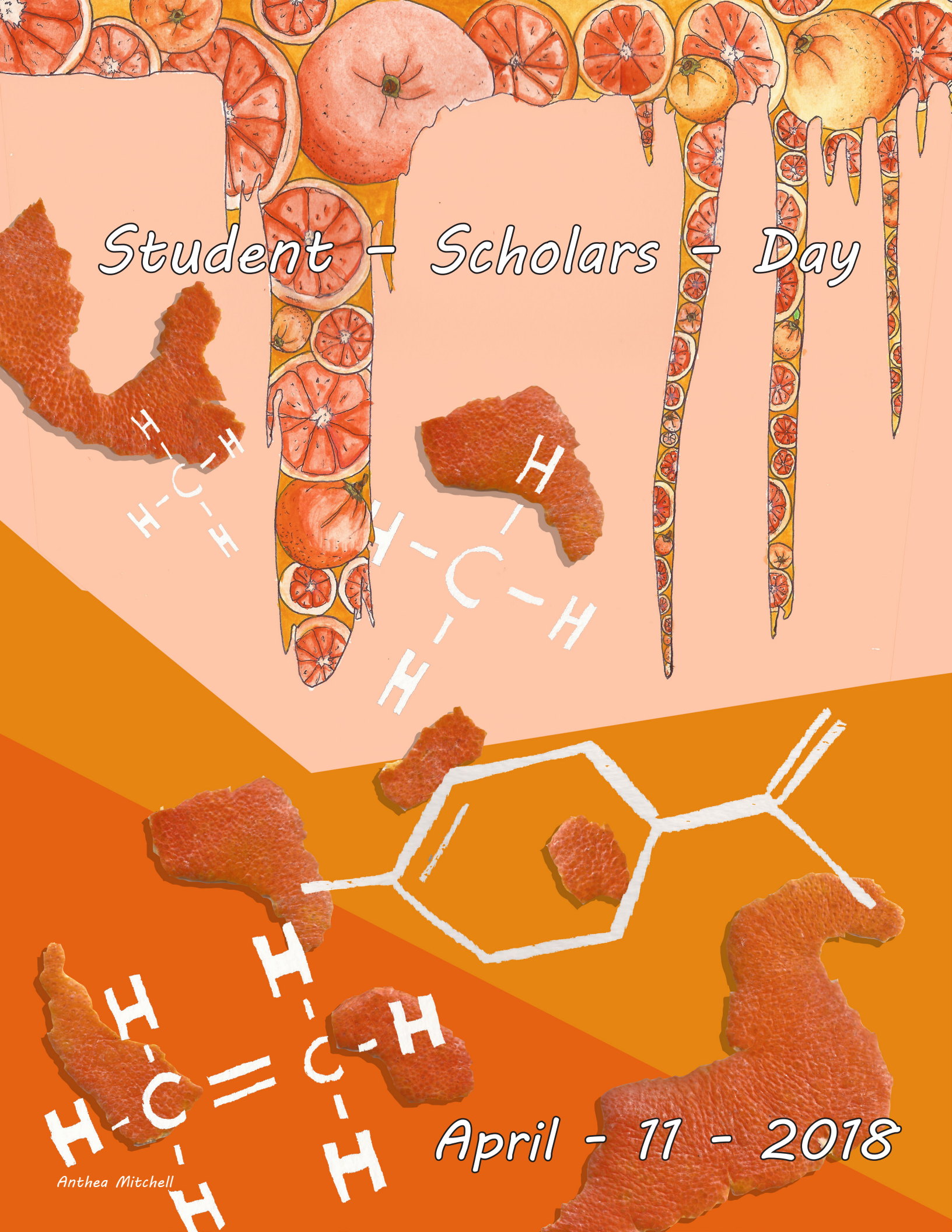
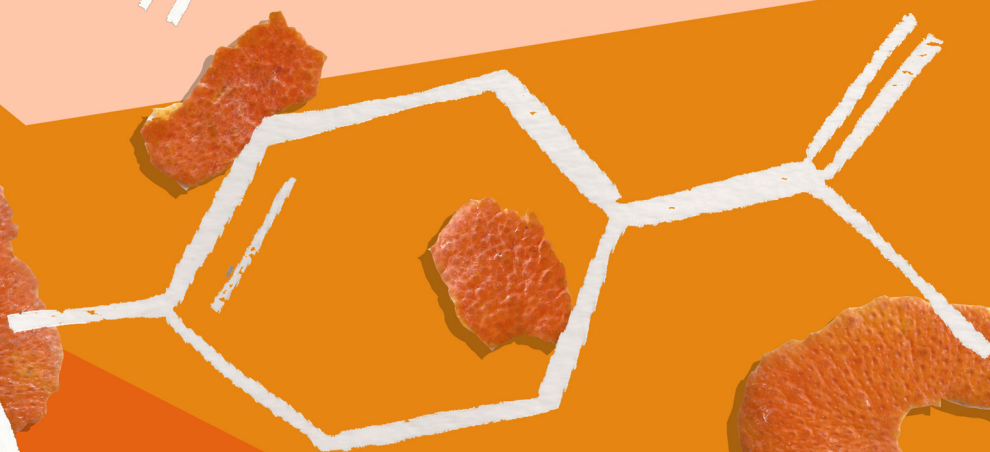




Student - Scholars - Day



April - 11 - 2018

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SSD Committee

Feryal Alayont	Mathematics
Alice Chapman	History
Susan Mendoza	Office of Undergraduate Research and Scholarship
Melissa Morison	Classics
Debbie Morrow	Library
Ross Reynolds	Physics
Michael Scantlebury	Hospitality and Tourism Management
Shelley Sickrey	Office of Undergraduate Research and Scholarship
Jamesha Tiner	Office of Undergraduate Research and Scholarship
Richard Vallery	Physics
Patricia Videtich	Geology

Welcome to Student Scholars Day 2018!

It is with great pleasure that we welcome you to celebrate the diversity and excellence of faculty-student collaboration at GVSU. In its 22nd year, Student Scholars Day continues to grow in scope, including six hundred students and mentors in over four hundred presentations. We are excited to support the achievements of these students representing seventy diverse majors across the university. We encourage you to visit presentations of interest in a variety of disciplines and presentation formats, and to engage these students in meaningful discussions of their work. This event is a true celebration of creative thought and practice.

Many have contributed to make this growing event a success. We are especially grateful for the hard work and patience of Shelley Sickrey, Jamesha Tiner, LeAnne Lazar, Dana Arnold, Natalia Blanco, Lavar Green-Jackson, and Kristin Schepke who made this process manageable and enjoyable. We thank the members of the 2018 SSD committee, Feryal Alayont, Alice Chapman, Melissa Morison, Debbie Morrow, Ross Reynolds, Michael Scantlebury, Richard Vallery, and Patricia Videtich, for their dedication and continuous flow of creative ideas. It takes an entire year to put together a program like this, and we appreciate the hours spent engaging with us in this process.

Once again our deepest gratitude goes to Dan Slaughter for all of his work in the web registration redesign for SSD. We would also like to thank the Event Services staff for their assistance and patience. We would also like to thank Jeff Woollet for assisting in the preparation of Henry Hall.

Thank you to Anthea Mitchell for her artistic contributions to this abstract book. Her submission was one of several pieces submitted in response to a student competition hosted by the Office of Undergraduate Research and Scholarship. Anthea's piece was selected to serve as the cover by the SSD committee.

Thanks to our student, faculty, and staff volunteers for their commitment to the university's mission and values, as evidenced by their involvement in this important activity. We value the time and effort given to this event.

A very special thank you goes to the faculty mentors who work collaboratively with undergraduate and graduate students in their scholarly and creative pursuits. We know it takes a great deal of time and dedication, but these experiences make a formidable impression on the education of GVSU students. We applaud your commitment and passion for teaching and learning.

And finally, a day like this does not happen without outstanding students like this year's SSD presenters. These students have sought ways to connect their classroom experiences with scholarly and creative practice. They have engaged in a process of discovery that is often difficult and demanding. We thank these students for taking full advantage of their liberal education at GVSU. We are proud of their achievements and excited to share their success.

Please enjoy this day of celebration. Attend the many presentations available throughout the day. We extend a special invitation to attend the presentation given by wonderful GVSU faculty. They will discuss *Research That Relates: Talking About Your Research and Why it Matters*. Today is sure to be a day of sharing and celebration.

Susan Mendoza, Ph.D.
Director, Office of Undergraduate Research & Scholarship
Center for Scholarly & Creative Excellence

Schedule of Events

Poster Presentations

Henry Hall Atrium and Kirkhof Center
9:00 a.m. – 5:00 p.m.
See page 16 for detailed schedule.

Oral Presentations

Kirkhof Center
9:00 a.m. – 5:00 p.m.
See page 112 for detailed schedule.

Exhibition of Art (Apr 4-16)

Mary Idema Pew Library Exhibition Space
April 11, 2018
9:00 a.m. – 5:00 p.m.
Artist Reception 4:00 p.m.
See page 137 for detailed schedule.

Panel Presentations

Kirkhof Center 2263
9:00 a.m. - 5:00 p.m.
See page 131 for detailed schedule.

Film and/or Live Performance

Mary Idema Pew Library Main Floor Video Display
10:00 a.m. & 12:00 p.m.
See page 142 for detailed schedule.

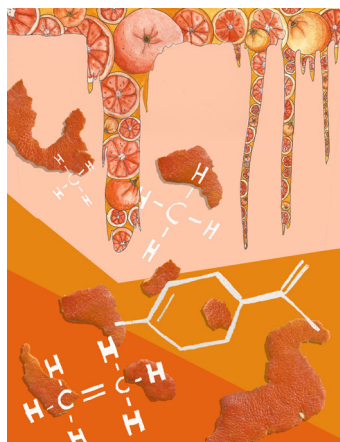
Research That Relates: Talking About Your Research and Why it Matters

Kirkhof Center 2204 (Pere Marquette), Allendale
5:00 p.m. Faculty Panel Presentation

Statement from the Cover Artist

Anthea Mitchell

This piece represents experimentation, transformation, and diffusion of ideas. It is comprised of abstract monotype prints created in printmaking. These one-of-a-kind prints were created by experimenting with thinning ink so it would diffuse once it reached the plate. It took many attempts to get the prints right and there was always a margin of error, like any experiment. As with any idea, the prints were shared and improved upon with each attempt. The black and white prints were then recycled and transformed with color, overlays, and shapes, transitioning from printmaking into digital art.



Faculty Panel Presentation

Kirkhof Center 2204 (Pere Marquette), Allendale Campus

5:00 p.m.

Join us beginning at 4:30 p.m. for hors d'oeuvres and beverages.

Research That Relates: Talking About Your Research and Why it Matters

Discovery, innovation, and creation are ways in which Lakers can change the world, but only when shared with others! Telling your research story effectively (communicating your inspiration, your process, and the significance of your results) is the only way your work can really have an impact. In this session, faculty panelists will discuss how they communicate their research and scholarship with the community at large, and how their work informs business, public policy, local history, and government.

Panelists:

Janet Brashler, Anthropology

Merritt DeLano-Taylor, Biomedical Sciences

Rick Rediske, Annis Water Resources Institute

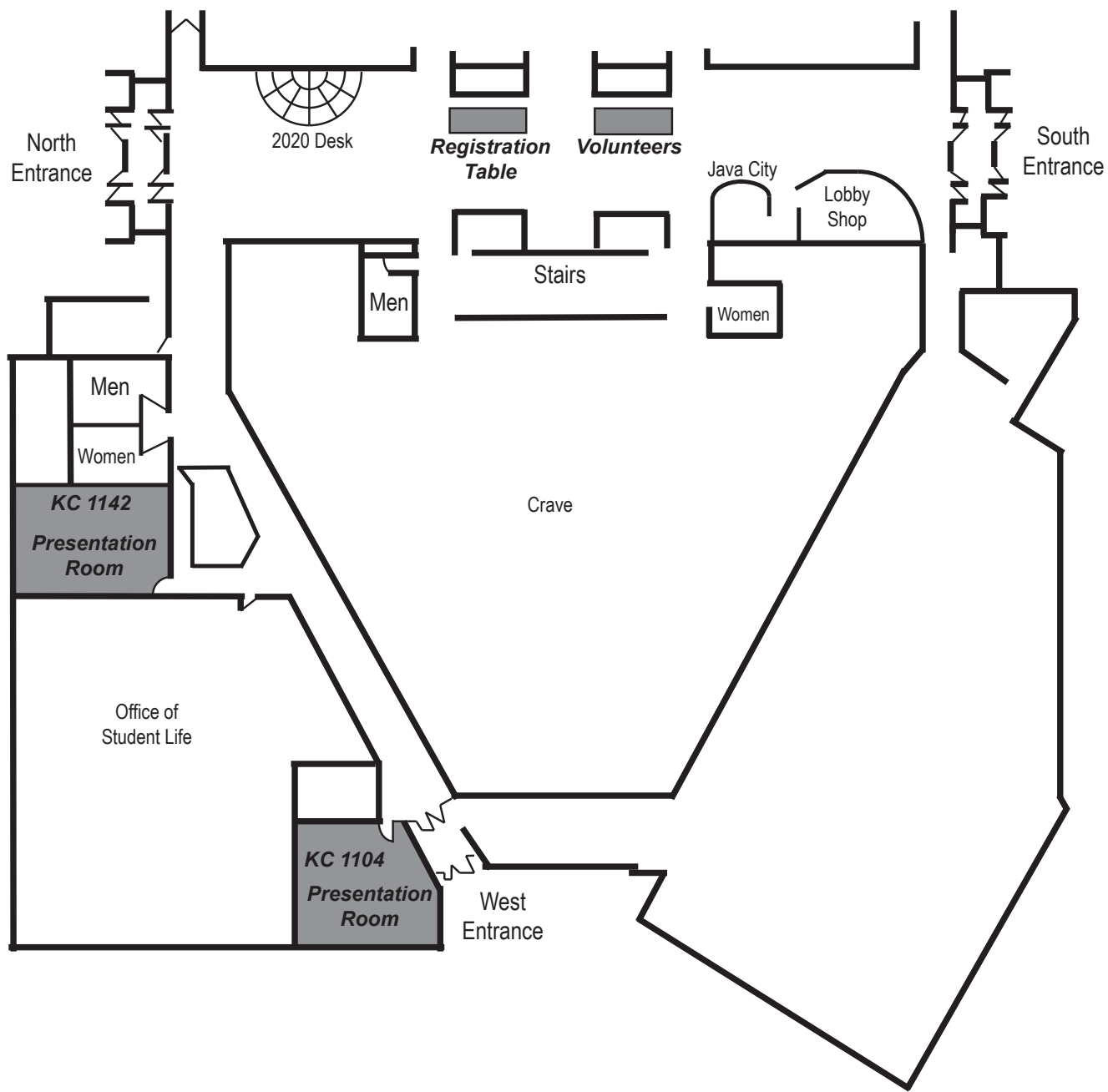
Michael Scantlebury, Hospitality & Tourism Management

Star Swift, Seidman College of Business-Management

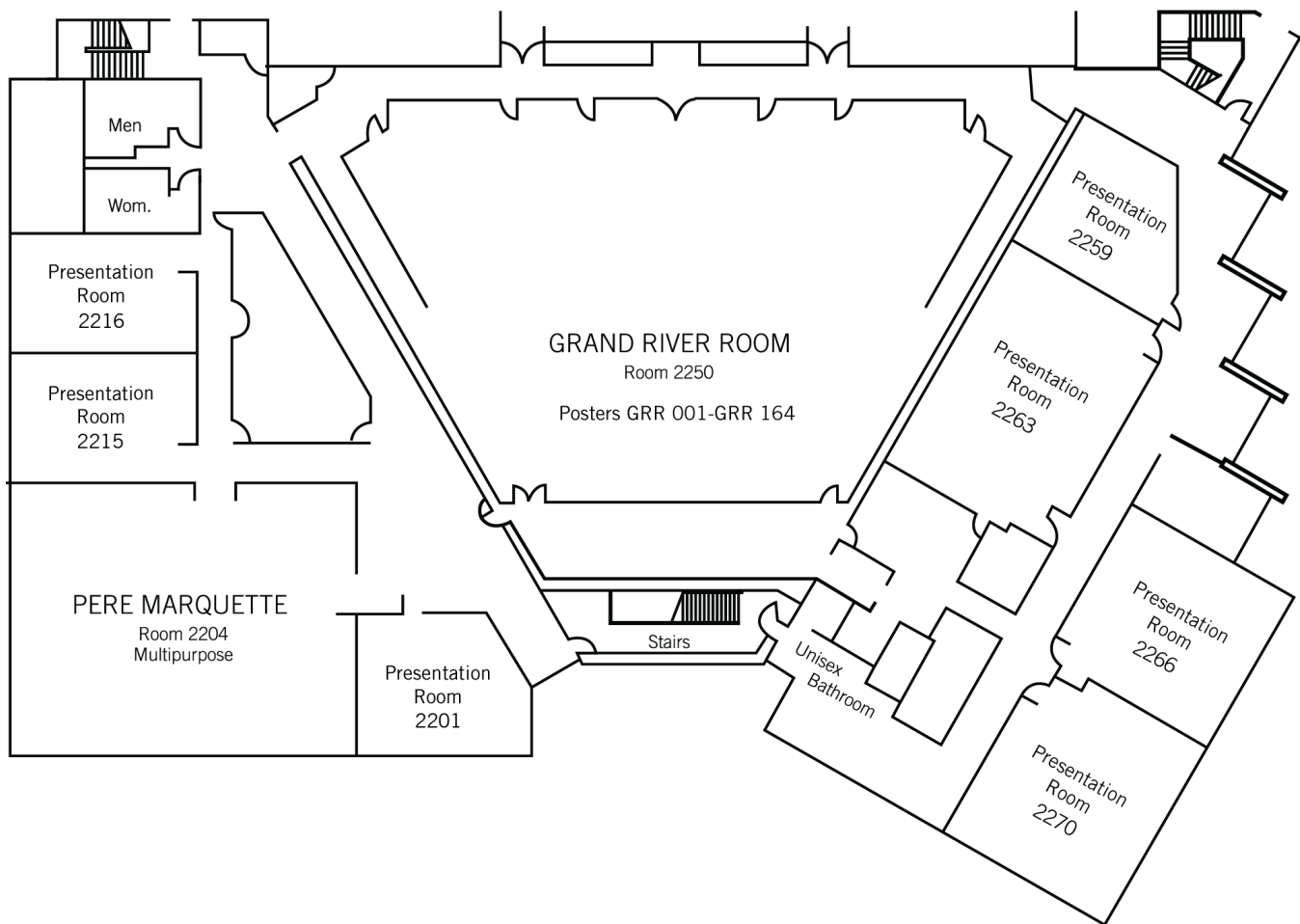
Moderator:

Mark Luttenton, Biology

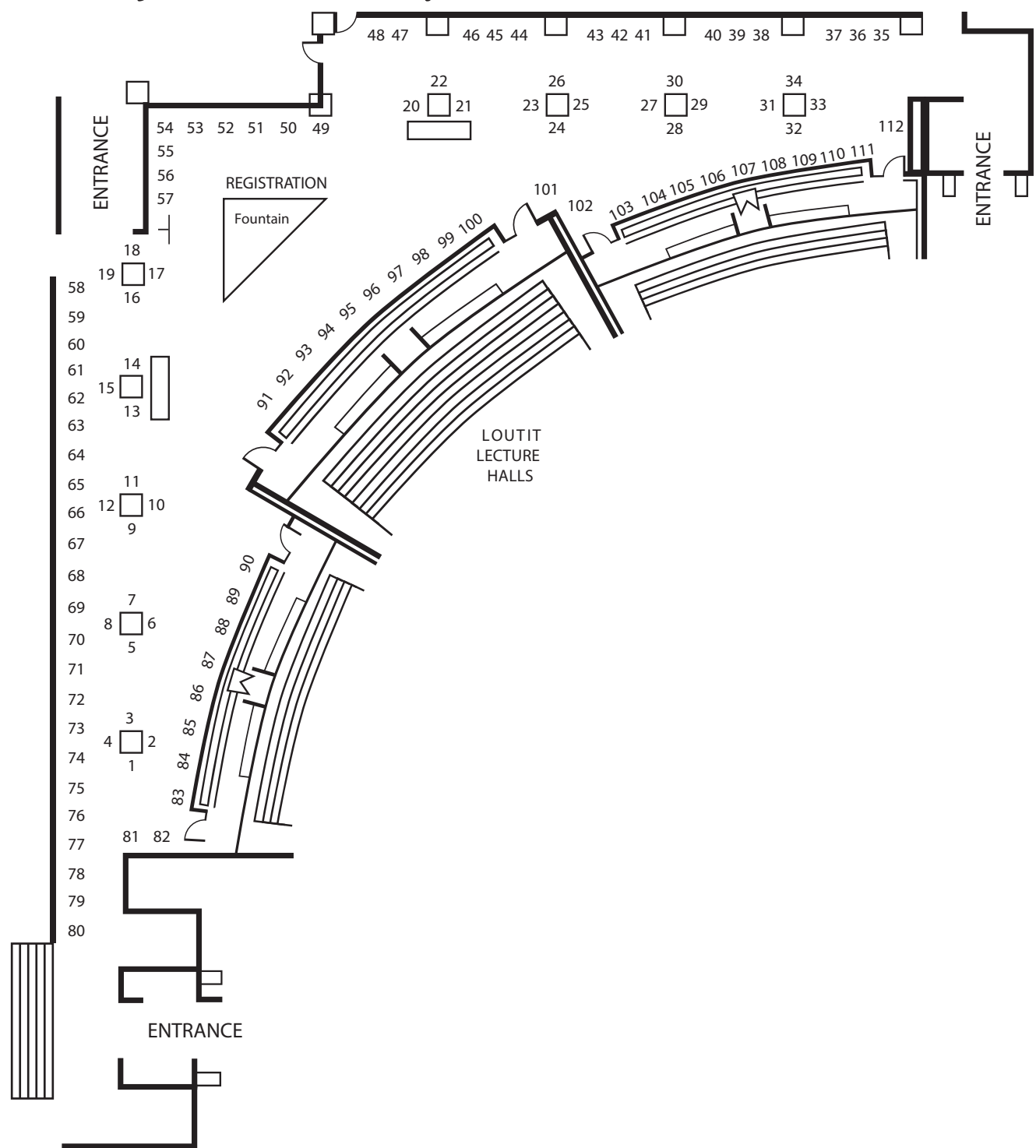
Kirkhof Center First Floor Map



Kirkhof Center Second Floor Map



Henry Hall Map



History of Student Scholars Day

by Neal Rogness and Shelley Sickrey

In the summer of 1995, a small group of faculty members in the Science and Mathematics Division met to explore the feasibility of creating an event where students could present their findings from faculty-mentored research to a university-wide audience. P. Douglas Kindschi, Dean of Science and Mathematics, was enthusiastically supportive, thus Student Research Day (SRD) was born.

It was decided to hold the event on April 12, 1996, in conjunction with the dedication and celebration of the new Seymour and Esther Padnos Hall of Science. The first-time event was expected to draw about thirty student participants. All expectations were exceeded when the registration period ended with over 150 presenters committed to present almost 100 presentations. The first event was a tremendous success; however, it was unknown whether SRD could be a successful “stand alone” event. These fears were quickly allayed when the second annual Student Research Day was held in April of 1997 and proved to be a great success with a similar level of participation. The event became popular enough to get requests from students outside of science and mathematics majors who wanted to present their work. An effort began to make the event truly university-wide, which then Provost Glenn Niemeyer whole-heartedly supported.

Students from all majors were encouraged to present and/or exhibit their faculty-mentored scholarly work at the event. To help make the event more inclusive, its name was changed from Student Research Day to Student Scholarship Day. The first university-wide event doubled in size with nearly 300 students giving almost 200 presentations in 1998. The first SSD keynote speaker was Dr. Robert Powell, Professor of Biology at Avila College, who talked about “Student/Faculty Collaboration: Teaching and Scholarship.” Another name change occurred in the Fall of 2009, this time to Student Scholars Day. The name change was instituted to combat occasional confusion over the nature of the event. “It’s still very focused on student work, but the new name takes away any ambiguity about what the purpose of the day is,” said Susan Mendoza, Director of the Office of Undergraduate Research and Scholarship.

