the city, such as Columbia University and New York University, lively night hubs that draw crowds of people during the night, and just on the outskirts of high foot trafficked New York must sees, such as Time Square and Madison Square Garden. The reason why is because college students, night owls, and tourists are our desired target market. Trying new cultured food can help enhance the global perspectives of these customers and can reinforce their commitment to help make the world a more culturally accepting place. A main factor is because restaurants are expensive to operate and maintain certain standards. Wild Style Foods will help lower startup costs and will make our business mobile to accommodate location preferences, erupting a new wave of culturally indifferent food across America! **(Lee Zane) PNL**

## **Pereira, Rachel; Holley, Melissa; Feliciano, Ashley**

### *Fish Population Assessment of Centennial Lake at Rider University*

This study investigated possible changes in fish populations of Centennial lake at Rider University. In September 2014 the SCI 100 class studied the fish population via electrofishing and net seining with the help of NJ Fish and Wildlife organization. They documented five fish species (Largemouth Bass-LMB; Bluegill -BG; Pumpkinseed-PS; Brown Bullhead Catfish; American Eel) and determined the lake should not be fished due to none of the fish being “quality length”, or proper reproductive size. Fall 2017 SCI 100 class repeated the electrofishing study in 2017 and documented the same five fish species with the addition of many young of the year for four species. Analyses of LMB, BG and PS population size distributions suggest that they are still out of balance although PSD calculations for quality length and preferred length are better. There was a higher number of bluegills plus pumpkinseeds (“Sunnies”) than largemouth bass, however, the largemouth bass population had a higher biomass than the bluegills. The addition of habitat for bass may help bring the lake back to a more balanced population ratio. **(Kathleen Browne) PSTR**

## **Puccio, Shauna**

### *Weight Lifting and the Effects on the Voice*

The purpose of this research was to test the voice before periods of heavy weight lifting, and then after periods of heavy weightlifting. The researcher hypothesized that weight lifting added extra fatigue to the vocal folds as a result of the folds adducting when the body is lifting something heavy.

The trials for this current research were taken over the span of one week, where no extra physical activity was added to the subject's daily routine. The pitches B3, G4, and A5 - full chest, middle, and head voice – were sung on an [a] vowel. The trials post-workout were also performed over the course of one week. The subject performed twenty minutes worth of weight lifting for three major muscle groups: legs, abdominals, and arms. The subject also had the constant of lifting an extra twenty pounds for each area of the body in addition to her own body weight; a total of sixty minutes. Once the weight lifting was complete the same pitches and vowels were sung into VoceVista. The researcher's hypothesis was supported by this research: the spectrograms revealed far more noise in the sound as well as inconsistent vibrato with the added tension from performing the extra heavy lifting. **(Kathy Price) PSTR**

## **Qureshi, Ayesha**

*The Emergence of Islamic Terrorism and The struggle for Chechen Independence, 1990-2015*

This project consists of an overview of the conflict in Chechnya, which is a small country in the North Caucasus region. For centuries the Chechen people have been in fighting for their nationalism and Independence under Russian oppression. Conflict reached a boiling point in the late 1990's and into the 21 st century with the Russo-Chechen wars. These wars resulted in bringing Islamic Terrorism into the region leaving a devastating impact on the people of the North Caucasus, the Chechens, and their cause. What this project does is provide that long history of conflict and analyze how the Chechens came to use this level of terror for their cause. More importantly, this project aims to prove that although prominent terrorists in the region use Islam to justify violence, the real motive is the Chechen case for Independence. The project also dispels stereotypes about the people and the religion and looks into future implications for the people of Chechnya. **(Lucien Frary) PNL**

## **Sammarco, Cassandra**

*How Suspect Race, Police Officer Race and Restraint Method Affect Decisions in a Police Brutality Scenario*

Online participants (N = 189) read two newspaper articles about a convenience store robbery and viewed a suspect composite created using FACES® software. The newspaper articles, the suspect composite and a photo accompanying one of the articles were used to vary the suspect's race (Black, White), an arresting police officer's race (Black, White), and the manner in which the suspect was restrained (handcuffs, gun). While participants thought it was more likely that the White suspect robbed the store than the Black suspect, the Black suspect who was restrained with a gun was assigned the longest sentence. **(Wendy Heath) PSTR**

## **Santora, Alexandra**

*The Effects of Temperature Stress on Caspase-like activity in Haloferax volcanii*