What began as an event primarily composed of science and mathematics majors has grown to include student presentations representing majors from across the university. The GVSU community has truly embraced this annual event as a day in which to take pause and proudly celebrate the scholarly achievements of students from the past year. Student Scholars Day continues to grow, both in size and scope. The event continues to encompass interdisciplinary relationships among the presentations. Individually, the presentation is clear and focused. Taken as a whole, a larger, more inclusive picture of collaboration and learning emerges.



Highlights of OURS Programs

Beckman Scholars Program at GVSU

Funded by the Arnold and Mabel Beckman Foundation

The summer of 2017 saw GVSU's first cohort of Beckman Scholars. GVSU is one of eleven institutions nationwide selected to receive the 2017 Beckman Scholars Program award.

The purpose of the Beckman Scholars Program (BSP) is to provide an in-depth, sustained undergraduate research experience for exceptionally talented, full-time undergraduate students at US colleges and universities. The BSP provides funding and support for a student and mentor to conduct sustained research over two consecutive summers and one academic year of research.

The Beckman Scholars Program (BSP) at Grand Valley State University (GVSU) is designed to support and develop exceptional undergraduate research students in either chemistry, biology, biochemistry, cell and molecular biology, or biomedical sciences. Success in the sciences requires a honed research skill-set, exceptional academic performance, and the mindset of a research scientist. BSP at GVSU prepares undergraduate students for graduate study and research through each aspect of the program from application to completion. The program offers three components to develop and support Beckman Scholars: 1) a rigorous research apprenticeship, 2) an interdisciplinary mentoring team, and 3) exposure to diverse narratives of success.

The 2017 Beckman Scholars, both of whom are presenting at this year's SSD, are Kimberly Bottenberg and Faith Ureel. *More information about the program can be found at www.gvsu.edu/ours*

TRiO Ronald E. McNair Scholars

Post-Baccalaureate Achievement Program

The McNair Scholars Program is designed to prepare highly talented undergraduates to pursue doctoral degrees and to increase the number of individuals (from target groups) on college and university faculties.

The McNair Scholars are highly talented undergraduate students whose parents have no 4-year college degree and are low-income, or groups underrepresented at the graduate level for doctoral studies. The program accepts students from all disciplines.

The McNair Scholars receive academic counseling, advising, and GRE preparation. In addition, they are matched with a Ph.D. faculty mentor to conduct research and attend a McNair research conference to present their findings. In the first semester of their senior year, the scholars receive assistance with the graduate school application process.

McNair Scholars is a TRiO program funded through the United States Department of Education and Grand Valley State University.

The 2017 McNair Scholars, many of whom are presenting at this year's SSD, include:

Carly Anderson, Maria Hamming, Adrian Hernandez, Haley Hulan, Ryan Lietzau, Liyah Marshall, Christian Miller, Mitchell Mockerman, Vauwn Nghiem-Olson, Miranda Owen, Darwin Perry, Keegan Richards, Amber Sackett, Facundo Santome, and Kristin Schepke.

Highlights of OURS Programs (cont.) Student Summer Scholars (S3) and Modified Student Summer Scholars (MS3)

The Student Summer Scholars (S3) program and Modified Student Summer Scholars (MS3) program provides funds for a student and faculty mentor to devote time to a research and/or creative project during the spring/summer semester. Generally, S3 and MS3 grants provide a student stipend, faculty stipend, and a small budget for supplies.

The Student Summer Scholars (S3) program provides funds for a student and faculty mentor to devote about twelve weeks/400 hours to a research and/or creative project during the spring/summer semester. The Modified Student Summer Scholars (MS3) program is geared toward lower division students and first year transfer students. It provides funds for a student and faculty mentor to devote either about 200 hours over twelve weeks, or 200 hours during the Spring or Summer six week session to a research and/or creative project.

Through these grants and the mentorship of a faculty member, the S3/MS3 program offers a unique opportunity for undergraduate students to do hands-on, professional research and creative practice in their chosen field. Combining academics, field work, and a reflection component provides students with a meaningful learning experience that helps to prepare them for graduate school and future careers.

For each S3/MS3 participant, the project begins with an innovative and thoroughly researched proposal. With guidance from faculty mentors, students identify a research question or an area of creative practice and shape the structure of their project. The value of mentorship is an important part of S3. Experienced faculty mentors act as support and sounding boards for their students.

By building on a foundation of academic and critical thinking skills provided by undergraduate courses, self-motivated students can use S3/MS3 to further their knowledge in a specific area while learning to incorporate academics with professional work. S3/MS3 provides students with a new lens through which to view their long-term educational, work, and life plans.

The 2017 Student Summer Scholars presenting at this year's SSD include:

Ellen Audia, Brian Basinski, Morgan Carpenter, Jessica Crawford, Elizabeth Croff, Christiana D'Annibale, Morgan Doherty, Claire Efting, Francesca Golus, Megan Goy, Ashleigh Harrah, Victoria Irwin, Lauren King, Casey Koch-LaRue, Andrew LaDuca, Halle Nienhaus, Grace Peterson, Uyen Pham, Sarah Robertson, Cole Robinson, Morgan Sundblad, Emily Uhl, Zachariah Vander Tuin, and Tyler Wheeler.

More information about the program can be found at www.gvsu.edu/ours/s3



Highlights of Student Work

Student Scholars Day Abstract Book Cover

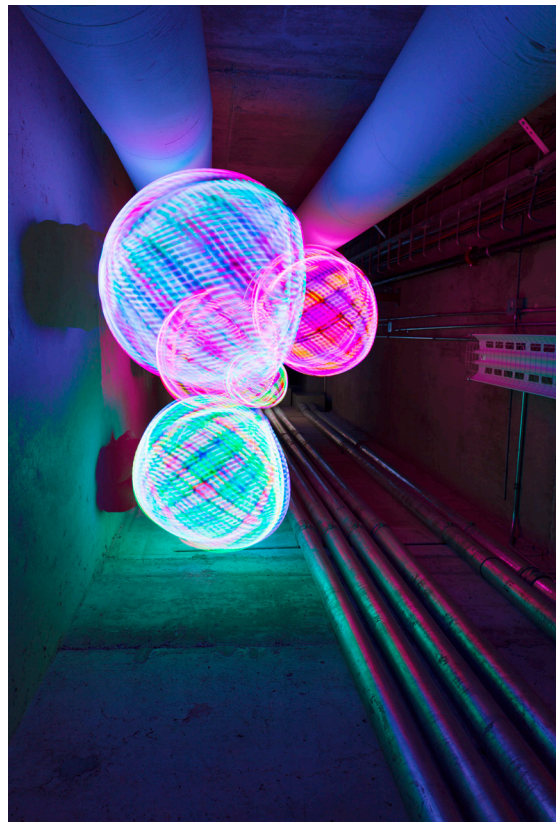
Each year, the Office of Undergraduate Research and Scholarship hosts a competition for artwork to be featured on the Student Scholars Day abstract book cover. All GVSU students are eligible to participate in the competition.

We always receive beautiful work, making it a tough job for the committee to choose just one. Here are just some of the wonderful submissions we received this year.

Rachel Britton, FUSE 1



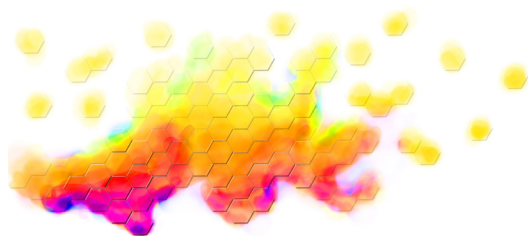
Rachel Britton, FUSE 2



Robyn Knoper, Pressed



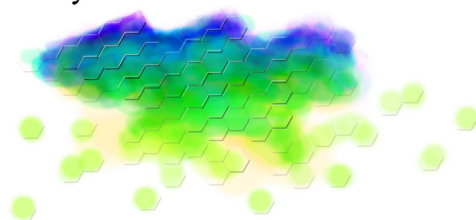
Sydney Shavalier, Untitled



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april eleventh two thousand eighteen

fishladder
A Student Journal of Art and Writing

SPRING 2003

fishladder
A Student Journal of Art and Writing

SPRING 2004

fishladder
A Student Journal of Art and Writing

SPRING 2005

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A Student Journal of Art and Writing

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A Student Journal of Art and Writing

SPRING 2014

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A Student Journal of Art and Writing

SPRING 2015

fishladder
A Student Journal of Art and Writing

SPRING 2016

fishladder
A Student Journal of Art and Writing

SPRING 2017

Spring 2018
fishladder
fifteenth anniversary edition

Come celebrate the fifteenth anniversary of
Grand Valley's student journal of art and writing
at the unveiling party!

Free copies of the journal will be available.

Friday, April 13
6-8 p.m.
164 Lake Ontario Hall

History of Undergraduate Research and Scholarship at GVSU

The pursuit of student research and scholarship at Grand Valley has deep roots in the history of the university. Original student research began in a number of the original Colleges at GVSU, namely Thomas Jefferson College, William James College, and the College of Arts and Science. This tradition continued through decades as the university grew.

Student Scholars Day (SSD) and Student Summer Scholars (S3), originally established in the Division of Math and Science, have served as the anchors for undergraduate research for almost twenty years. These programs have served thousands of students by encouraging original research and scholarship.

SSD and S3 moved to the Brooks College of Interdisciplinary Studies and became part of the Office of Integrative Learning in 2006. During this time, both programs were expanded to support student research from all disciplines and majors.

In 2010, the Office of Undergraduate Research and Scholarship (OURS) was established as part of the Center for Scholarly and Creative Excellence. The mission and intent of the office is to establish comprehensive services and programs which support students in their pursuit of inquiry, creativity, scholarship, and research. In addition to Student Scholars Day, the programs of OURS include:

Signature Programs

Academic Conference Fund (ACF)
Academic and Professional Enrichment Fund (APEF)
Alayont Undergraduate Research Fellowship in Mathematics
Beckman Scholars Program at Grand Valley State University (BSP at GVSU)
P. Douglas Kindschi Undergraduate Research Fellowship in the Sciences
REACH Scholars Program
Student Summer Scholars (S3)

Additional Programs

GVSU Library Scholars Summer Program
GVSU Undergraduate Research Scholar Transcript Designation
Michigan Space Grant Consortium (MSGC)
OURS Project Supplies Grant
OURS Ambassadors
Supplementary Start-up Funds for Faculty
Sustainable Agriculture Place-Based Project Grants
Undergraduate Research Assistants Program (URA)
Undergraduate Research Fair

Poster Presentations, Abstracts & Schedule

HENRY HALL ATRIUM 001

“Springers” Do Jerry Springer: Paternity Testing in Jumping Spiders to Assess Mating Frequency

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenter: Emily Hamel

Mentor: Michael Henshaw

Each sex invests differently in gametes, affecting their reproductive strategy. Males often mate multiply, because sperm are cheap and abundant. Females often are more selective of mates, because eggs are costly to produce. *Phidippus audax* is a jumping spider found throughout North America. Females are selective, and males perform elaborate courtship dances. *P. johnsoni*, a related species, are receptive to multiply mating in a laboratory setting, but lab settings differ from a natural environment. Females may have no choice of males, and males may be presented in succession. Studies of naturally-mated birds have revealed their true mating strategies. This led us to perform the first genetic testing on *P. audax*. We reconstructed genotypes of naturally-mated mothers and their offspring to determine if one or multiple males contributed. Preliminary data suggests that female *P. audax* mate singly; however, one egg sac suggested multiple fathers *and* multiple mothers. Testing of new microsatellite loci will give more information on the mating strategies of *P. audax*.

HENRY HALL ATRIUM 002

Preparation of Synthetic Analogs of Modafinil

Participants attending 11:00 AM - 12:00 PM

Presenter: Alexandra Williams

Mentor: Randy Winchester

2-[(diphenylmethyl)sulfinyl]acetamide, more commonly known as ($\pm$)-modafinil, is a wake-promoting drug used in the treatment of narcolepsy and other sleep related disorders. Modafinil is a chiral compound with a single stereocenter on its sulfur atom. The mechanism of action for Modafinil is not known, but the drug demonstrates a potential for treating a wide range of mental and physical conditions. We are investigating analogues of Modafinil in which silicon has replaced the sulfur, with the desire to have fewer side effects. We will present our progress on the synthesis of these compounds.

HENRY HALL ATRIUM 003

AIM2 (Absent in Melanoma 2) Gene as Diagnostic Biomarker for Typhoid Fever

Participants attending 3:00 PM - 4:00 PM

Presenter: Sarah Robertson

Mentor: Sok Kean Khoo

Typhoid fever (TF) is an infectious disease caused by *Salmonella typhi* (*S. typhi*), transmitted via contaminated water. Early treatment of TF involves a broad-spectrum antibiotic causing antibiotic resistant strains of *S. typhi* due to inappropriate treatment. Therefore, it is necessary to identify accurate diagnostic biomarkers of TF. Quantitative real time PCR was used to investigate gene expression of Absent in Melanoma 2 (*AIM2*), an inflammatory gene, which triggers an innate immune response to infectious microbes. *AIM2* expression in healthy controls (HC)

was compared to TF patients, and other bacteremia patients. *AIM2* was significantly up-regulated in TF patients compared to HC (p-value=0.0002) while there was no significant difference between TF and other bacteremia patients. In summary, *AIM2* can serve as a potential diagnostic biomarker to differentiate TF from HC. Further work is warranted to identify biomarker candidates to differentiate TF and other bacter

HENRY HALL ATRIUM 004

Latinos and the Michigan Auto Industry

Participants attending 1:00 PM - 2:00 PM, 3:00 PM - 4:00 PM

Presenter: Katlyn Johns

Mentor: Nora Salas

The automobile industry has played a very important role in Michigan. However, it also can have negative effects if jobs are cut. Layoffs affect many employees, often thousands at a time. Looking at the assembly plants for Ford Motor, Daimler-Chrysler, and General Motors in the state of Michigan, this study finds whether layoffs and other events in the auto industry affect the Latino population in the state of Michigan. The hypothesis for this study is the Latino population will decrease with layoffs and plant closings. Other major events in the area will be considered as well since there are many variables affecting population changes. Census data for the Latino population and information on events occurring in Michigan are used to approximate when and why Latinos would be leaving or arriving. Using only the cities in Michigan that have assembly plants, it appears there is a weak correlation between shifts in Latino population and changes in employment within the auto industry.

HENRY HALL ATRIUM 005

Effects of Self-Selected Music on Performance and Mood

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 3:00 PM - 4:00 PM

Presenters: Carly Beyer, Sydney Gregart, Sarah Jawara, William Page

Mentor: Amy Gyorkos

Music acts as a stimulus to improve performance by creating subject dissociation due to external focus. Listening to music has been shown to have a positive effect on subjects' perceived exertion and mood, thus increasing performance. The purpose of this study is to investigate the effects of self-selected music on performance and mood. Subjects will be randomly assigned to no music, most preferred music, or least preferred music. Subject performs leg press for 3 sets at 75% of 1-RM to fatigue, with 2 minutes of rest between sets. Subjects perceived exertion (RPE), performance, and mood will be recorded. Mood will be recorded using mood states questionnaire. We hypothesize that music will improve performance and mood with associated lower perceived exertion, regardless of type. Data collection is currently in progress.

HENRY HALL ATRIUM 006

Characterization of a Drug for Alzheimer's in the Retina Using a Confocal Microscope: Applications to Glaucoma

Participants attending 10:00 AM - 11:00 AM

Presenter: Grace Peterson

Mentor: David Linn

Past research and recent S³ projects have demonstrated that with increasing concentrations of DMP 543 (a potassium channel blocker in neuronal cells) in vitro, retinal neurons release increasing levels of acetylcholine

(ACh), and there is higher cell survival over time indicating a possible neuroprotective effect. Therefore, DMP 543 has potential as part of a combination therapy for glaucoma to enhance release of 'protective' ACh. A confocal microscope imaging protocol was developed to examine intact retinal slices treated with an intracellular calcium indicator and increasing DMP 543 to demonstrate the cells activated by the compound. The activity of cells could be measured by comparing the fluorescence intensity produced by various cells in the slice. It was found that the amacrine cells releasing ACh were first to demonstrate a significant increase in activity, followed by a significant increase of higher magnitude in the activity of the retinal ganglion cells.

HENRY HALL ATRIUM 007

Curcumin's Effect on Ulcerative Colitis and Its Mechanism of Action

Participants attending 3:00 PM - 4:00 PM

Presenter: Yousif Slim

Mentor: John Capodilupo

Ulcerative Colitis (UC) is one of the two major types of inflammatory bowel syndromes, the other being Crohn's disease. UC creates ulcers within the large intestines and can be aggravated from extrinsic factors, such as stress and food. The underlying cause of UC may either be due to immune system malfunction or genetics. Research has sought different types of natural remedies. Curcumin, a yellow pigment derived from the rhizomes of *Curcuma longa*, has been shown to produce anti-inflammatory effects in patients with UC, due to its high reactivity with the protein complex, NF-kB. This complex controls cytokine production which is responsible for inflammatory response via the interleukin-1 family. I conducted a meta-analysis to inform those with UC of curcumin's therapeutic benefits through the use of databases. This research concludes that curcumin sufficiently causes an anti-inflammatory response in patients with UC by supplementing curcumin with prescription medication.

HENRY HALL ATRIUM 008

The Inside History of the Biomedical Sciences at GVSU

Participants attending 10:00 AM - 11:00 AM, 2:00 PM - 3:00 PM, 4:00 PM - 5:00 PM

Presenters: Alexandra Heine, Haleigh Hunter, Haley Wanic, Rachael Weber

Mentor: Sheldon Kopperl

The Biomedical Sciences (BMS) department at Grand Valley State University (GVSU) has a rich and colorful history. Over the past four years, the history of this department has been probed and explored by Dr. Sheldon Kopperl and his group of student research assistants. Through the use of archival research, BMS faculty and staff interviews, and surveys, the evolution of the BMS department from a small cohort in 1972 as the School of Health Sciences (SHS) to the ever-expanding body that it is today was revealed. Due to the addition of the invaluable insight and knowledge of Dr. Kopperl, the collected history of the BMS department was infused with personal memories, allowing a written history of the BMS department to be created.

HENRY HALL ATRIUM 009

A Literature Review of Fall Light Research in Correlation with Inpatient Falls

Participants attending 9:00 AM - 10:00 AM

Presenter: Nicole Gustin

Mentor: Grace Huizinga

The majority of falls within a hospital result in no injuries, but a fall can greatly increase a hospital's operational

costs. In 2013 the Joint Commission reported that a fall could result in a \$13,000 dollar operational cost increase and add at least six days onto the patient's hospital stay. Not much research has been completed that relates call light response time to number of inpatient falls. My poster reviews four studies completed in Michigan hospitals, that look at the correlation between call light response time and number of inpatient falls. I also reviewed a few of the fall prevention programs hospitals currently utilize and reviewed their efficacy in reducing the number of inpatient falls.

HENRY HALL ATRIUM 010

Maasai and Native Americans

Participants attending 4:00 PM - 5:00 PM

Presenter: Dana Spielberger

Mentor: Lisa Kasmer

Scattered throughout the Great Rift Valley in Eastern Africa are the villages of an ancient civilization. Standing tall and wrapped in red, the landscape is dotted with the outline of these proud, noble, and brave people. These are the Maasai. The Maasai are a semi-nomadic tribe of warriors that account for one of the roughly 3,000 tribes living in Africa. They adhere to a simpler and more primitive way of life. However, their lifestyle is not as far removed as one might expect. Despite a nearly 9,000 mile gap, there is another, more familiar, tribe of people who lived a very similar lifestyle to that of the Maasai: the Native Americans. This presentation looks at the similarities and differences between the African Maasai and the Native Americans.

HENRY HALL ATRIUM 011

Comparison of Maxillary and Mandibular Dental Topographical Features in the Balta, Peru Mammalian Community

Participants attending 9:00 AM - 10:00 AM

Presenters: Krystin Bussiere, Mark Hosea

Mentor: Laura Stroik

The Balta, Peru community consists of a variety of mammalian species, including marsupials, rodents, primates, and bats, encompassing a variety of dietary regimes. Dental topography has been shown to be associated with diet in certain mammal groups, but up to this point, previous research has mainly focused on mandibular second molars. This study examined the dental topography of the maxillary second molar in a subset of the Balta community to determine if it points to the same diet as the mandibular second molar. Casts of second molars were microCT-scanned, and dental topographic measures were collected for each pair of molars (N=20 pairs). Using a paired t-test, the results indicated that the dental topographic values of maxillary and mandibular second molars in this sample were not significantly different ($P < 0.05$). This result suggests that both mandibular and maxillary molars may be suitable for dietary reconstruction in the mammalian fossil record.

HENRY HALL ATRIUM 012

Individual Differences in Learning Verbs Through Story Telling in Toddlers

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenters: Jenna Beffel, Stephanie Eslick, Alexis Hansen, Monica Van Til, Elizabeth Walder,

Maureen Wood

Mentor: Josita Maouene-Cavin

Previous literature on embodied cognition suggests that movement and body parts may facilitate verb

comprehension during the critical period of verb acquisition. Yet a causal relationship between verb knowledge and motor development remains relatively unknown. This study sought to determine whether enacting contributes to learning advanced verbs related to leg movement. Our study followed five children ages 26-40 months old over four days in a daycare setting. They were first read a story about a trip to the zoo. The investigators acted out strolling, leaping, marching, and sprinting and the children acted the verbs out with them. After, the children were asked to enact them to test comprehension. The results suggest that although accuracy of enactment increases with age, individual differences in temperament appear to play a greater role. Also, parents' report of temperament was not indicative of the child's temperament at daycare. These findings will guide our next experiment..

HENRY HALL ATRIUM 013

ACEs Trauma Rates in Parents Evaluated for Competency to Parent

Participants attending 10:00 AM - 11:00 AM, 2:00 PM - 3:00 PM

Presenters: Kayla Bates, Rasmus Grydehoj, Alyssa Langenberg, Liyah Marshall, Kristen Miller

Mentors: Gwenden Dueker, Mary Russa

Over the past two decades, research has shown that exposure to trauma (ACEs) can have impact on individuals throughout their lives. ACEs are defined as potentially traumatic events that can have lasting, negative effects on a person's health, social, and emotional well-being (Felitti, 1998). ACEs are divided into two categories: abuse (neglect, emotional, physical, and sexual) and household challenges. Our presentation will assess rates of trauma among parents who have been involved with child protective services due to concerns regarding their Competency to Parent. Specifically, we are interested in the rates at which these parents have experienced individual ACEs traumas, such as loss of a parent, physical abuse, sexual abuse, domestic violence, and substance abuse. We will compare these rates of trauma to those found in state and national samples, and implications will be discussed.

HENRY HALL ATRIUM 014

Expanding the Role of C-N Coupling Reactions: Targeted Synthesis of Novel Antibiotic

Participants attending 10:00 AM - 11:00 AM

Presenter: Morgan Carpenter

Mentor: Matthew Hart

Linezolid, a member of the class of antibiotics called oxazolidinone was developed to target the 50S ribosomal unit exclusive to the bacterium ribosomal complex aiming to leave the human cells unaffected. As a result of fast growing antibiotic resistance there has been a critical need for Linezolid derivatives with increased potency. The goal of this project is to develop novel antibiotics with a greater number of hydrogen bonding sites. The focus has been on expanding the role of the C-N coupling reactions utilizing amide substrates: the Goldberg Coupling. Optimal conditions were established utilizing a catalyst system of copper iodide, trans-1,2-diaminocyclohexane and dimethylformamide under 140°C. A number of substrates were surveyed to establish the scope of the reaction. An unexpected result has led to the possibility of a one pot synthesis of Linezolid derivatives.

HENRY HALL ATRIUM 015

Genetic Connectivity of Eastern Massasauga Rattlesnakes in Michigan

Participants attending 2:00 PM - 3:00 PM

Presenter: Kristin Schepke

Mentor: Jennifer Moore

Investigation of population structuring and gene flow gives insight into negative effects that are associated with habitat fragmentation. Due to factors like habitat destruction, eastern massasauga rattlesnake (EMR) populations are now listed as federally threatened. Previous studies have shown that EMR populations are strongly genetically structured. Here we investigate gene flow and population structure between EMR populations in Michigan. We genotyped individuals from eight sample sites across Michigan, using microsatellites. Data were analyzed and F_{IS} and F_{ST} calculated. A preliminary STRUCTURE analysis produced $K=7$. Preliminary results indicate isolation and limited gene flow of Michigan populations. Despite isolation, most populations do not indicate inbreeding. Island populations are an example of extreme isolation and may indicate the possible trajectory of mainland populations. With our study, we hope to inform management plans and increase EMR population health

HENRY HALL ATRIUM 016

Human Cadaveric Dissection, Plastination, and Literature Review: Lesser Trochanter Detachment and Intertrochanteric Crest Fractures in the Elderly

Participants attending 9:00 AM - 10:00 AM

Presenter: Makayla Rosekrans

Mentor: Timothy Strickler

Purpose: Investigate a hip fracture of unknown etiology and origin through cadaveric dissection.

A human cadaveric dissection and plastination was conducted over the course of three months to investigate an unknown left hip fracture due to a fall from bed. The deceased body belonged to a 79-year-old male. The cadaveric hip dissection was performed over the course of three weeks, beginning in September of 2017. The location and type of hip fracture was to be determined during the dissection. Both an isolated fracture, or detachment, of the lesser trochanter of the femur, and an intertrochanteric crest fracture of the femur were discovered. The plastination process was performed over the following nine weeks, beginning in October of 2017. Following dissection and plastination, a literature review was conducted to investigate the prevalence and etiology of lesser trochanter detachment and intertrochanteric crest fractures of the femur in the elderly population.

HENRY HALL ATRIUM 017

Synthesis of Phosphine Ligand Derivatives for Chelation of Metals

Participants attending 2:00 PM - 3:00 PM, 4:00 PM - 5:00 PM

Presenters: Kyle Korman, Jackson Mort

Mentor: John Bender

Kyle Korman

1,1-Bis(diphenylphosphino)methane (dppm) is used to create several derivatives of phosphine ligands. Our goal is to synthesize phosphine ligand derivatives starting from dppm and interchanging atoms on the chelation site such as O, S, and Se. These phosphorus ligands will be tested on their ability to coordinate to transition metals and lanthanides in waste solutions such as nuclear waste. Our results can be analyzed through NMR spectroscopy for both the synthesization of ligands and their successful coordination.

Jackson Mort

1,1-Bis(diphenylphosphino)methane (dppm) is used to create several derivatives of phosphine ligands. Our goal is to synthesize phosphine ligand derivatives starting from dppm and interchanging atoms on the chelation site such as O, S, and Se. These phosphorus ligands will be tested on their ability to coordinate to transition metals and

lanthanides in waste solutions such as nuclear waste. Our results can be analyzed through NMR spectroscopy for both the synthesization of ligands and their successful coordination.

HENRY HALL ATRIUM 018

Investigation into Consistency of Student Thought about Motion and Force in One Dimension

Participants attending 1:00 PM - 2:00 PM

Presenter: Brandon Aho

Mentor: Bradley Ambrose

Many physics education researchers use a theoretical framework which asserts that students do not simply have robust (mis)conceptions about the physical world. They suggest reasoning in pieces, implying physics students have reasoning elements which are combined correctly or incorrectly based on the situation. This model explains why students can be presented with similar questions and respond inconsistently. For example, a student may say the acceleration of a projectile is downward everywhere except zero at the peak. Our goal is to examine how consistent students' reasonings are, and to look for a spectrum of understanding ranging from reasoning in pieces to fully formed conceptions. The data were collected through written pre- and post-tests containing similar but not identical questions, given during class before and after two midterm exams. Student answers demonstrate specific thought patterns, the prevalence of which sometimes exceeds that of even the correct thought pattern.

HENRY HALL ATRIUM 019

Service-Based Learning in Ottawa County, MI: The Restoration Potential of 50 High School Students

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenters: Madeline Burns, Hana Christoffersen, Lauren Meyers, Mary Parr

Mentor: Todd Aschenbach

Due to immense agricultural industries in Ottawa County, MI, local areas have been impacted by exotic species. Pigeon Creek Park and Riverside Park have been managed in recent years for invasive species removal by Ottawa County Parks and Recreation Commission. As the Hemlock wooly adelgid (HWA) advances north, the expected impact of a new, devastating pest is cause for concern. The GVSU Soil and Water Conservation Society (SWCS) initiated a service-based learning project in collaboration with Ottawa County Parks and Ottawa County Careerline Tech Center (CTC). During two service days, we inspired local youth involvement in the restoration, reclamation, and preservation of natural areas. Students identified and removed invasives, implemented early detection techniques for HWA, and dispersed seed at restoration sites. We foresee the potential for a lasting partnership between Ottawa County Parks, CTC, and SWCS, as Pigeon Creek Park and Riverside Park continue to undergo restoration.

HENRY HALL ATRIUM 020

Hybrid Shrub-Willow Biomass

Participants attending 9:00 AM - 10:00 AM, 2:00 PM - 3:00 PM

Presenter: Andrew Freiburger

Mentor: Dalila Kovacs

Shrub-willows are a rapidly growing native plant that is able to withstand the hardships of the mid-west region.

Using these willows as a raw material for biorefinery was investigated in this project, with the aim of quantitatively determining its potential to produce platform molecules, other high-value products, and ultimately, compounds or mixtures that will displace conventional fossil fuels. The four hybrid shrub-willow species that were specifically analyzed were cultivated at GVSU's Sustainable Agriculture Project, while the wild comparisons were harvested nearby. The shrub-willows were analyzed for water, ash, and extractable content. The extractions were conducted via steam distillation and soxhlet extraction with ethanol, dichloromethane, hexanes, and acetone. GC-MS analysis of the extracts was used to characterize the extractable chemical profile; the most prevalent detected compounds were salicin, c-sitosterol, 2-hydroxy-acetophenone and 1,2-benzenediol.

HENRY HALL ATRIUM 021

Spectroscopic Analysis of DC Glow Discharge

Participants attending 9:00 AM - 10:00 AM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenter: Ross Kunzi

Mentor: Geoffrey Lenters

S.A. Wissel et al. (2013) proposed a plasma temperature measurement technique in an *American Journal of Physics* paper in which the underlying assumption is that the energies of electrons generated in the discharge are thermally distributed. As a result the energy states of the argon ions are populated according to Boltzmann statistics. We investigated this technique on argon plasmas generated in a DC glow discharge. The technique utilizes spectroscopy to measure spectral line intensities and wavelengths generated in the discharge. These measurements are used to construct a Boltzmann plot whose slope estimates the electron temperature. We expect the technique to be successful, yielding electron temperatures aligned with those seen in Wissel's experiments. We plan to extend this technique to electron temperature measurements in microwave-induced plasma discharges in microgaps.

HENRY HALL ATRIUM 022

Sidewalk Aesthetic and Connectivity: GVSU Allendale Campus

Participants attending 1:00 PM - 2:00 PM

Presenters: Claire McClees, Zachary Schley

Mentor: Elena Lioubimtseva

The purpose of this research study is to examine problems associated with desire paths at two locations on GVSU Allendale Campus, and a potential plan of implementation to take action against these desire paths. There are two areas where desire paths can clearly be observed on campus: the north and south ends of the Mary Idema Pew Library. Through original research and analyzation of these paths, a plan was made to install concrete sidewalks that follow their exact same route. This study found that due to such heavy traffic of students, faculty, and staff utilizing the easiest route to their destinations, the addition of sidewalks would both increase connectivity and improve aesthetic values. This study investigates the main advantages and disadvantages of adding sidewalks rather than replacing the paths with sod or applying other defensive strategies.

HENRY HALL ATRIUM 023

Pre-Professional and Physician Assistant Students' Perception of Cultural Communication

Participants attending 10:00 AM - 11:00 AM

Presenters: Jose Fernando Anleu, Jenna Saleh

Mentor: Molly Paulson

The purpose of this research is to identify self-awareness of cultural communication among pre-professional healthcare students and physician assistant students. Clear communication between providers and patients is essential for optimal health outcomes. As the United States becomes more diverse culturally, the need for healthcare professionals to be skilled in communication that is culturally-sensitive will increase. There is evidence in the literature that healthcare professionals are inadequately trained in these essential communication skills. Using a validated survey that assesses perceptions of cultural communication, the investigators will assess areas that need to be addressed through further education.

HENRY HALL ATRIUM 024

Effect of Dynamic Stretching on Muscular Strength Performance

Participants attending 9:00 AM - 10:00 AM

Presenters: Shannon Flaherty, Alicia Geene, Jacob Helms, Luke Kinney, Tori Mattingly

Mentor: Amy Gyorkos

Stretching prior to exercise is a common practice for athletes in various sports and activities. Dynamic stretching actively moves the joint to warm up the targeted muscles and is the preferred warm up to enhance performance. Dynamic stretching has mixed results as to whether it improves muscular strength performance. The purpose of the study is to analyze the effect of acute dynamic stretching prior to upper body and lower body compound exercises. Five subjects were randomly assigned to dynamic or no stretching prior to exercise. All sessions include a standard five minute warm up. The dynamic stretching includes two sets of 10 arm circles and two sets of 10 arm swings for upper body, and two sets of 10 forward kicks and two sets of 10 lateral leg swings for lower body. All subjects perform three warm up sets of 10 repetitions prior to the 3-rep max of bicep curls and leg press. The data is currently being collected.

HENRY HALL ATRIUM 025

Comprehensive Flood Management Systems for Urban Riparian Communities

Participants attending 9:00 AM - 10:00 AM

Presenters: Maxwell Moler, Aaron VanFleteren

Mentor: Elena Lioubimtseva

Global precipitation events around the world are predicted to increase in intensity over the next decade as a consequence of climate change. Our research project focuses on flood management in Grand Rapids, providing a strong example of a modern city with which to test the effects of incorporating a comprehensive flood system. Green infrastructure, current city flood management plans, ecological factors, and landscape design ideologies will all be examined to determine the most effective method of minimizing urban runoff in riparian communities around the world. By applying landscape ecology and development principles, using research methods such as journal review, green infrastructure observation, case studies, field studies, and ArcGIS applications such as network analysis, we will attempt to find the best solution for the modern urban riparian city to mitigate flood damages to both property and life.

HENRY HALL ATRIUM 026

Effects of Acute HIIT Exercise on Working Memory in Healthy College-Aged Individuals

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenters: Brittney Degroat, Caitlin Gulbis, Erica Halick
Mentor: Ross Sherman

Background: Working memory can be characterized as a component of short term memory, associated with immediate processing of material. In previous studies, findings provide results that show exercise improves certain factors in memory, both short term and long term. Purpose: The aim of this study is to determine the effect of acute, high-intensity interval training (HIIT) on working memory. Methods: Healthy, active, GVSU students participated in this study. Working memory was tested using an automated recall program immediately before, immediately after, and 20-minutes following a 20-minute intervention. The intervention was either a HIIT cycle ergometer protocol or a non-stimulating rest period, assigned using a randomized order. Results: Data will be presented at SSD.

HENRY HALL ATRIUM 027

Embeddability of Partial Latin Squares in the Cayley Tables of Dihedral Groups

Participants attending 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenter: Grace McMonagle

Mentor: Lauren Keough

Latin squares are $n \times n$ matrices with n symbols where each symbol appears exactly once in each row and column. Partial latin squares (PLS) are latin squares that have only some entries filled in; the number of filled entries is referred to as the size. Motivated by results of Wanless and Webb, we are examining an extremal question related to the embeddability of PLS in the Cayley tables of dihedral groups. We will present results on the maximum size of PLS such that each PLS of that size can be embedded in the Cayley table of a given dihedral group.

HENRY HALL ATRIUM 028

Effect of Fasted versus Non-Fasted State on Endurance Performance

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 4:00 PM - 5:00 PM

Presenters: Zachary Capulong, Jeffrey Depew, Sylvia Knight, Corey Stankus

Mentor: Amy Gyorkos

Consuming a carbohydrate-based meal before endurance exercise has shown to increase glycogen stores and improve metabolic parameters that aid endurance performance. The purpose of the study is to investigate the effect of consuming a carbohydrate-based meal on metabolic parameters and endurance performance. Subjects will be randomly assigned to a pre-performance meal or a fasted state prior to a peak aerobic test (VO_{2max}). Subjects will be asked to consume a carbohydrate-based meal 1h prior to trial following a 12h fast. The graded VO_{2max} test will increase 2% in grade and 1mph every 2 minutes of test. Blood glucose will be analyzed at baseline and directly following test. Ratings of perceived exertion (RPE), respiratory exchange ratio (RER), and heart rate will be collected every stage of the graded VO_{2max} test. Data are currently under collection and analysis.

HENRY HALL ATRIUM 029

Connexin Expression in Response to Sodium Nitroprusside to Evaluate Nitric Oxide's Potential Effect on Vasculature

Participants attending 9:00 AM - 10:00 AM, 4:00 PM - 5:00 PM

Presenter: Aaron DeWeerd

Mentor: David Kurjiaka

The expression of Cx43 in endothelial cells (EC) is higher in regions of inflammation and cell growth. Atherosclerotic plaques cause the overlying EC to express more Cx43 due to the changes in shear stress. The upregulation of Cx43 in ECs occurs following balloon angioplasty (restenosis). The plaques interrupt flow reducing EC shear forces which contributes to EC damage. Nitric oxide (NO) is a vasodilator released by increases in shear stress. EC NO is involved in vascular regulation including prevention of cell growth. In the present study, we investigated the direct impact of NO on EC expression of Cx43 by treating bEnd3 cells (ECs) with sodium nitroprusside (SNP: a NO donor treated) at 1 μ M for 6 hours. We isolated protein from these cells at 1.5, 3, and 6 hours. We are probing the protein to determine whether Cx43 expression is altered in endothelial cells by NO exposure. We expect Cx43 expression to be decreased by six hours of NO exposure.

HENRY HALL ATRIUM 030

Effects of Palm Oil Agriculture in Indonesia

Participants attending 2:00 PM - 3:00 PM

Presenter: Meredith Pascoe

Mentor: Elena Lioubimtseva

Palm oil production is currently one of the world's most unsustainable agricultural practices. Since 2006, the country of Indonesia has been the leading producer of palm oil and devotes over 300,000 hectares of the nation's land to growing oil palm crops annually. This study analyzed the effects that palm oil agriculture has on Indonesia's natural environment. Through the use of a number of Indonesia raster and vector spatial data files, a global land cover raster, a palm oil concessions shapefile, and tree cover loss and carbon emission attribute data, a series of maps were created in ArcGIS depicting the location of Indonesia's palm oil concessions with respect to rates of tree cover loss and carbon emissions as well as land cover and land use. The results of this study showed that the areas where Indonesia's palm oil concessions are located are also the areas that have experienced major tree cover loss, carbon emission release, and change in land cover and land use.

HENRY HALL ATRIUM 031

Why Proportion of Head to Mirror is Rendered Unrealistically Large in Self-Portraits

Participants attending 9:00 AM - 10:00 AM

Presenters: Joseph Beh, Lyndsie Calhoun, Loukas N. Kondyles, Allison Sederlund

Mentor: Leon Lou

The size of the head in a mirror looks bigger than its optical image (Gombrich, 1960). In fact, the size of an image in the mirror is exactly half the size of its corresponding physical object, regardless of the object-mirror distance. We explored this size illusion further by asking each participant to draw from a fixed distance a self-portrait that includes the mirror frame. A key experimental manipulation was whether the participants were told to include background objects in the drawing. We predict a smaller head size illusion when the background objects are included, because the background objects can serve as pictorial references for mentally sizing the head. The findings from this experiment have implications for understanding artists' visual perceptual expertise in observational drawing.

HENRY HALL ATRIUM 032

Localization and Function of Histamine in the Adult Gut of *Drosophila melanogaster*

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 2:00 PM - 3:00 PM

Presenters: Caroline Poirier, Kelly Tekiela

Mentor: Martin Burg

In the model system *Drosophila melanogaster*, histamine has been linked to discrete functions, ranging from grooming reflexes, vision, and sleep. In vertebrates, studies have also shown that histamine plays a role in regulating acid secretion in the gut, but it is yet to be determined whether histamine serves an analogous role in the gut of *Drosophila* adults. Using immunofluorescence to detect histamine, we found histamine to be located in the adult gut in several distinct locations. To further characterize histamine function in the gut, the GAL4-UAS system has been coupled with immunofluorescent histamine detection to mark specific cell types or regions of the gut that contain histamine. The effect of histamine on the gut pH gradient has also been examined in adult flies and we have found an alteration of the gut pH gradient in the *Hdc*^{JK910} mutant (which is missing histamine), suggesting that histamine plays a role in gut pH regulation.

HENRY HALL ATRIUM 033

Atrazine Effects on Epididymal Function in Rats

Participants attending 3:00 PM - 4:00 PM

Presenter: Kari Bonner

Mentor: Christopher Pearl

It has been reported that semen quality in men has decreased over time and endocrine disruption is a possible cause. Semen quality consists of semen volume, sperm motility, count and morphology. Atrazine, a common herbicide used in agriculture, is suggested to be an endocrine disrupting chemical. The focus of the study was to investigate the effects of atrazine on sperm maturation and its correlation to male fertility. We tested three different doses of atrazine using 5 rats/dosage: control, low dose, high dose. The epididymis is the place of sperm maturation, so we focused on this organ. The cell height, tubule and lumen diameter in epididymal regions were measured to determine the effects of atrazine. Tubule and lumen diameter of the cauda were significantly shorter in both atrazine treated groups. The initial segment cell height was significantly taller in both atrazine groups. These results demonstrate that atrazine adversely affects epididymal morphology and likely sperm quality.

HENRY HALL ATRIUM 034

Lights Out! Game on a Variety of Graphs

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM

Presenters: Robin Hutchings, Shannon Napier, Liah Renaud

Mentor: Darren Parker

Lights Out! was a handheld puzzle made by Tiger Electronics. It comprises of a 5×5 grid of lighted buttons, which are initially either on or off. Each button can be toggled from on to off, and vice versa. Consequently, all adjacent buttons (up, down, left, and right) have their label changed to the opposite of what it was. The goal of the game is to turn all of the buttons off. We can compare the states of the buttons to integers mod 2 which is equivalent to the set $\{0, 1\}$ with 1 representing on and 0 representing off. We can further generalize this to the integers modulo k with $k \geq 2$, where off is still 0 for all integers modulo k . The puzzle can also be generalized to arbitrary graphs. Specifically, we explored the winnable labelings of wheel graphs and multi-partite graphs in the integers mod k , and winnable labelings of directed graphs in integers mod 2. From this exploration, we can determine the situations in which the game can and cannot be won.

HENRY HALL ATRIUM 035

The Effect of Regulating CRF₂ Receptors on Depressive-Like Behavior During Protracted Alcohol Withdrawal

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenter: Liyah Marshall
Mentor: Glenn Valdez

Alcoholism has detrimental effects on the citizens and budget of the United States, taking the lives of thousands and costing us billions annually. Those experiencing withdrawal report unpleasant mood disturbances such as anxiety, depression, and negative affect. These mood disturbances increase the chance of relapse and make the process of long-term recovery more difficult. Based on previous research showing that activation of type 2 corticotropin-releasing factor receptors (CRF₂ receptors) has the ability to alleviate stress-related behaviors during acute withdrawal, the current study proposes studying the effects of the selective CRF₂ receptor agonist urocortin 3 on depressive-like behavior following protracted abstinence from alcohol.

HENRY HALL ATRIUM 036

Effects of Sub 2-hour Marathon Shoes Compared to Track Spikes on the Metabolic Cost of Running

Participants attending 3:00 PM - 4:00 PM
Presenters: Samantha Behl, Katelyn Erickson, Genevieve Gottardo, Jordan Juzwiak, Jacqueline Magusin, Katelyn Simon
Mentor: Kyle Barnes

Footwear mass, cushioning, and bending stiffness each affect the metabolic cost of running. Recently, marathon racing shoes were developed that combine a highly compliant and resilient midsole material with a stiff embedded plate which claims to enhance running economy by 4%. While these shoes were designed for road racing their efficacy for long-distance track racing where spikes are traditionally worn is unknown. The aim of this study was to compare the energetics and biomechanics of running in marathon racing shoes compared to track spikes in elite level runners. 25 high-caliber runners ran 4x 5-min trials at 14, 16, 18 km • h⁻¹ for men or 14, 15, 16 km • h⁻¹ for women in four different racing shoes during two separate sessions. Testing of each shoe was randomized for each subject and each running velocity. We measured running economy and biomechanical stride characteristics the last 2-min of each trial. Data collection is ongoing and results will be presented.

HENRY HALL ATRIUM 037

Evaluating Maternal Perceptions of Power Mobility Training for Children with Severe Neurodevelopmental Conditions through Automatized Text Analysis

Participants attending 1:00 PM - 2:00 PM
Presenter: Sarah Vieta
Mentors: Naomi J. Aldrich, Lisa Kenyon

We evaluated using an automatized text analysis program (LIWC) to examine maternal perceptions of power mobility training for severely disabled children. Mothers' perspectives changed and were related to children's power mobility skills and mastery motivation after training. Thus, LIWC may provide an additional, objective assessment for power mobility interventions.

HENRY HALL ATRIUM 038

Visual Cue Learning in Crayfish

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenters: Alta Gillham, Laura Miller

Mentor: Daniel Bergman

Crayfish have relatively simple and well-studied nervous systems, yet there has been limited insight into the complex learning processes they use to interact with their environment. This study uses classical conditioning to analyze the learning capabilities of the crayfish species *Orconectes propinquus*. A visual stimulus, a blue LED light, was paired with a food reward each time the crayfish entered the reward zone. This reward zone was alternated daily to reduce the effects of side preference. Following an isolation period used to mitigate the effects of any previously learned behaviors, male *O. propinquus* were trained for a period of six days. On the seventh day, the food reward was no longer provided in combination with the conditioned stimulus and the amount of time spent near the visual stimulus was then quantified. The presence of a statistically significant difference between controls and trained crayfish would demonstrate that *O. propinquus* are capable of visual cue learning.

HENRY HALL ATRIUM 039

Impact of Recommended Drinking Volume Vs. Drinking to Thirst on Endurance Performance

Participants attending 11:00 AM - 12:00 PM

Presenters: Cody Curry, Albert Webster V

Mentor: Ross Sherman

The purpose of this study is to see if different methods of hydration affect performance. Participants used the Monark stationary cycle for at least 30 minutes. Participants consisted of 6 moderately active college students. Subjects were in a room with an elevated temperature to observe the full effects of ad libitum hydration, or following hydration recommendations. Both the recommendations group and ad libitum group had the option to choose their intensity upon the final 5 minutes of exercise to observe differences in their rating of perceived exertion. The following were measured before and after exercise: hematocrit levels and specific gravity in urine.

HENRY HALL ATRIUM 040

Influence of Phosphomimetic Nato3 on Dopamine Neuron Gene Expression

Participants attending 1:00 PM - 2:00 PM

Presenter: Melina Frantzeskakis

Mentor: Merritt DeLano-Taylor

Midbrain dopamine neurons (mDA) can arise from the floor plate of the midbrain and are responsible for the symptoms of Parkinson's disease when they cease to function. mDA neurogenesis and maturation are regulated by multiple genes such as Shh and Foxa2. One gene involved is the basic helix-loop-helix transcription factor Nato3. Its mechanism of action is not well understood, and has restricted ability to form mDA. To better understand the mechanism of Nato3, specific amino acids were altered to mimic the charge at putative phosphorylation sites, creating variants of phosphomimetic Nato3 (PM Nato3). We hypothesized that PM Nato3 had the ability to upregulate the dopamine neuron marker expression in vivo and in vitro more effectively than wildtype Nato3. PM Nato3 upregulation of these genes suggests that the phosphorylation status of Nato3 can influence the expression of genes known to drive dopamine neurogenesis.

HENRY HALL ATRIUM 041

Block-Scale Studying of Grand Rapids Neighborhoods

Participants attending 9:00 AM - 10:00 AM

Presenter: James Kilborn

Mentor: Jeroen Wagendorp

This poster focuses on small-scale planning, identifying factors such as building density, tree canopy cover, and opportunities for green infrastructure implementation. Although the term “neighborhood” is ambiguous, the poster examines three neighborhoods from Grand Rapids and focuses on features unique to each one, such as proximity to commercial corridors, local schools, location to bus lines, building age and density, etc. Examining these factors helps better illustrate the challenges and opportunities each neighborhood has and emphasizes the value in small-scale neighborhood planning.