Cysteine-aspartate specific proteases, or caspases, are enzymes that function to catalyze programmed cell-death in multicellular organisms. Until recently, activity of this nature had been recognized in two of the three domains of life (Eukarya and Bacteria) but had not been recognized in the Archaeal domain. However, based on our ongoing work, evidence of caspase-like activity in Archaea has now been identified. This is of great interest as it indicates an early evolutionary advantage for this activity in primitive life. Our on-going research indicates that Haloferax volcanii (HV), a "salt-loving" archaeon, exhibits high levels of caspase-specific activity that is enhanced by salt stress. Given the involvement of caspases in the cellular stress response in higher organisms, we were interested in further examining how a variety of abiotic stressors would affect caspase activity in HV. Here we investigated the extent of caspase-like protein activity in response to temperature

stress in wild-type and targeted genetic knockout strains of HV and found that caspase-like activity was present under optimal growth conditions and in general decreased in the knockout strains. These findings, in conjunction with our other data, support our hypothesis that this caspase-like protein is playing a role in the cellular stress response in Archaea. **(Kelly Bidle) URSA 2017-2018**

## **Schiariti, Josh**

### *Seasonal Growth Patterns of Invasive Plant Species Purple Loosestrife *Lythrum salicaria* at Centennial Lake*

Invasive species are non-indigenous organisms, whose interactions have negative effects on native communities and ecosystems as a whole (Invasive.org, n.d.). The discovery and spread of invasive *Lythrum salicaria* on Centennial Lake after a lake buffer restoration prompted remediation methods to combat the plant. Rider University implemented a popular method of bioremediation utilizing the European beetle, *Galerucella* spp. This study sought to monitor the reaction to predation stress over time in a single growth season, and to compare the responses of more heavily and less heavily predated purple loosestrife. Data was gathered and analyzed on the number of stems in each of eight quadrats, as well as damage to the leaves. The height of the five tallest stems from each quadrant was recorded, and the plants were viewed for inflorescence. A visual count of the beetles was taken. Preliminary analyses show differences in the height and growth patterns between heavily and less heavily predated sites. Three out of four of the less heavily predated plants grew more stems with fluorescence than the four heavily predated. Further analysis will be presented. **(Kathleen Browne) PSTR**

## **Schopf, Amanda**

### *Data Gathering to Determine the Species on Rider Campus (Lawrenceville)*

The goal of my SUS internship was to document the species found on the Lawrenceville campus at Rider University to determine if the campus provides a sustainable habitat. This was done by using photographs taken over the span of 6 years, interviews with Rider staff and alumni, and observations by Mark Manning ('01). Results show an increase in species diversity and frequency occurrence shown in the photograph collection which was supported by my interview with photographer Pam Rivera. Any species that I found that were uncommon relative to our area were confirmed by Mrs. Rivera as being found on campus. Some examples include an osprey, a snapping turtle laying eggs and a male Egyptian goose on campus that mated with a mallard. I hypothesize that the increase in species is a result of several landscape developments. Initially, the lake edge restoration created a habitat capable of supporting a variety of species. The new landscaping surrounding North Hall has attracted hummingbirds, goldfinches and a variety of butterflies. The steps Rider University has taken to improve attractive landscapes has increased viable habitats, possibly resulting in an increase in species diversity. **(Kathleen Browne) PSTR**

## **Scioli, Dana**

### *The Effect of Manual Therapy on Frequency and Pain Intensity in Patients with Migraine*

Clinical Scenario: Migraine is a disease affecting 12-15% of the adult population. The pulsating headache, nausea, and photophobia associated with migraine can be debilitating to the patient resulting in reduced quality of life. The standard of care for migraine involves the use of pharmaceuticals as a treatment and preventive approach. Due to neck pain and decrease cervical range of motion, migraine patients utilize physical therapy for treatment and prevention of migraine. A comprehensive search of the literature from 2007-2017 was conducted to answer the clinical question: in patients with migraine, what is the effect of manual therapy on pain intensity and

frequency of headache? Summary of Key Findings: 67% of the studies included in this critical appraisal revealed a statistically significant improvement in factors such as pain intensity, HRQoL, and duration I groups that paired manual therapy with medication compared to medication alone. One study did not find statistically significant results that manual therapy has additional benefits than medication alone. However, significant reductions in frequency and intensity were observed as well as increased patient satisfaction. One study found increased cervical range of motion in manual therapy treated patients as well. Clinical Bottom Line: There is strong evidence to support the use of manual therapy as a treatment for migraine (**Drue Stapleton**) **PSTR**