HENRY HALL ATRIUM 042

Effectiveness of Pre-Workout to Increase Muscular Endurance: Bench Press and Leg Press

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM

Presenters: Grayson Barbot, Kali Hartt, Hailey Smith

Mentor: Ross Sherman

Previous research suggests that the intake of pre-workout supplementation containing caffeine can increase muscular endurance performance. The purpose of this study is to determine the magnitude of increase in repetitions completed for individuals after they have taken pre-workout versus a placebo, flavored water. Participants were tested in the lab on three separate occasions over the span of three weeks. During the first visit, the participants were tested for their 1-repetition maximum (1-RM) to establish a baseline. The following two visits consisted of participants completing as many reps as possible at 70% of their 1-RM on bench press and leg press. For visits two and three, the participant had consumed either pre-workout supplementation or flavored water. Participants also reported their perceived energy level prior to exercise. Data will be presented at SSD.

HENRY HALL ATRIUM 043

A Literature Review on the Effects of the Opioid Epidemic on Pain Management in Vulnerable Populations

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM

Presenter: Nicole Gustin

Mentor: Meridell Gracias

Despite all the recent healthcare advances, older adults continually live in pain that is made tolerable through their opioid prescriptions, yet still undertreated. The current opioid epidemic has these vulnerable patients who suffer from chronic pain fearful that their pain will now be severely undertreated. This poster is meant to serve as a literature review of articles that address the effects the current opioid epidemic has on vulnerable populations such as the elderly.

HENRY HALL ATRIUM 044

Carbohydrate and Fat Metabolism in Moderate Intensity Aerobic Exercise: Fasted versus Fed State

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM

Presenters: Filip Jevtovic, Jared Knapp, John Perez, Sebastian Vanderest

Mentor: Ross Sherman

Background: Previous studies suggest fasting before aerobic exercise significantly increases fat oxidation. Purpose: The primary objective was to compare fat and carbohydrate oxidation in fasted and fed states. Methods: The participants were all aerobically fit GVSU students. A preliminary trial was used to measure baseline data including VO_2max via YMCA cycle test. Each participant completed two experimental trials, allocated using a randomized, cross-over design. In one trial, the participants fasted for 16 hours prior to exercise. In the other trial, the subject ate a carbohydrate-rich meal two hours prior to exercise. Both trials required participants to control their exercise and diet for 24 h prior to testing, and exercise for 60 minutes at 60% VO_2max on a friction-braked cycle ergometer. Fat and carbohydrate metabolism were calculated using indirect calorimetry throughout the duration of exercise. Results: Are being collected and will be presented at SSD.

HENRY HALL ATRIUM 045

Effects of Nitrate Supplementation on Oxygen Delivery During Exercise

Participants attending 10:00 AM - 11:00 AM

Presenters: Jacob Ford, Jacob Okarski

Mentor: Ross Sherman

Background: It has been suggested that nitrate supplementation improves not only performance, but also blood flow of oxygen-rich blood to muscles during exercise. Purpose: The aim of this study is to determine if, and to what extent, nitrate supplementation improves oxygen delivery during resistance exercise. Methods: 6 male GVSU students volunteered, and were separated into two groups (nitrate supplementation and nitrate depleted). Resting blood pressure was taken prior to testing. A 1 rep max test was completed to assess strength, then a 3x10 squat and bench press at 70% 1RM were performed while oxygen cost was measured via metabolic cart, during and post exercise for 10 minutes. Strength between groups was also assessed. Results: Data will be presented at SSD.

HENRY HALL ATRIUM 046

“I’m Confident Like Her”: Youth Athletes Review And Design Photographic Self-representations

Participants attending 11:00 AM - 12:00 PM

Presenter: Emma Gerhold

Mentor: Sally Ross

Mediated images of female athletes shape how boys and girls understand female athleticism and impact what they perceive is possible for themselves. Framed in feminist cultural studies, we examined youth athletes’ perceptions of photographic self-representations of US female college athletes. Adolescent athletes with diverse backgrounds participated in focus groups. They shared perceptions about female college athletes’ photos and presented ideas for self-photo shoots. Themes of athletic competence and multiple identities emerged. Most athletes liked and drew from images of competent athletes. They also wished to depict multiple identities only if they did not detract from a sport focus. Findings suggest these adolescents want to be perceived as competent athletes, while also communicating they are more than an athlete. Presenting female athletes as competent can reinforce respectful cultural narratives and encourage young athletes to emphasize competence in their own self-depictions.

HENRY HALL ATRIUM 047

Hispanic English: Perception and Identity Portrayed in American TV

Participants attending 3:00 PM - 4:00 PM

Presenter: Nicole De Windt

Mentor: Kathryn Remlinger

The goal of this research is to examine how American television shows represent identities of Chicano English speakers. My study examines two shows in particular: *George Lopez*, created in 2002, and the recreation of the show *One Day at a Time* created in 2017. Taking into account current research that suggests a positive shift in American perception of Hispanic English speakers, this study compares how the Hispanic grandmother and mother characters in each show represent Hispanic English speakers' identities and what this says about the American perception of that population. Using current language ideology research, I examine the history of how language contact has influenced linguistic features of Hispanic English. I also consider what social and political factors have constructed Hispanic English. This study then incorporates that information into an analysis to see if perceptions of Hispanic English speakers represented in television have shifted over the last fifteen years.

HENRY HALL ATRIUM 048

Analyzing the Role of a Subset of Degraded Proteins in the Ability of *Candida albicans* to Cause Disease

Participants attending 9:00 AM - 10:00 AM

Presenter: Victoria Irwin

Mentor: Derek Thomas

Candida albicans is a common hospital acquired infection contributing to rising mortality rates on a national and global level. The transition of *C. albicans* into its filamentous form is significant because it appears to be essential for causing tissue damage and disease. Previous work suggested there was a subset of proteins facilitating the transition between non-filamentous and the filamentous forms, and that overexpression of these specific proteins prevents filamentation. Here we attempt to identify additional members of protein subsets and further define and analyze their functions.

HENRY HALL ATRIUM 049

Cinesthesia: The Grand Valley Journal of Cinema

Participants attending 4:00 PM - 5:00 PM

Presenters: Sydney Martin, Eric Shalayko

Mentor: Toni Perrine

Cinesthesia: The Grand Valley Journal of Cinema provides undergraduates the opportunity to showcase their academic work in the field of cinema and media studies. In order to propagate such a discourse, *Cinesthesia* accepts submissions from undergraduates engaged in any discipline, provided their work examines film or cinema in some way. Understanding that the cinema, as both an art form and a cultural artifact, is in constant conversation with various cultures and peoples, the editors at *Cinesthesia* encourage submissions that analyze films in their social, historical, and formal elements. Likewise, the editors favor submissions that focus on film theory and its application to criticism, and they call for in-depth examinations of specific films and their traits. In sum, the editors hope that the journal will encourage students on campus and elsewhere to develop their critical minds so that they can interrogate more effectively and more insightfully the world around them.

HENRY HALL ATRIUM 050

Perception, Attitude and Practice of Breastfeeding Among African-American Women in Grand Rapids

Participants attending 9:00 AM - 10:00 AM

Presenter: Aakriti Koirala

Mentors: Kelli Damstra, Julia VanderMolen

The rate of breastfeeding among African-American women in the United States (U.S.) is the lowest compared to White non-Hispanic, Asian, American Indian, and Hispanic women, and African American women also have the highest maternal and child mortality rate (Reeves & Woods-Giscombe, 2014; Spencer, Wambach & Domain, 2014). Exclusive breastfeeding for the first six months post-delivery is considered to improve nutritional needs and immunity, aid in preventing Sudden Infant Death Syndrome (SIDS), asthma, diabetes, and obesity. Additionally, breastfeeding helps the mother stay in good health and reduces the incidence of breast and ovarian cancer (Tuthill & McGrath, 2013; Spencer, Wambach & Domain, 2014; Steurer, 2017). Even though breastfeeding rates among African-American women have increased by 8% from 2000 to 2008, there is a persistent racial disparity pertaining to the breastfeeding practices of African-American women in the U.S. (Spencer, Wambach & Domain, 2014).

HENRY HALL ATRIUM 051

Structure-based Inhibitor Discovery for a Key Clinical Antibiotic Resistance Target

Participants attending 12:00 PM - 1:00 PM

Presenter: Brian Basinski

Mentor: Rachel Powers

Penicillin and other β -lactams are effective treatments for bacterial infections. Due to their misuse and overuse, bacteria have developed antibiotic resistance. Many bacteria express β -lactamase enzymes, such as OXA-24, that destroy β -lactams by hydrolyzing their defining lactam ring. Currently, clinical inhibitors of β -lactamase enzymes contain the same core β -lactam ring as the antibiotics, resulting in increased resistance. Using structure-based drug design we identified JM52 (Ki 94 μ M) as a novel, non- β -lactam inhibitor of OXA-24. Kinetic assays were performed on 19 analogs of JM52; 6 were identified with improved binding affinity. X-ray crystallography was used to determine the 1.8Å resolution structure of OXA-24 in complex with analog JM52H (Ki 52 μ M), important interactions are shown with key residues within the active site. By better understanding the interactions between OXA-24 and novel inhibitors such as JM52, we can begin to address the problem of antibiotic resistance.

HENRY HALL ATRIUM 052

Where are the Women in *Magic: the Gathering*?

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenter: Joshua Thompson

Mentor: Robert Deaner

Magic: the Gathering (hereafter MTG) is a trading card game that has more than 20 million active players. MTG is played both recreationally and competitively, and some players compete for substantial prizes at professional events. Although women comprise roughly 38% of all players, they comprise only 1-5% of professionals. We will conduct an online survey of MTG players to explore why women are underrepresented among professionals. Previous studies suggest that women may be underrepresented because, compared to men, they are less competitive, practice and play less, practice differently, receive less social support, or face discrimination. We will

present our results and discuss potential implications for understanding women's underrepresentation in other achievement areas.

HENRY HALL ATRIUM 053

Beehive Weight Analysis with Machine Learning

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM

Presenter: Allison Bolen

Mentor: Jared Moore

Colony Collapse Disorder (CCD) has led to declines in honeybee populations across the world. One approach to addressing CCD is through large scale data analysis to identify possible symptoms. Hive weight data is gathered by beekeepers, who then have the ability to annotate their data within a web application, labeling rapid changes in weight with an explanation of the cause. Unfortunately, such changes are frequently not annotated as it requires one to search through potentially large time series, identify a change, and choose to annotate it. In this project, we develop an automated model to identify rapid unexplained changes in beehive weight data. The detector is intended to integrate with the data collection process and the web portal, prompting users about specific time points in the data stream that may need annotating. By automatically identifying probable changes, we hope beekeepers will be more likely to annotate their data, thus improving data quality in the future.

HENRY HALL ATRIUM 054

The Reversal of Northern Cities Vowel Shift in West-Central Lower Michigan: BIT, BET and BUT

Participants attending 11:00 AM - 12:00 PM

Presenter: TJ Neuhaus

Mentor: Wil Rankinen

The present study investigates the acoustic properties of the American English BIT, BET and BUT vowels among life-long western Lower Michigan residents to determine if such speech communities are participating in the Northern Cities Vowel Shift (NCVS). For a person fully participating in the shift, the BIT vowel would be pronounced closer to BET, the BET vowel closer to BAT or BUT, and the BUT vowel closer to BOUGHT. The sociolinguistic variables considered include age, sex, and Dutch/non-Dutch heritage among 40+ life-long residents from Michigan's Kent and Ottawa counties. While previous research suggests the NCVS has been dominant in the Midwest since the 1960s, recent research in neighboring areas of Lansing found young female speakers are now leading in the NCVS reversal. Furthermore, preliminary results of the present study exhibit a similar NCVS reversal in western Lower Michigan speech communities.

HENRY HALL ATRIUM 055

Enhancement of Fast Scan Cyclic Voltammetry Detection of Dopamine with Tryptophan

Participants attending 9:00 AM - 10:00 AM

Presenter: Sarah Thompson

Mentor: Eric Ramsson

Fast Scan Cyclic Voltammetry (FSCV) is an analytical tool used to quantify changes in extracellular levels of neurotransmitters. My project increases the sensitivity of FSCV for dopamine (DA) specifically. FSCV uses the redox reaction of DA to dopamine-o-quinone (DQ) in order to measure the concentrations of DA in the brain in real

time. Previous reports show tryptophan (TRP) irreversibly binds to the electrode surface. TRP-modified electrodes provide enhanced sensitivity for DA, and are durable during extended cycling periods. Based on the mechanism of TRP enhanced sensitivity, we hypothesize that this is due to faster kinetics of electron transfer. This hypothesis is further supported by TRP's role in nature as a highly conserved amino acid in oxoreductases responsible for catalytic electron transfer. This is proof of concept for TRP-modified electrodes in vitro, a one-component electrode modification system that increases sensitivity without losing temporal resolution.

HENRY HALL ATRIUM 056

Investigating Public Goods Using *Salmonella enterica* serovar *typhimurium*'s Production of Siderophores

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenters: Hunter Cochrane, Jillian Green, Bryce Kramer

Mentor: Douglas Graham

Evolutionary theory predicts that within a population of individuals cooperating to produce a common resource, a subset of 'cheats' will evolve to benefit from the common resource without contributing to the production of said resource. We set out to engineer a such a system using *Salmonella enterica* serovar *typhimurium* by creating a mutant strain with an *entC* gene deletion. This deletion from the mutant strain's genome is designed to remove their ability to produce siderophores, the common good being monitored. Siderophores are iron sequestering proteins sent out into the environment by *Salmonella* to attach iron molecules and encourage the uptake of extracellular iron. The current goal of this experiment is to generate the *entC* mutant and examine its growth rate when compared to the wild type in varying iron concentrations. The wild type and mutant will then be cultured together and analyzed via a competition assay to determine if the mutation proves advantageous.

HENRY HALL ATRIUM 057

Healthy Hymns Along the Grand: Implementing Church-based Health Interventions in Grand Rapids, Michigan

Participants attending 3:00 PM - 4:00 PM

Presenter: Jessyca Stoecker

Mentor: Timothy Bulson

The rising prominence of medical and health care clinics, facilities, and systems in the Greater Grand Rapids area is notable and, along with national prestige, has led to increased care for many residents. However, there are other, more personal and value-centered ways that health professionals can improve the health of the community, perhaps by partnering with local religious institutions to disseminate health promotion and disease prevention strategies more effectively. This paper aims to combine these two distinct but important aspects of Grand Rapids--religion and health--in ways that would most benefit the city. The history and perceived effects of this intersection will be examined, as will examples of prominent church-based health programs implemented in the past. Recommendations concerning the development and implementation of such a program are also provided, with an emphasis on ensuring sustainability.

HENRY HALL ATRIUM 058

Latino Migrant Workers in Michigan from the Rio Grande Valley

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenter: John Perez

Mentor: Nora Salas

Migrant workers were essential to keeping the agricultural economy stable throughout times of labor shortages such as World War I & II. While farm owners saw migrants as a means of cheap labor, migrant workers saw opportunity. A large portion of migrant workers came from the Rio Grande Valley of Texas that borders neighboring Mexico. In my research I hope to examine and analyze other texts and interviews of former migrant workers from the Rio Grande Valley covering topics such as the history of migrant workers in Michigan, migrant recruitment and hiring, living conditions, wages, and community socialization.

HENRY HALL ATRIUM 059

Social Exclusion and Perceptions of History

Participants attending 11:00 AM - 12:00 PM

Presenter: Vauwn Nghiem-Olson

Mentor: Kristy Dean

The current study aims to unveil how social exclusion influences perception of U.S history. We hypothesized that social exclusion (versus acceptance) would facilitate endorsement of false, positive historical narratives over true, negative historical narratives. Specifically, false and positive historical events undermine truths that often involve marginalized populations. However, false and positive narratives appear less threatening to U.S. culture versus true, negative historical narratives. Utilizing the reliving task paradigm to manipulate the experience of social exclusion, participants completed questionnaires assessing their basic needs, perceptions of history, and beliefs regarding education and historical monuments. We believe political orientation will moderate these effects.

HENRY HALL ATRIUM 060

Beta-methylphenethylamine Induces Vasoconstriction in Porcine Arteries

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenters: Allysen Dubisky, Philipp Osipsov, Alyssa Schutzenhofer

Mentor: Francis Sylvester

Beta-methylphenethylamine (BMPEA; 1-amino-2-phenylpropane) is an isomer of amphetamine and may possess sympathomimetic properties. BMPEA is sometimes included in pre-workout supplements; the potential vasoactivity of BMPEA has not been studied. Our goal was to record the vasoactivity of BMPEA in porcine arteries. Our hypothesis was that BMPEA is an α -adrenergic agonist that induces vasoconstriction at physiological concentrations in isolated arteries. All arteries were tested with potassium chloride (vasoconstrictor, 15-60 mM) as a positive control and sodium nitroprusside (vasodilator, 10^{-6} - 10^{-4} M) as a negative control. The arteries were then treated with increasing concentrations of BMPEA (10^{-7} - 10^{-3} M). BMPEA induced significant constrictions in the arteries at pharmacological, but not physiological, concentrations.

HENRY HALL ATRIUM 061

Academic Attitudes Toward African American English

Participants attending 3:00 PM - 4:00 PM

Presenter: Benjamin Sparks

Mentor: Kathryn Remlinger

Although strides have been made, African American English (AAE) has yet to be fully recognized as a legitimate dialect by the general public. Largely due to centuries of negative political and media representation, a perception persists that AAE is a degenerate, even broken, language and in the worst cases, is used as justification for an underlying prejudicial racial sentiment. But historical linguistics has proven that modern AAE has its roots in the earliest days of the American republic and is an incredibly robust, valid dialect. Still, attitudes that it is inappropriate for formal domains, particularly academia, persist. For many, its very presence within the classroom is anathema. Utilizing the research of leading AAE scholars, and with the Oakland Ebonics debate of 1996 as a starting point, our discussion will chart the changing attitudes toward AAE, specifically its evolving role within educational contexts, and how African-American learner identities continue to be impacted.

HENRY HALL ATRIUM 062

Development of Language Policy in Singapore and its Effects on Singaporean English

Participants attending 3:00 PM - 4:00 PM

Presenter: Zhuoyang Li

Mentor: Kathryn Remlinger

This current paper summarizes many studies on how language policy changed and developed in Singapore after it was independent and also analyzes its effects on Singapore English. Since Singapore is a multiethnic country with four official languages, the status of English has always been discussed. Further, this paper examines how language policy makes an influence on Singaporean English from the aspects of its social status and linguistic features. Singaporean English has been developed into a variety with its own features on grammar and pronunciation. I also list examples collected from various studies on how Singaporean English is distinguished from Standard English. The goal of this paper is to give a systematic demonstration of the development of language policy in Singapore and its effects on the social status and linguistic features of Singaporean English. My hope is through the research on Singaporean English to raise the awareness of the impact of language policy on a country.

HENRY HALL ATRIUM 063

English Language Commercials in the Netherlands

Participants attending 3:00 PM - 4:00 PM

Presenter: Yihua Xu

Mentor: Kathryn Remlinger

The Netherlands has contacted with the English language for several centuries and nowadays English is frequently used in most commercials on Dutch television (Edwards, 2016). However, research suggests that the English used in those commercials was influenced by the Dutch language, so they became a new variety of English--Dutch English (Raedts et al, 2015). This study investigates the use of Dutch English as shown in the English language commercials by exploring its history, development, and structure in the Netherlands. By analyzing these commercials, I intend to demonstrate how the variety of English used is different from "standard" English and to what extent its use shows evidence of a localized variety. All the data were analyzed using micro-linguistic strategies and a socio-linguistic approach (Edwards, 2010). Preliminary findings show the potential evidence of nativized variety in Dutch English language advertising.

HENRY HALL ATRIUM 064

Identity and Performance of Nigerian English

Participants attending 3:00 PM - 4:00 PM

Presenter: Oyekanmi Oyeniya Oyebanji
Mentor: Kathryn Remlinger

Nigerian English, formed as a result of contact between British English and Nigerian indigenous languages, has several dialects based on geographical differences. Although it developed from the Standard British English used by the colonial masters, Awonusi (1994) has identified areas of the influence of Americanism on the language. He maintains that Americanism is an inherent feature of its pronunciation, vocabulary, and syntax. This study explores identity performance and language ideologies of Nigerian English speakers to examine how language attitudes affect the acceptance and use of the variety. This study relies on quantitative and qualitative methods, including corpus and discourse analyses. Preliminary results show that Nigerian English is viewed as a means of social identification and it is entrenched in people's culture and way of life. Hence, positive attitudes towards Nigerian English are constantly increasing especially among younger generations.

HENRY HALL ATRIUM 065

Irish English in James Joyce's *Dubliners*

Participants attending 3:00 PM - 4:00 PM

Presenter: Bing Wang
Mentor: Kathryn Remlinger

Irish English can be traced from two forms of language: one is Celtic, taken to Ireland in the first centuries BCE; the other is English, taken by settlers from Britain who first arrived in Ireland in the late twelfth century (Hickey, 2011). James Joyce was Irish-born and employs Irish English in his *Dubliners*. To understand and interpret *Dubliners* by a sociolinguistic approach, this paper reviews the history and development of Irish English and summarizes linguistic features of Irish English, including syntax, words and idioms, and pronunciation. Furthermore, it examines Irish English used in *Dubliners* and explores Joyce's intentions to employ them in the context of the stories, particularly those having to do with Dubliners' colonial Irish identity.

HENRY HALL ATRIUM 066

Effects of Glucose vs. Caffeine on Exercise Performance

Participants attending 10:00 AM - 11:00 AM, 1:00 PM - 2:00 PM

Presenters: Elizabeth Carlson, Tara Decker, Rachel Keller, Ashley Laframboise
Mentor: Ross Sherman

Background: Pre-workout is a common practice used in the gym to boost energy and results. It has been shown to alter fat metabolism, affect calcium release, improve muscular endurance, and increase resting energy expenditure. Much like pre-workout supplements are beneficial before exercise, research has shown that ingestion of glucose will increase muscle glycogen and therefore will provide more substrate for muscle contraction during exercise. Purpose: To determine which beverage is most beneficial for muscular endurance. Methods: 5 female and 4 male young adults ranging from ages 20-24 who are moderately active (minimum of 2 days a week of 60 minutes exercise bouts) will participate in this controlled blind trial. On 3 separate occasions, they will ingest one of the 3 beverages about 30 minutes before exercise. The subjects will then participate in a bench press exercise at 70% of their 1RM until fatigue over a span of four weeks. Results: data will be presented at SSD.

HENRY HALL ATRIUM 068

Using ArcGIS to Analyze Well Data and Regional Groundwater Flow to Map the Extent of

Groundwater Contamination Near Rockford, Michigan

Participants attending 11:00 AM - 12:00 PM

Presenters: Gavin Balcom, Lauren Chwojnicky, Micaela Fischer

Mentor: Peter Wampler

The Rockford area in Michigan is currently facing the repercussions of the disposal practices of the Wolverine Worldwide Company. The company recently has been under scrutiny due to improperly disposed by-products created during the process of manufacturing some of their merchandise. These by-products contained the chemicals polyfluoroalkyl and perfluoroalkyl, also known as PFA's and PFC's. Research upon PFA's and PFC's have shown these chemicals to have adverse effects on the human body. The full extent of the contamination in the Rockford area is still being discovered through inspection of various local wells and disposal sites. Groundwater flow direction, water quality analysis from wells, and disposal site locations will be used to map and interpret the size of the contamination plume and its movement within the local watershed.

HENRY HALL ATRIUM 069

Historical, Economic, and the Language Policy of South African English

Participants attending 3:00 PM - 4:00 PM

Presenter: Abdulaziz Almosa

Mentor: Kathryn Remlinger

This paper focuses on the history and development of the *Anglicization* language policy in South Africa that sought to replace Dutch with English in the late 1700s. It describes the linguistic features and its use. It discusses the consequences of this language policy on the education system and the population of South Africa. It also sheds light on the political decisions as well as the economic factors that brought English to the South African region. In addition, it shows the major languages that occurred before and after the English colony. Finally, it discusses what occurred after the British colony era, especially the resistance against the language policy of *Afrikanerization* that was issued by the Afrikaners to reduce the influence of English in Black schools and how this led to the bloody uprisings that claimed the lives of many students.

HENRY HALL ATRIUM 070

Uses and Ideologies of English in Japanese Advertisement

Participants attending 3:00 PM - 4:00 PM

Presenter: Yuan Sui

Mentor: Kathryn Remlinger

English is widely used in Japan for advertisements including billboards, shop signs, menus, vending machines and T-shirts, though more often some usages are different from "native" norms. Some researchers argue that in Japan, English plays a role as "decoration" (Hyde, 2002) while other researchers like Inagawa (2015) argue that these "non-native" uses are more efficient communicative devices. She notes that Japanese English undergoes a process of linguistic localization of this global language—English. This study focuses on online visual representations from open access media to investigate uses of Japanese English in advertisements. The goal of the study is to discuss how global English is localized to promote sales in Japan and the ideologies behind these uses of English.

HENRY HALL ATRIUM 071

History, Development, Structure, and Use of Chinglish in the Linguistic Landscape of

Xi'an

Participants attending 3:00 PM - 4:00 PM

Presenter: Yi Shi

Mentor: Kathryn Remlinger

The term “Chinglish” defined by Pinkham (2000) emerges to describe Chinese style of English. However, the term often carries a negative connotation because of negative language transfer. Chinglish is thus viewed as neither English nor Chinese. For this project, I investigate the history, development, structure, and use of Chinglish in the linguistic landscape of Xi'an. That is, how do signs in public spaces use Chinglish? What is Chinglish? What is the linguistic structure of Chinglish? What is the history of Chinglish and how has it emerged over time? This study relies on qualitative analysis of Chinglish found in the linguistic landscape of Xi'an. Preliminary findings show that Chinglish is drawn more of a pidgin English or an interlanguage with interference from the first language (L1), that Chinese speakers of English adopt Chinese linguistic rules and habits during the process of English learning.

HENRY HALL ATRIUM 072

Researching on Linguistic Ideologies of English in Contemporary India: “Hindi is our ground, English is our sky”

Participants attending 3:00 PM - 4:00 PM

Presenter: Danqing Yang

Mentor: Kathryn Remlinger

On the basis of language ideologies theories, this study will look at how English as one of India's official languages influences people's beliefs, education, life habits, career opportunities. Moreover, I will also seek out the linguistic consequences of globalization in contemporary India. Research data will be gathered from published linguistic journals and mediaography such as Youtube, Facebook, films, songs, and advertisements. The results show that English promotes India's economic development, and also causes problems such as unequal educational opportunities, gender discrimination, etc.

HENRY HALL ATRIUM 073

Does Sampling Affect the Loop Dynamics in Several Clinical Mutants of OXA-66 Beta-Lactamase?

Participants attending 10:00 AM - 11:00 AM

Presenter: Joshua Grey

Mentor: Agnieszka Szarecka

Antibiotic resistant bacteria are a leading cause of nosocomial infections. The primary mechanism of resistance against clinically significant β -lactam antibiotics is through the production of β -lactamases. Mutants of OXA-66 β -lactamase isolated from drug-resistant *A. baumannii* strains display alarming potential for carbapenemase activity. Our previous simulations of OXA-66 mutants showed increased carbapenem binding and modulation of loop dynamics in the active site. However, it is not clear if the timescale of our simulations allows sufficient sampling of the loop conformations. Here we present data from medium and long timescale molecular dynamics simulations, and compare all-Ca RMSD, Ca-RMSD for the loops contributing to the active site, and the distinct loop conformations, from 250 nanosecond simulations to those calculated from microsecond-long trajectories. This project will allow us to better determine the simulation endpoint and sample the conformations of the extended loops.

HENRY HALL ATRIUM 074

The Effects of a Patient-centered Communication Disability Educational Intervention on Nursing Students' Knowledge: A Pilot Study

Participants attending 1:00 PM - 2:00 PM

Presenter: Alycia Pipe

Mentor: Lori Houghton-Rahrig PhD RN

In most settings, individuals with communication disabilities face a number of difficulties, and nurses are in a unique position to help. The purpose of this project is to provide education to nursing students about working with this population and to measure the effectiveness of the teaching through paper and pencil testing. Literature was gathered from the CINAHL database using the search terms "communication disability*" or "communication disorder*" and "nursing". Including only articles from academic journals within the past 10 years and other respectable sources, and excluding any duplicative articles, a total of 12 sources were selected. The literature review will be presented to members of the Student Nurses' Association, which consists of 1st to 5th semester nursing students. To determine the effectiveness of the educational intervention, a pre- and post-test will be administered to consenting participants, and results will be evaluated using paired sample *t*-test analysis.

HENRY HALL ATRIUM 075

Influence of Unhealthy Diet on Stress-Induced Acoustic Startle in Mice

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM

Presenter: Andrew Buchheit

Mentor: Elizabeth Flandreau

Much of the population experiences at least one traumatic event within their lifetime, yet the prevalence of post-traumatic stress disorder (PTSD) is only 3.5% among adults according to the USDVA (2017). Because the likelihood that one will develop PTSD following a traumatic event is low, it is likely that there are other factors mediating the body's response to stress. A possible influence could be macronutrient distribution of one's diet. The interaction between diet and stress response is not well understood, but behavioral tests previously done in our lab suggest that high-fat diet (HFD) and high-sucrose diet (HSD) may deleteriously affect behavior. To further investigate this relationship, a series of acoustic startle response (ASR) tests were performed on mice that were fed diets varying in macronutrient content and exposed to social defeat stress. A correlation between abnormal ASR and PTSD has been demonstrated, proving its validity as a measure of PTSD-like behavior.

HENRY HALL ATRIUM 076

Implementing American Sign Language at Grand Valley State University

Participants attending 12:00 PM - 1:00 PM

Presenter: Abigail Elliott

Mentor: Misti Ryefield

At Grand Valley State University, the administration stresses the importance of cultural competency and freedom of choices at the Liberal Arts level. Currently, American Sign Language (ASL) is not considered an official language through General Education and Bachelor of Arts requirements, and can only be used as an emphasis of study through the Allied Health Sciences Department. This assessment-based project will focus on student interest in the program, survey how other universities in Michigan structure their American Sign Language curricula and the cultural aspects of the Deaf community in the Grand Rapids area, while supplementing evidence that shows ASL is

a language. This needs-assessment project is to ultimately serve as a basis to convince officials and administration at Grand Valley State University to identify American Sign Language as a language, and implement a minor, a Bachelor of Arts cognate, and a possible certification that will be recognized by the University.

HENRY HALL ATRIUM 077

Does the Ratio of Offensive to Defensive Rebounds in Women's Basketball Relate to Points Scored/Allowed?

Participants attending 1:00 PM - 2:00 PM

Presenters: Valerie Lentine, Ethan Levack

Mentor: Ross Sherman

Offensive and defensive rebounds have been found to be key performance indicators in women's basketball. Literature states that defensive rebounds prevent the opposition from scoring and offensive rebounds lead to more chances for the offense to score. The purpose of this study is to determine if points scored relates to the ratio of offensive to defensive rebounds. A season of the GVSU women's DII GLIAC collegiate basketball team was analyzed for their key performance indicators. Seasonal data was obtained from Grand Valley's Athletics game statistics website. Data was analyzed through parametric statistical testing to determine the relationship between rebounds and points at the offensive and defensive ends. The results will be presented at SSD.

HENRY HALL ATRIUM 078

Are Defensive Key Performance Indicators Correlated to Winning for the GVSU Men's Basketball Team?

Participants attending 11:00 AM - 12:00 PM

Presenters: Mitchell Davignon, Jacob Mechling, Jordan Reid

Mentor: Ross Sherman

Background: There is a correlation between defensive variables and winning in basketball. Defensive variables include blocks, steals, offensive and defensive rebounds and points conceded. Research shows there is a larger impact for offensive and defensive rebounds, points off turnovers, and blocks when related to winning. Other defensive variables do contribute to the outcome of the game, but are not as influential. Purpose: The purpose of this study is to determine if defensive key performance indicators (KPIs) for the GVSU men's basketball team influence the outcome of the game. Methods: Game statistics for the GVSU men's basketball team from the 2017/18 season were analyzed using data obtained from the GVSU Athletics team statistics website. Data was analyzed using SPSS statistics software determining if there is statistical significance between defensive KPIs and winning. Results: The results will be presented during Student Scholars Day.

HENRY HALL ATRIUM 079

Effect of Coconut Water, Gatorade and Water on Rate of Rehydration Following Exercise Heat Stress

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenters: Madison Polen, Olivia Risko, Mackenzie Saville, Alex Sikora

Mentor: Ross Sherman

Rate of rehydration can impact both health and ability to perform a second bout of exercise. Determine whether post-exercise rehydration rate is altered by type of fluid ingested. Six males pedaled for 30 minutes in a heated

room to induce dehydration. Nude body mass, hydration and hematocrit were recorded pre- and post-exercise, as well as urine output 30, 60 and 90 minutes post-ingestion of water, Gatorade, or coconut water. Fluids were administered using a single-blind, randomized, cross-over design. The volume given matched body mass lost during exercise. Participants were tested on three separate occasions. Hematocrit ($p=0.042$) and urine output ($p=0.022$) showed a significant difference over time. No significant differences were found in rate of rehydration or other thermo-physiological markers when considering fluid type. There is no significant difference in rehydration rate when using coconut water, Gatorade, or bottled water.

HENRY HALL ATRIUM 080

Influence of Key Performance Indicators in Women's Volleyball Depending on Game Location

Participants attending 2:00 PM - 3:00 PM

Presenters: Caitlin Bainbridge, Olivia Risko

Mentor: Ross Sherman

Background: Key performance indicators are used to determine which actions play a significant role in an athlete or team's performance. The main key performance indicators that are applied in women's volleyball include block, dig, assist, kill, and serve (aces). Locations of the matches were determined to be home, away, or neutral, which can affect game outcome. Purpose: Each of the key performance indicators will be evaluated to determine which have the greatest influence on game outcome depending on the location during a season. Methods: A Division II women's volleyball season was assessed for key performance indicators to determine if the game outcome is influenced by the location of the match. Results: The results will be presented at Student Scholars Day.

HENRY HALL ATRIUM 081

Deformation of Laminae and Bedding in the Upper Ordovician Point Pleasant Formation in Kentucky

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM

Presenters: Ross Helmer, Cory Hughey, Kyle Meyer, Nicholas Priehs, Parker Sutton

Mentor: Peter Riemersma

The Point Pleasant Formation experienced localized deformation within its flat lying grainstone beds during the nearby Appalachian orogeny in the Ordovician Period. Within deformed zones, we observe ball and pillow structures potentially as a result of seismic activity causing sandy debris flows and liquefaction. We will be examining hand samples and thin sections from the Point Pleasant Formation to study the probable causes of deformation. Within these samples we will focus on the texture and structure of the laminae to determine what types of deformation have affected the material. Evidence of graded bedding would support a turbidite origin, while floating clasts in a fine grained matrix would suggest a debris flow origin or perhaps signify the influence of liquefaction. The layering of these structures will be used to hypothesize a probable series of events which led to the deformation we observe today.

HENRY HALL ATRIUM 082

Parallelizing FluidC, a Community Finding Algorithm

Participants attending 9:00 AM - 10:00 AM

Presenter: Ronald Rounsifer

Mentors: Jerry Scripps, Christian Trefftz

FluidC is an algorithm to find communities on networks (graphs). Like the Label Propagation algorithm, the algorithm must update one vertex at a time. Otherwise, the algorithm does not converge on bipartite graphs. We have parallelized the FluidC algorithm using OpenMP and good speed increases are observed. For the case of bipartite graphs, we revert to the sequential algorithm.

HENRY HALL ATRIUM 083

A Biogeological Analysis of Carbonate Microbialite Nodules That Form in Fish Lake, Southwestern Michigan

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM

Presenter: Nicholas Brown

Mentors: Tara Kneeshaw, Peter Riemersma

The intersection between the biologic and geologic realms can be found in the study of microbialites. We have explored the conditions that influence microbialite growth in an alkaline, lacustrine environment and provide insight into how cyanobacteria influence carbonate precipitation. Carbonate nodules are patchily distributed along the lake bottom of Fish Lake in southwestern Michigan. The nodules are covered with cyanobacteria and have a cauliflower appearance with a porous interior. Preliminary microscopy of the outer layer of microbialites reveals the presence of cyanobacteria with many thin filaments and a few thick filaments. Crystalline tubes visible around some thin filaments suggest that as cyanobacteria photosynthesize locally, carbonate is precipitated. Other authors have found similar nodule textures to reflect high photosynthetic growth rates. These modern day microbialites may give clues and glimpses into the past, as their ancestors provide the earliest evidence of life.

HENRY HALL ATRIUM 084

Effect of Facial Expression on Running Performance in Healthy College Age Students

Participants attending 11:00 AM - 12:00 PM

Presenters: Shelby Abbott, Lauren Hendricks, Makenzie Lamb, Stacey Metzger

Mentor: Ross Sherman

Background: It has been suggested that facial expression alters both oxygen consumption and perceived exertion while running at moderate to high intensity. However, very little research has been conducted on the effects of smiling on running performance. Purpose: The aim of this study is to determine if various facial expressions alter movement economy, physiological, and perceptual responses while running. Methods: Physically active GVSU students participated in this study. Participants completed three 5-minute steady state treadmill runs at 70% VO_{2max} with 2-minute rest periods. The three randomized conditions were control (neutral), smiling, and frowning. Smiling and frowning were induced for the full 5-minutes through the use of visual imagery. Running performance was assessed using HR, RPE, VO_{2} , and running economy. Results: Data will be presented at SSD.

HENRY HALL ATRIUM 085

Effects of Aerobic Exercise on Memory Capacity

Participants attending 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenters: Jordan Alger, Paige Arney, Taylor LeBeau, Alyson Peters

Mentor: Ross Sherman

Background: It has been suggested that aerobic exercise increases cognitive function and improves memory.

Purpose: The objectives of this study are to determine the differences between moderate and high intensity exercise, as well as physiological stimulation on memory. Methods: Healthy, active GVSU college students will participate in this study. Baseline memory was taken in a controlled lab using a randomized list of 20 words. Upon completion of the 20 minute intervention (both moderate [50% HRmax] and high [70% HRmax] intensity exercise, and seated rest), memory was assessed. Following a subsequent 15-minute interval (a video will be shown during this time) memory will be assessed to determine the effects of exercise after returning to metabolic steady-state. Heart rate was assessed every minute throughout exercise to maintain the desired intensity, while RPE was taken every five minutes to measure perceived exertion. Results: Data will be presented at SSD.

HENRY HALL ATRIUM 086

BCAA-Taurine Supplementation Provides Limited Benefit to Recovery Following Eccentric Exercise

Participants attending 12:00 PM - 1:00 PM

Presenter: Morgan Kennedy

Mentor: Ross Sherman

Prolonged intake (> 7 days) of branched-chain amino acids (BCAAs) and taurine improves recovery from eccentric exercise. However, it is unclear if a single day's pre-exercise intake is beneficial. PURPOSE: To assess the impact of a single dose of BCAAs and taurine on soreness, inflammation, and performance. METHODS: 40 recreationally active people were equally and randomly divided into four double-blind groups – BCAAs and taurine (BCAA-Tau); BCAAs only; taurine only (P-Tau); and placebo. After 48-h rest and pre-exercise supplement intake, participants completed 3x12 65% 1-RM back squats, 3x12 weighted alternating leg lunges, and 5x10 18" depth jumps. Soreness, inflammation, and performance were assessed 1, 4, 24, 48 and 72-h post-exercise. RESULTS: Perceived soreness reduced after BCAA-Tau compared to P-Tau ($p=0.097$), and jump height was higher after BCAA-Tau compared to placebo ($p=0.074$). CONCLUSION: There is limited benefit from a single pre-exercise ingestion of BCAAs and taurine.

HENRY HALL ATRIUM 087

Chemical Composition of Canine Scent Detection Essential Oils by GC-MS

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenters: Delaney Johnson, David Mugica-Canos

Mentor: Laurie Witucki

Essential Oils (plant extracts) have been of interest to humans for thousands of years. They are currently used for medical treatments, aromatherapy, cosmetics, and dietary supplements. Essential oils are also used in training and competition for canine scent discrimination—a new sport modeled after the professional use of dogs as scent detectives by law enforcement, search and rescue organizations, and the military. In the sport of canine Nosework the dog is trained to locate essential oils hidden in various settings including containers, vehicles, interior, or exterior search areas. The essential oils used in UKC (United Kennel Club) competition are Birch, Anise, Clove, Myrrh, and Vetiver. This research focuses on the chemical analysis of these oils using Gas Chromatography-Mass Spectrometry (GC-MS). We present here a comparison of purity and analysis of the constituents found in the various essential oils across different brands and suppliers, isolation techniques, and sample age.

HENRY HALL ATRIUM 088

Effects of Social Isolation on the Aggression of Crayfish

Participants attending 12:00 PM - 1:00 PM

Presenters: Lauren Kavner, Alexander Phillips

Mentor: Daniel Bergman

Aggressive interactions between animals are believed to be exacerbated by social isolation. The goal of this study was to determine if there is a difference in the aggressive behavior of crayfish that are socially isolated versus those living among other crayfish (termed social crayfish). Aggression was assessed by comparing the interactions between two groups of social crayfish, two groups of isolated crayfish, and a group of social crayfish versus a group of isolated crayfish. To reduce size biases, crayfish were matched by mass within 5% of each other and then allowed to interact in each trial. After a 15 minute acclimation to a separated environment, the animals were allowed to interact for 20 minutes. The intensity of each interaction was recorded using a behavior ethogram for aggression. Information from this study will be utilized to improve our understanding of how behavior is affected by social isolation.

HENRY HALL ATRIUM 089

Constructing Interesting Integer Sequences

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenters: Shannon Napier, Liah Renaud

Mentor: Steven Schlicker

The purpose of our project is to explore variations of configurations and their corresponding sequences. A configuration is a special type of arrangement of finite sets and, furthermore, configurations of sets can be used to generate interesting examples of sequences of integers. We focus on identifying a family of string configurations that we call crosses. We then focus on proving what their corresponding integer sequences will be, and confirming if these known - or previously unknown - sequences have any interesting connections to other branches of mathematics.

HENRY HALL ATRIUM 090

Study of Organometallic and Phosphine Ligand Synthesis and Determining Chelation Properties

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenter: Kyle Korman

Mentor: John Bender

In a world that is rampant with throw-away culture, vast amounts of precious, expensive, or even dangerous elements are being discarded improperly. This research includes the synthesis of organometallic and phosphine compounds, and studying their chelation properties to recover precious metals from waste.

HENRY HALL ATRIUM 091

How Does Climate Change Affect Tornado Intensity and Frequency in the Midwest?

Participants attending 3:00 PM - 4:00 PM

Presenters: Samuel Hiestand, Ethan Mulnix, Morgan Rushing, Eric Vaitkevicius

Mentor: Elena Lioubimtseva

The purpose of our presentation is to address how climate change affects tornado intensity and frequency in the Midwest. This study will test the idea that the frequency of tornadoes has declined as a result of climate change, but in turn, has increased the intensity of those tornadoes. We are examining why and how this natural phenomenon is being altered and also how to research and interpret any tornadic data. We are going to be in contact with several storm chasing and meteorologist experts who are knowledgeable about tornadogenesis and how to conduct online research. This will help us understand how climate change is affecting the key ingredients in tornado formation. Our group is going to be studying various charts, graphs, maps, and model output data in order to understand how regional weather and atmospheric factors change the Midwestern climate. Lastly, we hope to be able to depict from our results if our hypothesis is correct or not for tornado frequency and intensity.

HENRY HALL ATRIUM 092

Tigers and Lions and Bears, Oh My! : Assessing Enrichment Protocols for Carnivores at the John Ball Zoo

Participants attending 4:00 PM - 5:00 PM

Presenter: Francesca Golus

Mentor: Jodee Hunt

Enrichment programs can benefit the well-being of captive animals by stimulating positive behaviors and reducing stereotypic ones. Understanding the effects of enrichment on behavior enables keepers to optimize the benefits of enrichment programs. We explored the effects of enrichment on the frequency and duration of positive and negative behaviors in five species of carnivore at the John Ball Zoo. Enrichment programs utilized food, sensory, and manipulable objects, and different times of day. Species differed in total activity (positive behaviors were observed more than negative ones). Presentation of enrichment had an inconsistent effect on the two types of behaviors, except in individual Grizzly Bears. The complexity of most enclosures at this zoo provide rich environments with features that add spatial complexity, which appear to strongly influence carnivore behavior. We recommend continuing enrichment with efforts to enhance the spatial and sensory complexity of enclosures.

HENRY HALL ATRIUM 093

Progress Towards Synthesis and Isolation of Phenoxy Vinyl Ether Bound Iron Centers For Use in Future Kinetic Studies

Participants attending 3:00 PM - 4:00 PM

Presenters: Andrew LaDuca, Christopher Peruzzi

Mentor: Stephen Matchett

Asymmetry in the coordination of olefins to metal centers has direct implications for the reactivity of the resulting metal-olefin complexes. As part of a larger project looking at asymmetric iron olefin complexes, recent work in the development of a promising, alternative synthetic route to phenoxy vinyl ether bound iron centers will be presented. An analysis of the reaction conditions, yields, and reactivities will be discussed.

HENRY HALL ATRIUM 094

A Membrane Sensor Protein Alters Adhesion and Biofilm Formation in *C. albicans*

Participants attending 11:00 AM - 12:00 PM

Presenter: Julia Bennett

Mentor: Ian Cleary

The opportunistic fungal pathogen *Candida albicans* grows in various human host environments ranging in factors such as pH, oxygen concentration, and osmotic strength. The cell responds to these stimuli by sensing changes at the cell membrane. The gene *orf19.6705* is predicted to encode a cell membrane sensor protein and could therefore play a role in how *C. albicans* successfully adapts to its varied surroundings. When we deleted both copies of this gene we found that the adhesive properties of hyphae were altered with increased cell adhesion and biofilm formation in some media. In other media cell adhesion and biofilm formation was decreased, suggesting that the protein can activate or repress signaling pathways depending on the stimulus. We also saw changes in the appearance of embedded growth filamentation. Collectively these results reinforce the function of this protein as a sensor, and we are continuing our analysis examining changes in gene expression of surface adhesions.

HENRY HALL ATRIUM 095

Is Soybean More “SLEEPY” than Arabidopsis? : Examining the Expression of Two SLY1 Orthologues in Soybean

Participants attending 2:00 PM - 3:00 PM

Presenter: Samuel Henson

Mentor: Pei-Lan Tsou

Giberellic acid (GA) is an important plant hormone. Sleepy 1 (SLY1) functions as a positive regulator of GA signaling in *Arabidopsis*. SLY1 is an F-box protein that is up regulated in response to increased bioactive GA and functions by degrading DELLA proteins. These DELLA proteins, RGA and GAI, inhibit GA signaling. We have identified GmSLY1a and GmSLY1b, two orthologs of SLY1 in soybean. Both of these putative orthologs contain an F-Box motif as well as several other domains found in the *Arabidopsis* SLY1 protein. To determine the function of the orthologues, we measured the relative expression of GmSLY1a and GmSLY1b in different soybean tissues and compared them to the expression of SLY1 in *Arabidopsis*. The *sly1* mutants in *Arabidopsis* result in a dwarf phenotype and show variable seed dormancy. We also transformed both genes into *Arabidopsis sly1* mutants to further analyze the soybean ortholog and assess their ability to rescue the *sly1* mutant phenotype in *Arabidopsis*.

HENRY HALL ATRIUM 096

An Automated but Simple Method of Recording the IV Curve of PV Devices

Participants attending 10:00 AM - 11:00 AM

Presenter: Kenneth David

Mentor: Douglas Furton

Photovoltaic (PV) devices, or solar cells, have become popular because they are a good source of renewable energy. Although PV devices all operate on the same principle, each cell responds differently to light. The main way to characterize a PV cell is to measure the IV curve, which describes how the current (I) and voltage (V) of the device are related. Many characteristics of the device can be derived from the IV curve. The standard way to record an IV curve requires several different instruments. The method we have developed, however, requires only a large capacitor and a logging voltmeter. In this method, the PV device charges an initially uncharged capacitor while the voltmeter records the voltage across the cell over time. The current is then calculated with the relation $I = C \cdot dV / dt$. The IV curve measured with this method is reasonably similar to that of the standard method. Therefore, this method could be an alternate method to characterize PV devices.