## **Stein, Thomas**

### *When up is down and down is up: the case of Gravity Hill, Titusville, NJ*

Gravity hills are optical illusions; they are caused by our brains trying to interpret spatial relationships among surface features. This illusion typically occurs along gently-sloping roadways where our eyes incorrectly determine the dip direction of the road. Over 100 so-called “gravity hills” are recognized around the world and three of these are found in NJ. But what are those spatial relationships that trick our visual perception? To answer this, a Topcon Auto Level was used to survey a portion of Pleasant Valley Road, Titusville, NJ, where such an illusion occurs. Precise elevation data were recorded for both the road and the adjacent field. The road gradient varied from 0.01 (0.6° slope) to 0.05 (2.9° slope). The field gradient was steeper than the road gradient, which likely contributes to the illusion. The difference in gradients plays a trick on our eyes because the horizon is not seen. Consequently, we visually use the land surface as a substitute for the horizon on which to base our interpretation of slope. As a result, we “see” the incorrect dip direction due to the “replacement” of the horizon. (**Reed Schwimmer**) **PSTR**

## **Tamsky, Eva**

### *The Effects of an Open Body Posture Routine on Vocal Efficiency and Music Performance Anxiety*

Music Performance Anxiety (MPA) is widespread amongst students and professional musicians alike, but little has been done in higher education to formally address this phenomenon. Despite some research on the physiological effects of MPA on musicians, possible strategies to combat MPA, and the psychological effects of body posture, as far as the author of the present study is aware there has not been a study on the connection of body posture on the physiological or psychological effects of MPA. Therefore, the purpose of the present research was to investigate the effects of open body posture on vocal efficiency and music performance anxiety when tested over a four-week program. Seven graduate students studying vocal performance implanted a four-week open body posture program. Participants completed two minutes of open body posture before every practice session and five minutes before any public performance. There was a significant relationship between the consistency of participants in practicing open body posture over the four-week program and their reported decrease in anxiety. Overall, participants reported they were more confident and their vocal production was marginally more efficient than usual while their anxiety tended to be less problematic than usual. (**Kathy Price**) **PSTR**

## **Thompson, Shanoy**

### *The Effects of Asian and African American Stereotype Threats on the Ability to Solve Riddles*

This study integrates stereotype threat research with the riddles study of Bar-Hillel, Noah and Frederick (2018). The purpose is to manipulate riddle solution via implicit activation of stereotypes. It

is expected that activating a particular racial stereotype will hinder riddle solution. Participants will be 127 students of Rider University or those recruited via Mechanical Turk. Each will be randomly assigned to a group (Asian or African American reader) and presented with African American-themed, Asian-themed, and control riddles. This study will illustrate how stereotypes can delay or stop one's ability to form nondiscriminatory solutions to global issues. **(Michael Carlin) URSA 2018-2019**

## **Tomayko, Meg**

### *Photosynthesis, Respiration, Growth and Grazing of the Plankton Community in Centennial Lake, New Jersey*

Lakes are important for local ecosystems. They are home to many organisms and contribute to biodiversity, including at the microbial level. The abundance and activity of these microbes also play an important role in carbon cycling. The purpose of this experiment was to observe the seasonal change in biological rate processes associated with the microbial plankton community of Centennial Lake on Rider University's campus. Photosynthetic and respiration rates were determined using light/dark bottle experiments on Sept. 20-21 st and Oct. 11-13 th . Growth rates of and feeding rates on phytoplankton were measured using the dilution technique on Sept. 27-28 th and Oct. 18-19 th . Nutrient limitation in phytoplankton was studied with nutrient addition experiments by adding nitrate, phosphate, or both together on Sept. 27-28 th and Oct. 18-19 th . Our results showed that photosynthetic rates, respiration rates, phytoplankton growth rates, and feeding rates on phytoplankton were all higher in September compared to October. Furthermore, growth rates in October were negative, indicating declining phytoplankton populations. The nutrient experiments showed that phytoplankton growth was potentially limited by nitrogen in September but nutrients were not limiting in October. These results can be explained by the changing seasons: temperature and sunlight decreased over time, affecting photosynthesis, respiration, and feeding dynamics.

**(Gabriela Smalley) PSTR**