HENRY HALL ATRIUM 097

How Much Dutch? The Linguistic Landscape of Holland, Michigan

Participants attending 3:00 PM - 4:00 PM

Presenter: Richard Vegh

Mentor: Kathryn Remlinger

This study examines the intersection of language use, language attitudes, identity, and tourism in public spaces to understand their effects on what it means to be “local” and to discursively reimagine Holland as a “Dutch” city. This reimagining affects particular ways of understanding larger sociocultural meanings about ethnicity, place, and their relationship to language use and language attitudes. Preliminary findings demonstrate that the linguistic landscape functions not only to promote the city and local events but also to sell the idea of a sense of place and a local identity.

HENRY HALL ATRIUM 098

EHR Usability

Participants attending 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM

Presenters: Jamie Cole, Shreya Paithankar

Mentors: Raymond Higbea, Guenter Tusch, Marie VanderKooi

Healthcare organizations may reap substantial benefits when transitioning to electronic health records (EHRs), such as decreased healthcare costs and better care. However, severe unintended consequences from implementation and design of these systems have emerged. Poorly implemented EHR systems may endanger the integrity of clinical or administrative data. That, in turn, can lead to errors that may jeopardize patient safety or decrease quality of care. Poor design quality of EHRs can significantly increase the mental workload of clinicians, thereby increasing frustration, reducing user satisfaction, and causing unproductive workarounds. We conducted a literature study with the aim to determine how EHR implementation and design can impact clinical use, workload, patient safety, and quality. This research contributes to effort on how to improve accuracy, reliability, and integrity of healthcare information as stored in EHRs.

HENRY HALL ATRIUM 099

Assessing Vertical Jump Height in Response to Acute Self Myofascial Release

Participants attending 11:00 AM - 12:00 PM

Presenters: Andrew Borja, Jacob Sobeck, Jacob Sommers

Mentor: Kyle Barnes

Myofascial release has been shown to reduce muscle soreness and improve overall range of motion. Devices such as the Roll Recovery (R8), have been put into practice to initiate a myofascial release by using rollers that apply uniform and constant pressure to target affected areas with ease of use. The purpose of this study was to take the principles of myofascial release using the R8 device and apply to vertical jump performance compared to strictly rest conditions. 14 college-aged students completed four maximal vertical jump height tests separated by 7-14 days in a randomized crossover design. Initially, subjects completed a baseline vertical jump height test followed by either 6-min rest or a standardized myofascial release routine using the R8 device on the lower extremities, followed by another max jump test. Data collection is ongoing and results will be presented at Student Scholars Day.

HENRY HALL ATRIUM 100

Effect of Transcutaneous Electrical Nerve Stimulation on Muscle Soreness

Participants attending 9:00 AM - 10:00 AM

Presenters: Sabrina Ahmad, Olivia Oravitz, Maura Wassermann, Kyle Zwarych

Mentor: Kyle Barnes

Background: Exercise causes damage to muscle tissue which results in exercise induced pain that can be treated with transcutaneous electrical nerve stimulation (TENS). Typically low frequencies around 60 Hz with an undulating protocol are used to bring endorphins to the damaged area to reduce pain. Purpose: To investigate the effects TENS has on muscle soreness following a bout of vigorous physical activity. Methods: 8 physically active college students completed 10 high-intensity sprint intervals on a treadmill with a -5% grade in addition to box step ups to create muscle induced soreness. Subjects were randomly placed into a TENS or control group. Following physical activity, the TENS group received 30 min of TENS at 60 Hz modulated protocol. Muscle soreness of the vastus medialis and vastus lateralis was measured subjectively using a pain scale and objectively using a pressure algometer. Data collection is currently ongoing and results will be presented at Student Scholar Day.

HENRY HALL ATRIUM 101

Effects of Caffeinated Gum on Power Output

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenters: Allison Armstrong, Kaylee Wilson

Mentor: Kyle Barnes

Caffeine is known to be the most widely consumed ergogenic aid for athletic and cognitive performance. Caffeine increases the release of certain stress hormones, subsequently increasing sympathetic activity by increasing heart rate, and allowing for a higher muscular output. Recent research has shown caffeinated gum speeds up these affects by increasing the absorption rate through the buccal mucosa in the mouth compared to through the gut with traditional forms of caffeine. Though caffeine is consumed in many different forms, the effects of caffeinated gum on power performance are relatively unknown. In this study, subjects consumed either 200 mg of caffeinated gum for 5 minutes, 30 minutes before participating in a Wingate cycle ergometer test, or no gum, one week apart in a cross-over design. Data is currently being collected and will be presented during Student Scholars Day.

HENRY HALL ATRIUM 102

Evidence of Silurian Relative Sea Level Change in the Bisher Formation of Northeast Kentucky

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM

Presenters: Marissa Buehler, Jessalyn Gonzalez, Montana Hauke, Jakob Szilagyi

Mentor: Peter Riemersma

A distinct unconformity between the Bisher Formation and overlying Ohio Black Shale provides evidence of a drastic change in sea level. The Ohio Black Shale has been interpreted to represent deposition in deeper waters of an anoxic basin while the Bisher Formation is composed of dolostone, which represents shallow marine conditions. Our goal is to assess if the unconformity was formed during a period of low sea level or during a rising transgressive sea. We will use thin sections and hand samples to describe the lithology and texture of the Bisher formation with an emphasis on the nature of the unconformity at the top of the Bisher. The top is burrowed, contains pyrite, and has evidence of oil staining. A literature review will provide criteria and features to look for within the outcrop and in

our samples to identify if the unconformity was erosively formed during sea level fall or generated under conditions of decreased deposition and reworking during sea level rise.

HENRY HALL ATRIUM 104

Effects of Motivational Videos on Peak Anaerobic Performance

Participants attending 9:00 AM - 10:00 AM

Presenters: Garrett Beaudry, Sam Goethals, Zach Hill, Derek Simon

Mentor: Kimbo Yee

Background: There is limited knowledge on the effect of motivational videos on peak anaerobic performance. Aim: To determine the effect of watching motivational videos on peak anaerobic performance as determined by the Wingate Anaerobic Test and 1-repetition maximum (1RM) bench press. Methods: Using a crossover study design, eight undergraduate students were randomly assigned to a control, no motivational video condition or the motivational video condition. Immediately after both conditions, peak anaerobic performance from the Wingate Test and 1RM bench press. Results: There was a significant difference in 1RM bench press between the conditions ($p=0.018$), but there was no significant difference between the two conditions in peak power or mean power ($p=0.163$ and $p=0.309$, respectively) from the Wingate Test. Conclusion: Watching a motivational video increased 1RM bench press performance, but did not improve performance for the Wingate Test.

HENRY HALL ATRIUM 105

Understanding the Application of Polarity Thinking by Nurses in a Clinical Setting

Participants attending 1:00 PM - 2:00 PM

Presenter: Lauren King

Mentor: Evelyn Clingerman

The aim of this research was to understand nurses' experiences of applying polarity thinking in clinical settings. We sampled nurses who attended at least 8 hours of polarity education. We used a classical grounded theory methodology to identify themes in narrative one-on-one interview data. Using a constant comparative analysis technique, we analyzed transcribed interviews. Our findings reveal three broad themes: (1) Process of knowing; (2) Practice using; and (3) Deepening knowledge, and 10 subthemes: (1) Attending workshops; (2) Reading about; (3) Recognizing the reoccurrence of problems; (4) Recognizing barriers and facilitators; (5) Gaining confidence; (6) Increasing skill; (7) Trying it out; (8) Seeking validation; (9) Acquiring more education; and (10) Intentional use. Data reveal comfort and confidence increased as resources increased and that consequences were intentional use and identification of specific polarities.

HENRY HALL ATRIUM 106

Woman v. Woman: Gendered Rhetoric and Exemplary Discourse in Roman History

Participants attending 10:00 AM - 11:00 AM

Presenter: Sydney Strablow

Mentor: William Morison

Very little writing by women survives from Ancient Rome, with the result that the lives of women have been constructed largely from a male perspective. Furthermore, historical writers in antiquity often stated that their purpose in writing was to record the deeds of men. The antithetical inclusion of women at critical, transformative moments in the historical narrative, therefore, merits examination. Historians often used women as exemplars of

societal values; in both active and passive instances, women illustrated virtuous ideals or the consequences of vice. Historians also praised women for interceding in public life when men were incapable of resolving conflict. By analyzing various literary and material sources from the 1st century BCE through the 2nd century CE, including ones authored by women, my research will examine the conflicting and ambiguous ways in which Romans evaluated the role of women in society and how women interacted in public life during turbulent political and social climates.

HENRY HALL ATRIUM 107

Study of the Behavior of Positronium in Metal-organic Frameworks at Low Temperatures and Pressures

Participants attending 11:00 AM - 12:00 PM

Presenter: Tyler Wheeler

Mentor: Richard Vallery

When positronium (Ps) is implanted into a metal organic framework (MOF) it exists in a delocalized state, which allows Ps to escape the MOF lattice. To determine the porosity of a MOF by using Positron Annihilation Lifetime Spectroscopy we add a buffer gas to stop Ps from escaping the lattice by forcing it to localize in the MOF's pores. However, Ps annihilation with the buffer gas deviates from the expected linear increase with gas density and, interestingly, such experiments show that Ps pickoff is absent at cryogenic temperatures and low pressures. As such, the aim of our study was to investigate this peculiar finding by exploring the behavior of Ps in MOFs over a range of pressures up to 1000 psi and temperatures from 70 C to -230 C. This allowed us to discover when this anomaly begins to manifest, and whether the effect turns on suddenly or gradually.

HENRY HALL ATRIUM 108

Expression and Ligand Binding Analysis of BshC, an elusive Enzyme Involved in Bacillithiol Production

Participants attending 11:00 AM - 12:00 PM

Presenter: Alanna Kenny

Mentor: Paul Cook

Fosfomycin is an antibiotic that inhibits bacterial cell wall synthesis. Bacteria have developed resistance to this antibiotic. Fosfomycin resistance enzymes catalyze the addition of bacillithiol to the antibiotic rendering it inactive. Bacillithiol biosynthesis consists of a three-step pathway. The first two enzymes have been described. The third, BshC, has proven difficult to characterize. Our goal was to explore BshC ligand-binding using tryptophan fluorescence assays and express the protein in a *Bacillus subtilis* system. Tryptophan fluorescence assays demonstrated that a R504K mutation in *Bacillus subtilis* BshC diminished citrate binding. Citrate binding of BshC in *Deinococcus radiodurans*, a *Bacillus subtilis* homolog, was observed. *Bacillus subtilis* was successfully transformed with the BshC gene, however protein expression has yet to be observed. Further characterizing the third enzyme in this biosynthetic pathway will bring insight into therapies to combat fosfomycin resistance.

HENRY HALL ATRIUM 109

Nurses Managing Patients with Insulin Pumps – Fear or Facts?

Participants attending 9:00 AM - 10:00 AM

Presenter: Jackson Desgranges

Mentor: Melodee VandenBosch

The incidence of diabetes is estimated to be 29 million people in the US. Of these people, roughly 40% use an insulin pump to manage diabetes. Insulin pumps are designed to be used in the outpatient setting, but with their growing popularity they are making frequent appearances in the hospital setting. The American Diabetes Association recommends that hospitals allow patients to continue using insulin pumps while they are in the inpatient setting if they meet certain criteria. Nurses are not always familiar with the various types of insulin pumps that patients wear, and this can cause a safety issue for patients wishing to continue wearing pumps while hospitalized. Because insulin pumps are patient specific, it is unreasonable to expect a nurse to know how to effectively manage a pump for each patient. The purpose of this project is to review the current literature related to nursing management of inpatient insulin pump use and the nursing implications to inform hospital policy.

HENRY HALL ATRIUM 110

Computational Exploration of Ni-Catalyzed C-N Bond Formation

Participants attending 9:00 AM - 10:00 AM

Presenter: Mark Janiga

Mentor: Richard Lord

Transition metal catalysis aids in the construction of new bonds to carbon. The precious metals palladium and platinum are commonly employed in these types of reactions. We are attempting to get third row transition metals to behave like these precious metals, and we are interested in nickel specifically. To do this, we used the density functional theory to calculate the optimization of the molecular geometry and frequency of our molecules to determine a favored pathway. With nickel, two pathways can occur: (i) nickel can undergo oxidative addition from Ni(II) to Ni(IV) to activate the bonds or (ii) nickel can undergo one electron redox and form either open shell Ni(I) or Ni(III) and one of these activate the reactants. Thermodynamic calculations and comparison of small model (PH₃) and large model (PPh₃) nickel complexes will be analyzed to determine the favored pathway.

HENRY HALL ATRIUM 111

Effects of Obesity on the Seminal Vesicle in Mice

Participants attending 2:00 PM - 3:00 PM

Presenter: Amanda Slowik

Mentor: Christopher Pearl

The seminal vesicle is essential for male fertility. The seminal vesicle contributes to the production of seminal fluid, which carries sperm and provides nutrients sperm need to be viable in the female tract. This study investigates the effects of obesity on the seminal vesicle by examining mice genetically deficient in leptin hormone (Ob) and leptin receptor (db). Mice were purchased at 4wks, raised until 16wks of age and allowed food and water at will. At 16wks seminal vesicles were weighed, PASH stained and analyzed morphologically. The seminal vesicle weights in the Ob ($0.12 \pm 0.01\text{g}$) and db ($0.13 \pm 0.03\text{g}$) groups were significantly smaller than the C57 control group ($0.23 \pm 0.01\text{g}$). Epithelial cells, invagination, and smooth muscle morphology is being investigated to determine additional differences. Reduced seminal vesicle weight in obese groups suggest there may be reduced testosterone secretion and seminal fluid production which likely contributes to reduced fertility in obese mice.

HENRY HALL ATRIUM 112

Effects of Peppermint Oil on Athletic Performance in College Students

Participants attending 1:00 PM - 2:00 PM

Presenters: Nicole Janiga, Sabrina Rodriguez

Mentor: Ross Sherman

Background: Mint is understood to have anti-inflammatory, antioxidant, and vasoconstrictor effects, and could be beneficial for athletes by reducing pain and perceived effort, as well as improving focus and mood. However, recent research has suggested ambiguity about peppermint use. Purpose: The purpose of this study is to determine if inhalation of peppermint elicits an increase in physiological function and athletic performance. Methods: Healthy, active college students volunteered to perform four tasks: dominant hand-grip strength, 400-m dash, push-ups to exhaustion, and vertical jump with and without peppermint. The peppermint was administered using concentrated, 100% therapeutic grade peppermint essential oil placed on an adhesive strip, which was then stuck to the upper lip. Rating of perceived exertion and lung function were also determined pre- and post-performance tasks. Results: Data will be presented at SSD.

KIRKHOF CENTER GRR 001

Using ArcMap to Compile a Database of Non-Governmental Organizations in Haiti Working on Water Treatment, Sanitation, and Agricultural Projects.

Participants attending 3:00 PM - 4:00 PM

Presenter: Thuy-Thuong Nguyen

Mentor: Peter Wampler

Estimates of the number of non-governmental organizations operating in Haiti range from hundreds to 10s of thousands. In 2010, NGOaidmap.org reported there were 93 operating non-governmental organizations in Haiti working on different environmental projects. The same year, The Center for Global Development reported there were over 20,000 NGOs. It is clear that a more complete, up to date, and accurate database of NGOs in Haiti is needed. Although the Haitian government maintains a database of NGOs, it also suffers from data quality problems. Using ArcMap GIS, existing databases, and internet research, a database of organizations working in Haiti will be compiled. This database will include project locations where available. The new database will provide a better understanding of how many NGOs are working in Haiti and provide data on specific water treatment and sanitation interventions being implemented.

KIRKHOF CENTER GRR 002

Socio--Cognitive Deficits in School--Age Victims of Peer-Peer--Aggression

Participants attending 9:00 AM - 10:00 AM

Presenters: Caroline Bartes, Jenna Beffel, Jenna Bekkala

Mentor: Naomi J. Aldrich

The current study examined 7- to 13-year-olds' experiences of traditional and cyberbullying with a focus on whether children who repeatedly harm others have advanced perspective taking skills or display social cue misinterpretations. Contrary to expectations, amounts of victimization—not bullying behaviors —were significantly related to deficits in socio-cognitive abilities.

KIRKHOF CENTER GRR 003

Key Motifs of DUSP8 Determines its Subcellular Localization and Activity

Participants attending 1:00 PM - 2:00 PM

Presenter: Christiana D'Annibale

Mentor: Ruijie Liu

This study analyzed the expression and induction of dual specificity phosphatase (DUSP) genes in cardiac cells, and studied their activity and stability using DUSP8 as an example. DUSPs were found to be expressed in both neonatal myocytes and fibroblasts, and their expression was significantly increased upon phenylephrine stimulation. Moreover, alanine substitution of KRR in the N terminal region of DUSP8 significantly led to increased phosphorylation of ERK1/2, p38, and JNK. The KRR mutation of DUSP8 did not alter its subcellular distribution, but rather slightly decreased its binding to inactivate ERK1/2, p38 and JNK. Moreover, DUSP8 was found to be degraded at baseline or after phenylephrine stimulation. Further analysis of the contribution of PEST motif in the C terminal of DUSP8 will help understand the molecular mechanism for the stability of DUSP8. Together, DUSP8 is expressed in both myocytes and fibroblasts, induced and degraded to fine-tune the MAPK activity in the cells.

KIRKHOF CENTER GRR 004

One Nation Overdosed

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenter: Nicole Gustin

Mentor: Meridell Gracias

Addiction is a largely preventable disease, but in June of 2017, drug overdose became the leading cause of death in Americans under age 50. The United States represents less than 5% of the world population, yet we consume more than 80% of the opiate supply. Since 2010, the number of opioid related deaths in Kent County has been on the rise, with 80% of heroin addicts in Kent County admitting their addiction began with a pain prescription. My project addresses opioid prescribers and challenges them to use a questioning attitude when prescribing opiates.

KIRKHOF CENTER GRR 005

Coastal Flooding of Southeastern Florida

Participants attending 9:00 AM - 10:00 AM

Presenter: Austin Swiatek

Mentor: Elena Lioubimtseva

The purpose of this study was to highlight coastal flooding along the southeastern Florida region. The study area I am focusing on is the southeastern Florida Metropolitan Statistical Area. I plan to use the data I collected to show how susceptible to floods southeastern part of Florida is. The methods I used were to highlight elevation, precipitation, flood hazards, total population, and to use land classification of the land use. ArcMap software was used to create these maps. The data came from multiple places. Elevation came from USGS website. Precipitation and land use data came from USDA Natural Resources Conservation Service website. Flood hazards data was retrieved through ArcGIS online. Lastly total population data was retrieved from census data in ArcGIS Business Analyst Network. This project will help give planners of the area an idea of what they have to work against to create safe and stable communities.

KIRKHOF CENTER GRR 006

Increase in Spontaneous Motor Activity After Decapitation in *Hdc* Mutants of *Drosophila* Suggests a Neuro-modulatory Role for Histamine

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenters: Felicia Bozman, Dominador Uy

Mentor: Martin Burg

The gene *Hdc* encodes the enzyme histidine decarboxylase, which is essential for the production of histamine. Through the study of *Hdc* mutants in *Drosophila*, histamine has been shown to play a role in photoreceptor function, temperature selection, and courtship effectiveness. Thus far, there has not been any investigation examining the role of histamine as a modulator of excitability in the nervous system. Previous experiments demonstrated that decapitated flies lacking histamine exhibited more spontaneous movement compared to decapitated wild type flies. To determine whether this effect is due to a reduction in the level of histamine, 2 additional mutants of the *Hdc* gene were examined: *HdcP218* and *HdcP211*. At various ages, mutant flies were decapitated and their spontaneous motor activity was shown to be increased when compared to similarly treated wild-type flies. This result suggests that removal of histamine leads to a decreased inhibitory function in the central nervous system.

KIRKHOF CENTER GRR 007

Synthesis and Characterization of Novel Diphenyl Urea Compounds

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM

Presenter: Phillip Dietz

Mentor: Matthew Hart

To combat the currently present resistant strains, more antibiotic treatments must be developed. The goal for this project is to investigate a new family of antibacterial compounds based around a diphenyl urea scaffold. Functionalization of the phenyl groups offers opportunity to create a new class of antibiotics with varied functional groups offering differing effectiveness and medicinal properties. Stemming from previous work by students in this group, this work focuses on variation of an ester group on ring. Developing a structure activity relationship (SAR) can be used to direct future modifications on the base structure to develop more effective compounds. The diphenyl urea compounds will be surveyed through Kirby Disk Diffusion tests and minimal inhibitory concentration tests (MIC) to develop their effectiveness.

KIRKHOF CENTER GRR 008

Patterns of Reproductive Failure in Tree Swallows

Participants attending 10:00 AM - 11:00 AM

Presenters: Kara Krupp, Emma Sachteleben

Mentor: Michael Lombardo

To determine if there was a pattern of reproductive failure in Tree Swallows, we monitored the reproductive performance of swallows nesting in bird boxes on the GVSU campus from 1992-2017. We counted the number of eggs laid, hatching success, nestling survival from hatching to banding (ND1 to ND12) and from ND12 to fledging (ND20). Hatching success (69.3% eggs hatched), nestling survival from ND1 to ND12 (85.5% survived), and nestling survival from ND12 to ND20 (87.7% survived) did not change significantly over time. However, hatching success was significantly lower than nestling survival from ND1 to ND12 which was significantly lower than nestling survival from ND12 to ND20. These results indicate that reproductive failure is most likely during the egg stage. The reason why nearly one-third of Tree Swallow eggs do not hatch remains unknown.

KIRKHOF CENTER GRR 009

Sexing with the Metacarpal: A Cross Populational Comparison Study

Participants attending 9:00 AM - 10:00 AM, 11:00 AM - 12:00 PM

Presenters: Anthea Mitchell, Victoria Zellar

Mentor: Gwyn Madden

In 2014, Strowenjans et al. analyzed the metacarpals for sex determination from Verteba Cave, associated with the Trypolie Culture, located in Western Ukraine. At the time the minimum number of individuals was 36. As of 2017, with the addition of four field seasons, the MNI has risen to 189 and new excavations have uncovered an additional 60 metacarpals for analysis. The current research builds on Strowenjans et al's previous analysis to aid in determining sex of the newly recovered remains. Methods tested include Lazenby 1994, Scheuer and Elkington 1993, Stojanowski 1999, Barrio et al. 2006, McFadden and Bracht 2009, Manolis et al. 2009, Khanpetch et al. 2012, Nathena et al. 2015 and Falsetti 1995. 'Standards' methods were used to assess the sex of all 4480 commingled bones; when applicable, a comparison is made for these estimates to the metacarpal sex estimates.

KIRKHOF CENTER GRR 010

Chiral Separation of Silanes via Capillary Micellar Electrokinetic Chromatography

Participants attending 12:00 PM - 1:00 PM

Presenter: Sydney Shavaliar

Mentor: Andrew Lantz

Chiral silanes are relevant in organometallic and pharmaceutical chemistry due to potential drug delivery abilities and uses in stereoselective synthesis. Capillary electrophoresis (CE) is an attractive method for chiral separations due to its efficiency and high resolving power, with advantages over common analytical methods such as HPLC. Micellar electrokinetic chromatography (MEKC) is a type of CE which involves the use of micelles, surfactants, and chiral selectors to promote separations. Here, we develop a method to separate novel chiral silanes using chiral MEKC. Successful chiral separations were achieved for two different chiral silanes, (menthoxy)(methyl)(naphthyl)phenylsilane and (butyl)(menthoxy)(methyl)phenylsilane, using cyclodextrins and surfactants as additives in a non-aqueous methanol solvent. Progress has also been made regarding the exploration of semi-aqueous solvents and reverse polarity experiments with a third novel silane, (hydroxyl)(methyl)(phenyl)vinylsilane.

KIRKHOF CENTER GRR 011

Generation of *pHdc*-eGFP Transgenic Flies to Identify Functional Regions of the *Hdc* Gene in *Drosophila melanogaster*

Participants attending 1:00 PM - 2:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenters: Mikaela Berg, Ronald Raymo, Alexis Wilson

Mentor: Martin Burg

The purpose of this study is to identify specific functional regions in the upstream promoter region of the *Hdc* gene to better understand how its expression is regulated. This is being accomplished by using the 'upstream' genomic region of the *Hdc* gene to induce expression of the eGFP gene. Transgenic flies were generated by injection of two *pHdc*-eGFP transgenes containing the entire (long) or truncated (short) form of the *Hdc* promoter region. Following identification of the flies, true breeding genetic fly lines were established and subjected to linkage analysis. From this work, pure breeding lines have been established for the long (8 lines) and short (7 lines) forms, mostly located on the 3rd and X chromosomes. Examination of eGFP expression in each of these lines will determine whether the short form *pHdc*-eGFP transgene contains all the functional information that the long form *pHdc*-eGFP transgene is known to contain.

KIRKHOF CENTER GRR 012

The Art of Translation: Not Just Words on a Page

Participants attending 2:00 PM - 3:00 PM

Presenter: Emily Heyburn
Mentor: Diane Rayor

To increase awareness of the art and skill of translation, I examine various English editions of Euripides' *Hecuba* and translate a stanza directly from the Greek original in two versions. One is a literal translation (as close as possible to the original); the other is a literary translation (audience-oriented artistic rendition). Through this process, in conjunction with the examination of other translations, I analyze some of the decisions that translators make while translating. For this analysis, I also draw from secondary scholarship on translation studies. The project highlights the importance of the original text and the ways that the choices translators make can stray from or draw near to the original, changing, making, or reinforcing meaning. One of the conclusions of the project is that every act of translation is ultimately a reception of the original text.

KIRKHOF CENTER GRR 013

WatchBuddy: A Safety-Minded Workout App for Apple Watch

Participants attending 9:00 AM - 10:00 AM

Presenter: Bekah Suttner

Mentor: Jonathan Engelsma

WatchBuddy is an Apple Watch application designed to increase safety during solo workouts. The application sends location updates to trusted "buddies" throughout the workout to help your friends keep track of your location and make sure you return home safely after a workout.

KIRKHOF CENTER GRR 014

Timing is Everything: Influence of Enrichment on End-of-Day Behavior

Participants attending 3:00 PM - 4:00 PM

Presenter: Taylor Orr

Mentor: Jodee Hunt

Zoos and aquaria often provide sensory, food or manipulable enrichment to animals in their care. Enrichment can increase the expression of "positive" behaviors that enhance animal well-being. Caretakers know that individual animals may also express "negative" behaviors near end-of-day, before transference to nighttime facilities. Upon examination, enrichment influenced end-of-day behaviors only slightly if offered when animals were initially released into their enclosures, but had a stronger, positive effect if offered later in the day. Enrichment has the potential to alleviate negative end-of-day behaviors, but individual animals vary in the plasticity of their responses, and that the specific timing and type of enrichment influences its efficacy.

KIRKHOF CENTER GRR 015

Effects of Action and Inaction Priming: Motor and Cognitive Output

Participants attending 2:00 PM - 3:00 PM

Presenter: Alysha Burd

Mentor: Katherine Corker

We aim to replicate Albarracín et al. (2008), Study 7, which demonstrated that action priming causes increased cognitive output when the need for action goes unsatisfied. We conducted a multi-site direct replication of this study (approximate $N = 1,685$). Data collection is complete and we are currently analyzing the results, which will be

analyzed before Student Scholars Day.

KIRKHOF CENTER GRR 016

The Effect of Atmospheric Conditions on the Rising Incidence of Seasonal Allergies

Participants attending 11:00 AM - 12:00 PM

Presenter: Miranda Fortier

Mentor: Sheldon Kopperl

Each year millions of individuals complain of allergies, blaming the particular season for their misery. Are they correct in their thoughts that each year the season is worsening and if so, what is the reason for this? Researchers have noted that a changing climate may be a contributing factor. This meta-analysis will incorporate findings from several longitudinal studies that have noted changes in weather and changes in allergen producing species to examine if there is a significant correlation between these two factors. Changes in weather were studied by examining numerous factors including temperature, precipitation, and frost season. Allergen producing species were studied by the amount of pollen produced and the length of the pollen producing season. Although there is much speculation on the occurrence of climate change and its impact on allergies, a correlation between these factors could significantly alter the future of health care around the world.

KIRKHOF CENTER GRR 017

Deep Learning for Computational Epidemiology

Participants attending 1:00 PM - 2:00 PM

Presenter: Frank Wanye

Mentor: Gregory Wolffe

Epidemiological simulations predict disease transmission via models that define how simulated individuals (called agents) move and interact. Due to a lack of geo-temporal data, current movement models are overly simplistic; an agent moves only between two locations each day: "Home" and "Not home" (e.g. work or school). Obviously, this model does not accurately reflect reality; individuals typically have varied movement patterns and visit a varying number of distinct locations each day. To address these limitations, we employed a recurrent neural network (RNN), a class of neural network designed to process sequential, time-varying data, to build a more accurate predictive model of agent movements. This poster describes an RNN-based model trained on anonymized mobile phone metadata obtained from the Data for Development (D4D) Challenge in W. Africa. Initial experimental results show our model is highly accurate (79.3%) in predicting the locations of individuals at various times of day.

KIRKHOF CENTER GRR 018

Alpha Synuclein-related MicroRNAs as Biomarkers for Parkinson's Disease

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 4:00 PM - 5:00 PM

Presenter: Brooke Armistead

Mentor: Sok Kean Khoo

Parkinson's disease (PD) is a neurodegenerative disorder that causes impaired motor control. PD is characterized by degeneration of dopaminergic neurons in the midbrain and intraneural accumulation of alpha synuclein (a-Syn) protein. Diagnosis is based on motor symptom development after 50-80% of the dopaminergic neurons are lost. Thus, there is a need to develop measurable and unbiased biomarkers to early detect PD. MicroRNAs (miRs) are small RNA molecules that bind to the 3'UTR of messenger RNA (mRNA) to regulate gene expression. miR-34b/c,

-7, and -153 were previously shown to downregulate α -Syn mRNA and protein expression. Here, we evaluate miR-34b/c, miR-7, and miR-153 as biomarkers for PD by measuring their gene expression in 8 healthy control (HC), 11 newly diagnosed PD, and 18 established PD patients. Results show miR-7 cannot differentiate HC from PD. miR-34b, -34c, and -153 can serve as potential biomarkers for PD diagnosis (p-values=0.01558, 0.0415, <0.0005, respectively).

KIRKHOF CENTER GRR 019

Effect of Music Genre on Muscular Endurance

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenters: Mary Beine, Rachel Bommarito, Cassidy Koviak, Jordan Wagner

Mentor: Amy Gyorkos

Music tempo and preference have been shown to positively impact muscle endurance. The effect of music genre on muscle endurance is still not well known. The primary aim of this study is to observe the influence of various music genres on muscle endurance during resistance training. 6 healthy college-age subjects will be randomized to 4 different music trials to determine the effects on muscular endurance. The music trials will include no music, country, rock, and hip-hop all at the same tempo. The music will be played at the same volume during the exercise session. Music genre preference will be ranked at the end of all trials. Subject's muscular endurance will be measured by a bicep curl and leg curl exercise at 60% 1RM to fatigue. Data collection is currently ongoing.

KIRKHOF CENTER GRR 020

An Inorganic Study of Phosphine Based Compounds

Participants attending 1:00 PM - 2:00 PM

Presenters: Sydney Shavaliar, Anthony Spyker

Mentor: John Bender

This study will incorporate synthetic and analytical approaches to developing and characterizing phosphine based compounds. These compounds will be metalated using silver and platinum in order to form stereo and regio specific complexes.

KIRKHOF CENTER GRR 021

Anti-GnRH Vaccine Affect on Epididymal Function

Participants attending 11:00 AM - 12:00 PM

Presenter: Alexandra Crocenzi

Mentor: Christopher Pearl

The epididymis connects to the testis and is the location of sperm maturation. Epididymal function is dependent on hormones (e.g. GnRH, testosterone) and other testicular factors. This study investigated the effects of an anti-GnRH vaccine on epididymal function in boars. Boars were immunized with the vaccine or left alone, the control group, and then observed ten weeks later. Daily sperm production and serum testosterone were significantly reduced in the vaccine treated boars. Because morphology is closely linked with function we measured the cell height, lumen, and tubule diameter of each epididymal region. Treated boars had a significantly decreased cell height in the efferent duct, caput, and cauda. Tubule and lumen diameter were significantly decreased in the caput, corpus, and cauda regions. Thus, anti-GnRH treated boars had multiple abnormal morphologies which suggests epididymal function, sperm maturation, and overall fertility were suppressed ten weeks following immunization.

KIRKHOF CENTER GRR 022

Calcification of Bursa Discovered in the Anterior Space of the Right Shoulder

Participants attending 9:00 AM - 10:00 AM

Presenter: David Henry

Mentor: Chris Reed

While dissecting the upper limb of the cadaver of a 78-year old female, a large bursal sac was found in the tissue immediately anterior and appreciably inferior to the shoulder joint. Bursa are fluid filled sacs that generally aid movement of joints by acting as a barrier between bones at joints within the body and the soft tissues surrounding the bone articulations, and are composed of various forms of connective tissue. As such, they generally are located alongside articular surfaces, however, they can migrate through acute trauma or continued wear as observed in this individual. In this study, we seek to further describe possible origins of the bursal sac migration and etiology for the calcification of its tissues.

KIRKHOF CENTER GRR 023

The Parent Behind the Potential Farmer

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenter: Claire Efting

Mentor: Brandon Youker

This study explores the experiences of 4-H livestock parents who lack livestock raising experience, yet choose to involve their children in 4-H livestock projects. There are studies that examine the impact of 4-H and livestock on the participating youth; however, there are few about the parents of these participants. This study seeks to discover how these parents supported their children in 4-H and about its impact on the family. Data were gathered through eight semi-structured, face-to-face, audio-recorded interviews with 4-H parents from suburban Detroit and Grand Rapids. The themes from the interview were categorized into three impact areas: friendship, life lessons, and family. Through these themes emerged sub-themes relating to the type of and level of support the parents provided during their children's 4-H years. The parents overall observed their children's involvement in 4-H as a positive aspect in their development and supported them in several ways.

KIRKHOF CENTER GRR 024

Affordably Sustainable: An Innovative Way for Students to Live

Participants attending 3:00 PM - 4:00 PM

Presenter: Conrad Frank

Mentor: Jeroen Wagendorp

Housing for students at Grand Valley State University (GVSU) is viewed as over-priced and does not blend well with the physical environment. In this paper, green infrastructure, affordability, and desirability will be discussed to select components that have the potential to be a successful concept for an apartment complex for the college students attending the university. Scholarly, peer-reviewed articles, an example from Goshen, Indiana, and innovative designs are used for reference to create an alternative by intertwining affordability and sustainability into a housing concept.

KIRKHOF CENTER GRR 025

Reproductive Period of Sugar Gliders in a Captive Breeding Colony

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenters: Alyssa DeWitt, Ashley DeWitt, Kasey Forton
Mentor: Bruce Ostrow

Sugar gliders (*P. breviceps*) are marsupials native to Australia and New Guinea and are seasonal polyestrous mammals that have more than one estrous cycle (heat cycle) lasting 29 days throughout the breeding season and a gestation period lasting 15-17 days (Smith, 1971). The average litter size for a female sugar glider is 2 pouch young (PY) (Assoc. of Sugar Glider Vets). We are maintaining a captive breeding colony of sugar gliders in which we studied their reproductive timing and litter size across a 2 year period. Eight female sugar gliders were anesthetized on a regular basis to check for PY while recording litter size and date discovered. This study showed that sugar gliders in captivity are not seasonal breeders, with an average of 45.5 days between each litter and an average litter size of 1.4 PY, where 49.38% of litters contained only one PY and 50.62% contained two PY.

KIRKHOF CENTER GRR 026

Creating a Representation of Lysozyme Mechanism Using Virtual Reality Technology

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 2:00 PM - 3:00 PM, 4:00 PM - 5:00 PM
Presenter: Brittany Sincox
Mentor: Mary Karpen

Advancements in technology offer new opportunities to close the pedagogical gap in displaying 3D structures using only 2D representations. In subjects such as biochemistry, where we study the structure and function of proteins, 3D representations are essential for student understanding of protein mechanisms. This project focuses on utilizing virtual reality technology to develop a stereoscopic visualization of the lysozyme mechanism. Lysozyme is an antibiotic enzyme, and was one of the first proteins to have its structure determined. This important enzyme is classically taught in introductory biochemistry courses, so creating a useful tool to increase student learning is a valuable addition to the biochemistry curriculum.

KIRKHOF CENTER GRR 027

An Investigation of the Metastatic Patterns of Liver Cancer

Participants attending 9:00 AM - 10:00 AM
Presenter: Brett Talley
Mentors: Chris Reed, Dawn Richiert, Timothy Strickler, Laura Stroik

The dissection of a 55-year-old female cadaver whose cause of death was complications from metastatic liver cancer revealed numerous tumors that had accumulated in the lymph vessels of the axillary and sternal regions. Further dissection of the cadaver will reveal if the liver cancer had spread to other anatomical regions of the body in similar groupings. Previous research has found that there is a pattern of metastasis specific to liver cancer. Dr. Yeu-Tsu, Margaret Lee, MD, and Deborah Geer, MD studied the pattern of primary liver cancer in 43 patients. Their study found that that liver cancer tended to metastasize to specific regions of the body such as the median portal vein, portal lymph node(s), and lungs. The purpose of this investigation is to determine if there is a correlation with the metastatic patterns of the dissected cadaver, and the findings of other published studies.

KIRKHOF CENTER GRR 028

Electronic Structure of Transition Metal Carbenes and Nitrenes in Bis(alkoxide) Ligand Environments

Participants attending 10:00 AM - 11:00 AM
 Presenters: Nicholas Dewey, Eleanor Di Girolamo
 Mentor: Richard Lord

The electronic structure of several transition metal ($M = \text{Cr, Mn, Fe, Co, Ni}$) nitrene/carbene complexes were compared when placed in a bis(alkoxide) ligand environment. These complexes are interesting because there is a question as to where the electrons lie between the metal and the nitrene/carbene ligand, which in turn controls the reactivity of the complex. The lowest energy spin state of each metal was determined using thermochemical analyses. The character of this lowest energy spin state was then evaluated using geometry, Mulliken spin, molecular orbital, and spin density analyses to determine the metal and nitrene/carbene oxidation states.

KIRKHOF CENTER GRR 029

Using ArcMap to Measure Coastal Dune Erosion and Heavy Mineral Introduction Rates Near Lake Michigan

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
 Presenter: Jared Eslick
 Mentor: Peter Wampler

The objective of this study is to use coastal erosion rates and LIDAR data to quantify heavy mineral deposits along the coast of Lake Michigan near Rosy Mounds Natural Area. Historical imagery from google earth and USGS will be used to map historic coastlines. The areal extent of erosion, determined from coastal erosion mapping, will be combined with the LIDAR data to assess the volume of sand that is being eroded from the coast. Heavy minerals percentages in dune sands, derived from literature, will be combined with the volume information to determine the amount of heavy minerals that are being contributed to various sections of the Lake Michigan coast. Additionally, sand samples will be taken from the Rosy Mounds coastal area to test for heavy mineral content using simple density differences of the minerals.

KIRKHOF CENTER GRR 030

“Can You Tell If I’m Zapping Your Brain?” An Analysis of Blinding Effectiveness During tDCS

Participants attending 12:00 PM - 1:00 PM
 Presenter: Dorie Sullivan
 Mentor: Benjamin Swets

Transcranial direct current stimulation (tDCS) is a brain stimulation technique in which electrodes deliver low doses of electricity to the brain. tDCS has been found to enhance cognitive performance in many domains, including speech. However, previous research has posited that many positive tDCS findings may be placebo effects due to faulty blinding procedures (O’Connell et al., 2012). The current study explores the effectiveness of a double-blind tDCS procedure at a 2 mA dosage, in addition to examining sensations reported by participants. Participants were randomly assigned to receive stimulation or a sham condition. Afterwards, participants completed a questionnaire about the sensations they experienced and which condition they believed they were in. This is the first step of a larger study in which we are investigating the impact of tDCS on sentence planning. The results of this analysis will help determine whether that study’s participants are sufficiently blinded.

KIRKHOF CENTER GRR 031

The Effect of Black Raspberries (*Rubus occidentalis*) on Oral and Esophageal Malignancies

Participants attending 3:00 PM - 4:00 PM

Presenters: Allysen Dubisky, Alyssa Schutzenhofer

Mentor: Amy McFarland

Oral and esophageal cancer are the 6th and 8th most common cancers worldwide, respectively. The current treatment methods lack effectiveness and often result in harmful side effects, thus it is pertinent to explore other methods of treatment. There has been a great deal of research published on the ability of black raspberries to potentially reverse premalignant cell growth in oral and esophageal cancer. Research on the historical use of food as medicine as well as the function of black raspberries and their ability to attack cancer cells was collected from primary and secondary sources. Treatment with black raspberries in a variety of forms has revealed their potential as an anticancer agent. This is due to anti-oxidative, anti-inflammatory, and anti-proliferative properties, as well as the ability to reactivate tumor suppressor genes. These results indicate that use of black raspberries in medicinal practices could provide effective oral and esophageal cancer treatment.

KIRKHOF CENTER GRR 032

Using ArcGIS to Analyze the Effects of Groundwater Pumping on Groundwater and Surface Water near Evart Michigan

Participants attending 11:00 AM - 12:00 PM

Presenter: Robert Allor

Mentor: Peter Wampler

Groundwater pumping and bottling by Ice Mountain, Inc. near Evart, Michigan has been a controversial issue due to the potential for both economic and environmental problems. There is an ongoing debate about whether the groundwater pumping is sustainable without adverse effects to the groundwater and surface water resources. The objective of this study is to use available well, groundwater, and surface water data to map and evaluate the effects of the pumping to determine whether there are measurable adverse effects. ArcMAP GIS will be used to show potential alterations in the rate and direction of groundwater flow, changes in the water table, and any effects to the surface water discharge in local watersheds. Well data will be obtained from GeoWebface, a public access government database, maintained by the Department of Environmental Quality, of wells in Michigan. Surface flow data will be obtained from nearby gaging stations to evaluate changes in surface water flow.

KIRKHOF CENTER GRR 033

Homeless of Grand Rapids

Participants attending 11:00 AM - 12:00 PM

Presenter: Morgan Plue

Mentors: Lori Houghton-Rahrig PhD RN, Susan Strouse

Over 550,000 people are homeless in the U.S. The homeless have a higher prevalence of mental illness, alcoholism, and drug abuse than the general population. Over 60 agencies providing resources are available to the homeless in the West Michigan (MI) area, but it is unclear if the homeless experience substance abuse and/or mental illness, what additional experiences influence their lives, and if the homeless are aware of available resources. Twenty-nine adults were recruited from a homeless shelter in West MI and interviewed in this mixed

methods phenomenology study. A modified Giorgi approach was used to analyze the qualitative data. SPSS 24 was used to generate descriptive statistics and chi-square results. Structured interview questions provided insight on their daily struggles as a part of the homeless population having a mental illness and/or a substance abuse problem, feedback about resources in West MI, what problems they experience, and what other resources are needed.

KIRKHOF CENTER GRR 034

Syria: Ethnic, Religious, and Tribal Borders in a Postwar Scenario

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM

Presenter: Gary Farris

Mentor: Elena Lioubimtseva

This study seeks to understand what a new Syria might look like after the current hostilities have ceased. As human geography, migration, and settlement are often influenced by war and strife, it is important to understand how these factors can shape new borders, and to what extent ethnicity, religion, and tribalism play a part in this shaping. Using recent precedents in Balkanization, such as Yugoslavia, and Sudan, this study will attempt to determine what terminal conditions must be reached before a nation is calved from an existing one. Using scholarly works and existing data, the demographics of Syria will be determined, spatial relationships between geographic areas, ethnicities, religious hearths, and various tribes will be studied, and group marginalization, power, and vulnerability will be assessed. A hypothetical map of Syria will be produced with ArcGIS to reflect this Balkanization scenario.

KIRKHOF CENTER GRR 035

What do Prisons Have to Do with Reproductive Rights?

Participants attending 12:00 PM - 1:00 PM

Presenter: Carianne Okopski

Mentors: Julia Mason, Leifa Mayers

The rights of incarcerated women's reproductive care are rooted in the Eighth Amendment's forbidding of "cruel and unusual punishments." However, in practice, many lack basic access to their rights and bodily autonomy. This project aims to expand knowledge of women's reproductive rights through an examination of the class action lawsuit *Smelbauer v. Muskegon Cty.* This case challenges the unconstitutional and inhumane conditions of confinement within the jail through the testimonies of the plaintiffs, six former inmates of Muskegon County Jail (Michigan). I will employ an intersectional framework to gain a deeper understanding of why certain experiences are excluded in the discussion, which allows feminist researchers to investigate the ways race, gender, class, and sexuality interact to continually oppress individuals and minority groups. The shocking narratives of these women will provide a better understanding of their experiences and why their rights are important.

KIRKHOF CENTER GRR 036

Getting Hot in the Tropics: Linking Vertical Position of Eight Epiphytic Ferns with Their Thermal Profiles

Participants attending 9:00 AM - 10:00 AM

Presenter: Joshua Stayman

Mentor: Gary Greer

Elaphoglossum is a dominant epiphytic genus in Puerto Rican wet forests. I investigated whether species within this

genus have anatomically specialized to different conditions along the vertical gradient of a tree, particularly within the first three meters; i.e., warmer, drier conditions higher up versus cooler, wetter, shadier conditions lower down. I did so by comparing their thermal profiles to their gross anatomy and prevailing vertical position. These species differ in leaf size, shape, and thickness and these differences are expected to affect rates of heating and water loss. I analyzed thermal images taken in the wild, correcting for differences in air temperature, humidity, and light-levels. As expected, large-wide leaves had higher mean temperatures and larger gradients from center to margin than their smaller-narrower counterparts, which corresponded with their locations low versus higher on a tree.

KIRKHOF CENTER GRR 037

This Science Doesn't Make Sense: Reading Behaviors After Encountering Inconsistencies Within Scientific Explanations

Participants attending 10:00 AM - 11:00 AM

Presenter: Carli Younggren

Mentor: Brent Steffens

Learning in science requires students to build a complete and coherent mental model for a text. However, students struggle to remember the events of scientific explanations (Rupp et al., 2015). Readers may struggle because they fail to link events and establish coherence between them while reading. In addition, they may not notice gaps in their understanding because automatic processes repair these coherence breaks (Otero & Kintsch, 1992). The current study examined whether readers detect coherence breaks between events of a scientific explanation. Students read explanations about different scientific phenomena. These explanations did or did not contain events that were inconsistent (e.g., The movement of the wing muscles *warms/cool*s the surrounding air and the honey cell. Therefore, the *heated* water inside the cell evaporates). Eye-movements were recorded during reading. After, participants completed a cued recall and detection questions. Data collection for this study is currently ongoing.

KIRKHOF CENTER GRR 038

The Blessings of Liberty? Freedom in Contemporary Political Discourse

Participants attending 1:00 PM - 2:00 PM

Presenter: Audrey Fox

Mentor: David Crane

The 2016 election cycle showcased seemingly irreconcilable disparity between the two political parties. This disparity continues to be fueled by a widening socioeconomic gap and impediments to movements that advance the causes of marginalized groups. Popular media platforms (e.g. *The Washington Post* and *The New Yorker*) have featured op-eds addressing these issues, written by public intellectuals such as Danielle Allen and Andrew Sullivan. Their writings invoke the philosophies of Richard Rorty, Hannah Arendt, and Plato in order to diagnose the causes of our political turbulence, as well as offer potential solutions to this turmoil. This project evaluates the validity of these allusions, as well as the applicability of the philosophical theories of democracy. It does so by developing an account of freedom in dialogue with these theories that is necessary for explaining what is at stake in the ideological conflict plaguing this country.

KIRKHOF CENTER GRR 039

Queer Women, Polyamory, and Mainstream Media

Participants attending 11:00 AM - 12:00 PM

Presenter: Ty Konell

Mentors: Danielle DeMuth, Julia Mason, Leifa Mayers

Polyamorous queer women's voices are often left out of relationship research. This project analyzes contemporary mainstream representations of polyamorous relationships through an analysis of the Showtime series "Polyamory: Married and Dating" (2012-2013) and the TLC series "Sister Wives" (2010-present). Focusing on the relationships depicted in the programs, I will examine the representation of lesbians and queer women in these shows. The significance of this research is in uncovering media portrayals of polyamorous relationships involving more than one woman, giving a voice to an often unheard and under-represented community. This research will produce knowledge that illustrates how mainstream media and society regard queer women in non-traditional relationship structures.

KIRKHOF CENTER GRR 040

Embedding Tissue in Agar for Vibratome Sectioning

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenter: Cory Kelley

Mentor: Chris Reed

This study aims to establish a protocol for embedding tissue in order to section with a vibratome. We have established an effective technique for embedding tissue in agarose for vibratome sectioning. Tissue can be embedded in agarose without dehydration and rehydration. However, the agarose must be dense enough to hold the tissue in position and maintain its integrity during sectioning. In order to determine the appropriate density, we produced solutions of agarose at specific concentrations and chilled at different temperatures to determine the appropriate means for embedding tissue. This is critical for sectioning with a vibratome, an instrument that precisely sections fixed or fresh tissue samples using a blade that vibrates at a high frequency. Samples were sectioned on the vibratome at multiple thicknesses in an attempt to identify the ideal concentration and methodology of tissue embedding to achieve an optimal section of tissue.

KIRKHOF CENTER GRR 041

Identifying the Genes Involved in *Staphylococcus lugdunensis* Metal Homeostasis

Participants attending 11:00 AM - 12:00 PM

Presenters: Jonathan Galea, Zachary Wietecha

Mentor: Kathryn Haley

Staphylococcus lugdunensis is part of the skin flora but has potential to cause infections. The process by which *S.lug* transitions to an invasive pathogen remains unclear. During infection, the host sequesters metal from pathogens in a process called nutritional immunity. To circumvent this, bacteria have evolved a wide range of strategies to facilitate acquisition of metals, producing metal chelating proteins and bombarding bacteria with toxic levels of metal. In response, bacteria have evolved to overcome metal deprivation and toxicity. Due to their unique inorganic properties, metals serve as cofactors for enzymes for bacterial survival. Our research identifies the concentrations of Cu^{2+} , Zn^{2+} , Mn^{2+} , and heme *S.lug* experiences toxicity so that we can screen for genes involved in metal homeostasis using a transposon mutant library. Understanding the mechanism by which *S.lug* maintains metal homeostasis and how this changes within human infection is vital to proper treatment.

KIRKHOF CENTER GRR 042

Mouthing Off: Stomatal and Associated Leaf Anatomy as Determinants of Trunk Position

Among Epiphytic Fern Genus, *Elaphoglossum*?

Participants attending 10:00 AM - 11:00 AM

Presenter: Hannah Hodges

Mentor: Gary Greer

Stomates are microscopic pores in leaves that open to allow in carbon-dioxide for photosynthesis. In doing so, they also release water vapor creating water flow (via negative pressure) through vascular tissues from the roots. As a result, stomates are critical to a plant's control of its water status. The purpose of this study was to determine if an association exists between the stomatal traits of seven species of the fern genus *Elaphoglossum* and their vertical stratification on host trees in Puerto Rican forests. I photographed the epidermis of each species as well as cross-sections of their leaves and measured a number of anatomical traits (e.g., guard cell size & frequency, mesophyll cell size & air spaces, & vein density). I then conducted univariate correlations and a principle component analysis to answer the question. Remarkably, my results revealed key traits associated with prevailing vertical occurrence within the bottom three meters of a host tree.

KIRKHOF CENTER GRR 043

Does the Invasive Tree-of-Heaven (*Ailanthus altissima*) Impact Native Plant Species Biodiversity In Michigan?

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenter: Renee Tardani

Mentors: Timothy Evans, Gary Greer

The tree of heaven (*Ailanthus altissima*) is an American invasive plant species from Southeast Asia that has spread along human disturbance since its introduction in the late 1700's as an ornamental. Reproducing prolifically since its escape, the relationship between this invasive species and the native flora of the United States, including Michigan, is not well-understood. I investigated the impact of *A. altissima* on understory plant diversity at Yankee Springs Recreation Area (Allegan Co) using a paired-plot (*Ailanthus* vs. Native Tree) survey. All species within 20 1m x 1m plots below each tree group (*Ailanthus* vs. Native) were identified and counted. I then used both univariate and multivariate analyses to tease apart differences in understory composition between *A. altissima* and native trees. My results reveal impacts on understory composition that may have food web and successional ramifications.

KIRKHOF CENTER GRR 044

Olfactory Alarm Signaling in Crayfish

Participants attending 10:00 AM - 11:00 AM, 12:00 PM - 1:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM

Presenters: Gregory Deemer, Caitlin McHugh, Lindsey Short

Mentors: Daniel Bergman, Samantha MacKay

Chemical signaling among freshwater animals has been studied to provide insight into the functions of complex predator-prey relationships. A subset of chemical signaling systems is the alarm pheromone, which is typically released when an animal feels threatened or has been injured. Crayfish are an integral part of the freshwater food web and utilize chemical communication in many capacities ranging from aggression to reproduction. Crayfish are also hypothesized to release alarm chemicals which elicit a fear response in other crayfish. Our study compared the behavioral responses of male *Orconectes propinquus* crayfish using two odorants: a crushed conspecific male crayfish and food. We hypothesize that subjects are repelled by the crushed conspecific male crayfish due to the presence of an alarm pheromone odor, whereas food odorants will be attractive. Furthermore, it is expected that

crayfish will prefer neutral territory in the maze or spend more time in the non-odor arm.

KIRKHOF CENTER GRR 045

Amplification of the Effects of Climate Change in the Aquatic Ecosystem of Northwestern Australia

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenters: Collin Freeman, Vashti Gregory, Jordyn Wilson

Mentor: Elena Lioubimtseva

Global environmental change is impacting the aquatic ecosystems in a multitude of ways. To demonstrate these impacts we examined the relationships of various predators and prey to determine the bottom-up changes in the dynamic food web of northwest Australia. Using climate change modeling and further studies, we analyzed the relationships between coral bleaching, tropical fish speciation, and reef shark viability to determine if the impacts caused by climate change are amplified by forcings in the lower levels. Mass coral bleaching and reduced counts of reef fishes were directly correlated with climate change in a wide variety of locations by multiple external studies. A decline in the fitness of reef sharks was documented but it was unclear whether it was caused by the change in environment, human interaction, or by the reduction of prey. The bottom-up model of effect in the aquatic ecosystem was clearly documented and it showed strongest effect when multiple stressors were present.

KIRKHOF CENTER GRR 046

Life and Death of the Great Barrier Reef

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 4:00 PM - 5:00 PM

Presenters: Zakkaria Hales, Andi Kares, Mitchell Plichta, Sierra Rancour

Mentor: Elena Lioubimtseva

The main focus of our project is to educate people about the life and death of the Great Barrier Reef. This death has been the result of large scale coral bleaching. When water is too warm, corals will expel the algae (zooxanthellae) living in their tissues causing the coral to turn completely white, known as coral bleaching. Bleaching does not mean that the coral is dead, however it is more vulnerable to disease and other threats. If the coral does die, the reef will also die and erode, destroying the most important of marine ecosystems. Coral reef ecosystems cover <1% of the world's ocean area yet are home to about 25% of marine species. Coral ecosystems are a source of food for millions; protect coastlines from storms and erosion; provide habitat, spawning and nursery grounds for economically important fish species; provide jobs and income to local economies from fishing, recreation, and tourism; are a source of new medicines; and are hotspots of marine biodiversity.

KIRKHOF CENTER GRR 047

Analyzing the Effects of Asteroids on the LISA Spacecrafts

Participants attending 11:00 AM - 12:00 PM

Presenter: David Bronicki

Mentor: Brett Bolen

The Laser Interferometer Space Antenna (LISA) is a proposed European Space Agency (ESA) mission to measure gravitational waves. It is composed of three spacecrafts which maintain a roughly triangular formation in orbit around the sun. Laser interferometry allows for the distance between any two spacecrafts to be monitored with

extreme accuracy. However, this precision means the system will be sensitive to other gravitational sources within the solar system. In this project, we numerically simulate how the asteroids in the solar system will perturb the spacecrafts' orbits. The asteroids' orbital parameters and properties were obtained from the Jet Propulsion Laboratory Small-Body Database. If unavailable, properties were modeled via the Monte Carlo Method. With this, it becomes simple to calculate what gravitational force any asteroid will apply on the LISA spacecrafts. By running the simulation several times, we can model the noise produced by the asteroid perturbations.

KIRKHOF CENTER GRR 048

An Unusual Origin of the Latissimus Dorsi Muscle

Participants attending 11:00 AM - 12:00 PM

Presenter: Colin Pellegrom

Mentors: Chris Reed, Dawn Richiert, Timothy Strickler, Laura Stroik

A prominent, bilateral origin of the latissimus dorsi muscle was uncovered in the dissection of an 84 year old male cadaver. The muscle, which adducts the arm, typically originates on the spinous processes of T7-L5 vertebra, thoracolumbar fascia, iliac crest, and inferior ribs. In this instance, part of the muscle originates on the inferior angle of the scapula as well. The muscle is innervated by the thoracodorsal (middle subscapular) nerve, and supplied by the thoracodorsal artery. Other notable variations of the latissimus dorsi muscle include axillary arches, where some muscle fibers extend around the arm and insert into the humerus. This study will delve into the possible explanations for this prominent muscular origin and address the effect it has on the action of the muscle.

KIRKHOF CENTER GRR 049

Community in Queer Activist Spaces

Participants attending 1:00 PM - 2:00 PM

Presenter: Brianna Bost

Mentors: Julia Mason, Leifa Mayers

For participants in queer activism, community is vitally important because the increase in number of participants often is correlated to an increase in both safety and recognition. This project analyzes relationships and bonds that are formed in queer activist spaces, in order to understand how identities impact the formation of differing dynamics between people. The methodology is intersectionality, because a large aspect of this project has to do with the ways identities impact how people form community in queer activist spaces. I am examining primary sources from a database of ephemera on queer activist spaces from 1985 to 2000 that were collected in both the Lesbian Herstory Archives and ACT UP archives. These primary sources include meeting minutes and intragroup communication that reveal people's motivations for joining the organizations they did. There is a lack of analysis about queer people in non-romantic and non-sexual relationships, and I am hoping to help fill this gap.

KIRKHOF CENTER GRR 050

Investigation Into the Cellular Processes of the GAP-43 Protein and Association with Learning and Memory in Alzheimer's Disease

Participants attending 12:00 PM - 1:00 PM

Presenter: Paige Matusiak

Mentor: John Capodilupo

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by cognitive and behavioral impairment.

As the severity of AD intensifies, one may entirely lose the capacity to function independently. Past efforts to identify underlying mechanisms of AD pathogenesis have largely focused on investigating the role of β -Amyloid plaques and neurofibrillary tangles. As a result, additional primary pathogenic factors of AD, such as neuronal death and synaptic dysfunction, have been overlooked in research. GAP-43, a growth associated protein widely expressed in neurons, appears to play an important role in neuronal branching and pathfinding during the development and regeneration of one's neural network. GAP-43 has been shown to positively influence presynaptic changes, such that neurotransmitter release is enhanced and spatial memory formation and learning are facilitated. We believe restoration of normal neuronal synaptic activity in AD must be included while searching for its cure.

KIRKHOF CENTER GRR 051

Unilateral High Bifurcation of the Radial Artery and Ulnar Artery from the Brachial Artery

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenter: Kevin Hughes

Mentors: Chris Reed, Dawn Richiert, Timothy Strickler, Laura Stroik

The brachial artery typically divides into the radial artery and ulnar artery at the antebrachial fossa. However, in some instances, the bifurcation of the brachial occurs at a more proximal location in the arm. The dissection of a 74 year old male cadaver revealed a significantly high bifurcation only on the right arm at the level of the head of the humerus. As such, this cadaver lacks a right brachial artery as the bifurcation occurs at the 3rd part of the axillary artery. This project will discuss the effects and implications, if any, such a high bifurcation has on the patterning of important distal vasculature compared to what is considered to be the anatomical norm. We will also discuss and propose potential explanations for what could cause this anatomical variant.

KIRKHOF CENTER GRR 052

Cold-tolerance and Survival of an Invasive Crayfish Species, *Procambarus clarkii*, in Michigan Aquatic Environments

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenter: Dominic Petriella

Mentor: Daniel Bergman

The crayfish species *Procambarus clarkii* is known for rapid reproduction and resistance to both hypoxia and dehydration, all of which allow them to inhabit diverse aquatic habitats. Therefore they can drastically disrupt aquatic biodiversity in aquatic systems. Fortunately *P. clarkii* does not typically inhabit northern climate zones. Yet with the changing global climate, this species could threaten biodiversity in northern ecosystems. It is unknown if *P. clarkii* can tolerate extended periods of frigid northern water temperatures. Simulation of a Michigan winter via aquatic refrigeration and limiting of food availability, we compared the survival of *P. clarkii* to native crayfish, *Orconectes propinquus*. Results indicate significant declines in activity and survival of *P. clarkii* when compared to the native species. Cold tolerance measurements can provide insight into the likelihood of a long-term *P. clarkii* invasion in Michigan, something with which the DNR is currently concerned.

KIRKHOF CENTER GRR 053

Synthesis and Characterization of Phosphine Chalcogenide Ligands

Participants attending 2:00 PM - 3:00 PM

Presenters: Joshua Ojeda-Retamal, Ali Salame

Mentor: John Bender

1,1-Bis(diphenylphosphino)methane (dppm) was used to prepare the monoselenide (dppm-Se), which was further derivatized to produce the selenide/sulfide (dppm-Se/S) and selenide/oxide (Se/O) compounds. These were characterized, with the dppm-Se/S and dppm-Se also being examined for stability as ligands in metal complexes.

KIRKHOF CENTER GRR 054

Identification and Characterization of *Candida albicans* Filamentation Mutants

Participants attending 10:00 AM - 11:00 AM

Presenter: Alexis Bigler

Mentor: Derek Thomas

Candida albicans is a fungal commensal organism that is found on mucous membranes and in the digestive tract. *Candida albicans* is also an opportunistic pathogen that has the capability to invade human hosts that are immunocompromised. This organism can take many forms and is frequently found in either a yeast or a filamentous form. Filaments can be either pseudohyphae or true hyphae, with the ability to form the latter in host tissues appearing to be a virulence trait that contributes to the overall pathogenicity of the organism. We previously identified a subset of proteins that appeared to be involved in the transition from yeast cells to the filamentous form. Here we characterize the impact of overexpression of such proteins on the ability to filament under various conditions and on the ability to cause disease in the *Galleria mellonella* model. We demonstrate a dramatic effect on filamentation and attenuation of disease.

KIRKHOF CENTER GRR 055

Chipper Research Study

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 3:00 PM - 4:00 PM

Presenters: Olivia Dubay, Kayla Hey

Mentor: Amanda Dillard

In this study, we examined whether suspense and identification would moderate narrative transportation, decision making and behavior intentions for light/social smokers. College students that responded “yes” to smoking on a preliminary questionnaire were asked to read either a first-person narrative about a college student who was a light smoker and was experiencing some minor health issues, or a fact sheet about the risks of smoking. In the narrative, the student either identified or did not identify as a smoker, and the narrative either ended with high or low suspense. After reading the narrative, participants answered questions assessing narrative transportation, risk perception, and behavior intentions. We examined whether or not participants had an increase in narrative transportation and a higher behavioral intention to quit smoking if they identified with the student in the narrative, and if the narrative ended in suspense.

KIRKHOF CENTER GRR 056

Toward Creating a Canine Crash Test Dummy: Morphometric Measurements and Center of Mass of Various Sized Canines

Participants attending 4:00 PM - 5:00 PM

Presenter: Kimberly Suran

Mentor: Benjamin Holder

Today more and more people are traveling with their dogs, thus increasing the amount that are involved in car crashes. With no standard regulations on harnesses or methods for securing the dog in the vehicle, “Man’s Best

Friend” is in a unique position of danger. This project focused on the first steps toward creating standard regulations on harnesses, namely obtaining morphometric measurements of dogs and estimating their center of mass. We took external measurements of various breeds and sizes, ranging from 10-85 lbs, and compiled a database of these dimensions. We calculated the center of mass of each dog in multiple postures including sitting, standing, and laying down. Data from CT scans were considered to eliminate the initial assumption of uniform density. We hope that the results of this preliminary investigation will allow for the construction of an accurate model that will be used in later crash testing and lead to the implementation of standard regulations for dog harnesses.

KIRKHOF CENTER GRR 057

Social Science: Issues in Undergraduate Enrollment

Participants attending 9:00 AM - 10:00 AM, 3:00 PM - 4:00 PM

Presenter: Andra Durham

Mentor: Tara Hefferan

As STEM fields continue to grow across the United States, social sciences, including anthropology, have begun seeing a downward shift in the number of undergraduate enrollments. This is also true at GVSU, where the Fall 2017 ANT420 class wanted to know why it is, in an age when anthropology thrives in its ability to bridge the cultural distance in an ever more subtly connected global society, than student enrollment has begun to decrease. To answer this, a study was designed and conducted over eight weeks by the ANT420 students, gathering perspectives on the field of anthropology and individual enrollment choices of non-majors and majors alike through a questionnaire and focus groups, as well as those of the anthropology faculty, to gain insight and suggest solutions. Findings suggest the field itself is misunderstood by students and that enrollment would benefit from more visibility and cross-departmental engagement to focus on the interdisciplinarity of anthropology.

KIRKHOF CENTER GRR 058

Drag Queens on the Small Screen

Participants attending 11:00 AM - 12:00 PM

Presenter: Rebecca Rogers

Mentors: Julia Mason, Leifa Mayers

The experiences of drag queens are filled with instances of oppression; however, the ways in which this occurs are often dependent upon the societal perceptions of the drag community. This research is an in-depth textual analysis of the reality TV show, *RuPaul's Drag Race*, which highlights the influence that society and media has had on the experiences of drag queens. While research in the past has focused on the representation of drag queens in *RuPaul's Drag Race*, there has been a noticeable absence of research focusing on the unique experiences of the queens of color on the show. While all drag queens experience oppression, the drag queens of color experience oppression differently. It is essential to analyze the representation of queens of color in order to understand the drag community as a whole. An intersectional framework allows for a deeper understanding of popular representations of drag queens of color.

KIRKHOF CENTER GRR 059

Pornography and Female Sexuality

Participants attending 1:00 PM - 2:00 PM

Presenter: Rebecca Rogers

Mentor: Karen Zivi

The pornography industry has always been a controversial issue within feminist academic circles. Since the 1980's, there has been two different groups of feminist viewpoints on porn. One group of feminists view porn as harmful to women, while the other section of feminists support porn as a potential source to embrace female sexual agency and reject the traditional patriarchal suppression of female sexuality. It is necessary to analyze the ways in which the feminist discourse surrounding porn itself has gone on to influence societal perceptions of female sexuality. This analysis will allow for a deeper understanding of the numerous societal factors that influence female sexuality. This will then potentially allow for women to fully reject these traditional sexual norms.

KIRKHOF CENTER GRR 060

Microsatellite Genotyping of Grey Bats (*Myotis grisescens*)

Participants attending 10:00 AM - 11:00 AM, 2:00 PM - 3:00 PM

Presenter: Andrea Baxter

Mentor: Amy Russell

Bat populations have suffered major declines in the past 10 years due to increased cave commercialization as well as the emergence of the fungal pathogen *Pseudogymnoascus destructans* (*Pd*). The grey bat (*Myotis grisescens*) has been listed as endangered since 1975 by the U.S. Fish and Wildlife Service due to decreasing habitat from commercialization and the flooding of caves from artificial reservoirs, and has recently been documented as a host of *Pd*. By looking at allelic frequencies in a sample population, we can survey the diversity of the species. Fifteen microsatellite loci were genotyped in a sample population of *M. grisescens*. We will test these data for Hardy-Weinberg equilibrium, and evaluate patterns of population structure in the sample. The analyses will contribute to further research in assessing population health of grey bats in the United States.

KIRKHOF CENTER GRR 061

A Comparison of Factors Used to Measure Lean Quality Improvement Initiative Pervasiveness in Healthcare

Participants attending 10:00 AM - 11:00 AM

Presenter: Jidnyasa Mantri

Mentors: Gregory Schymik, Guenter Tusch

Since the 1980s formalized methodologies for increasing quality and efficiency such as Total Quality Management (TQM), Six Sigma, Lean, and ISO 9001 have proven successful in reducing costs, increasing production, and improving quality. Healthcare is a natural candidate for the application of the systematic, data driven techniques defined by those philosophies. This poster presents the results of a literature review of the relationship between quality management practices and their effects on healthcare outcomes. It summarizes factors used in manufacturing and healthcare to measure the depth, or embeddedness, of these quality improvement initiatives in the culture of the organizations. It proposes a research model with five critical success factors as independent variables and healthcare outcomes impacted by the critical success factors as dependent variables. Our intention is to use the model to examine the impact quality improvement initiatives have on healthcare outcomes.

KIRKHOF CENTER GRR 062

Effects of Exposure to an Insecticide on Crayfish Locomotion and Food Odor Orientation

Participants attending 12:00 PM - 1:00 PM

Presenters: Melaina Bent, Miranda Debellis

Mentors: Daniel Bergman, Samantha MacKay

Carbaryl is a common insecticide that acts as an acetylcholinesterase inhibitor. It does not typically endure in the environment and is detoxified rapidly in vertebrates. While carbaryl eradicates intended targeted insects, it also can kill beneficial insects and crustaceans as well. We hypothesize that carbaryl at sublethal levels will be detrimental to crayfish orientation behavior. Crayfish were divided into three exposure groups, either a low concentration (0.25 µg/L), high concentration (0.75 µg/L), or a no exposure control. Crayfish are exposed for 48 hours and then tested for their ability to locate a food source in a y-maze. Crayfish exposed to carbaryl will likely demonstrate dose dependent changes in their ability to find food relative to the control group. A reduced ability to find food would suggest that exposure to carbaryl impacts their olfactory detection capabilities, which could lead to nutritional deficiencies.

KIRKHOF CENTER GRR 063

Changes in Vegetation Cover Across the Landscape Over Time in Northern Alaska

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenter: Jacob Harris

Mentor: Robert Hollister

This research presents changes in the plant canopy cover at both Atkasuk and Utqiagvik, Alaska. At each location 30 plots distributed equally across the landscape were sampled annually, via a point-frame method, from 2010 to 2017. Plants were identified to species and classified into 6 functional groups (bryophytes, deciduous shrubs, evergreen shrubs, forbs, graminoids, lichens). There were significant changes in cover between years. Both graminoids and deciduous shrubs increased at Atkasuk and to a lesser degree at Utqiagvik. We compared the changes in cover with the following abiotic factors: average air temperature in June, total precipitation in June, average number of thawing degree days, soil temperature, soil moisture, and active layer depth. Correlations between cover values and abiotic factors differed by growth form and differed by site. The strongest correlations suggest that changes in graminoid and deciduous shrub cover are being driven by temperature dynamics.

KIRKHOF CENTER GRR 064

Examining Plant Traits as Drivers of Vegetation Change in Tundra Communities

Participants attending 12:00 PM - 1:00 PM, 3:00 PM - 4:00 PM

Presenter: Katlyn Betway

Mentor: Robert Hollister

The Arctic is experiencing significant warming. To understand the impacts of warming on tundra we present the results of over 20 years of experimental warming at Utqiagvik, Alaska. Vegetation was sampled using the point frame method. We found significant changes in cover over time. We looked to see if the traits of the species in the communities could be used to predict the observed change in cover. To do this, plant height, leaf carbon content, leaf nitrogen content, leaf phosphorous content, C:N ratio, leaf dry matter content, dry seed mass, and specific leaf area were correlated with cover change at the site. We found that plant height, leaf carbon content, and dry seed mass showed significant correlations with change in cover. These findings are increasing our understanding of vegetation dynamics and will ultimately be used to better predict future vegetation change.

KIRKHOF CENTER GRR 065

Biofilm Formation of *Escherichia coli* Under Varying Oxygen Conditions

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM

Presenter: Karmen Rucker

Mentor: M. Aaron Baxter

Escherichia coli is a commensal microorganism that colonizes the colon of humans, providing vitamin K, aiding in the breakdown of food, and preventing colonization by pathogenic bacteria. To establish itself in the colon, *E. coli* uses a biofilm, a prokaryotic structure that enhances colonization, resistance, and the metabolic capability of the organisms. Often, to form complex biological structures, bacteria monitor environmental signals to determine when genes for that structure need to be activated. It is our hypothesis that biofilm formation in *E. coli* relies on the lack of oxygen, typically seen in the colon, as a signal to increase biofilm synthesis. To test this hypothesis, we are creating a library of *E. coli* mutants via transposon mutagenesis, and testing biofilm levels in aerobic, microaerophilic and eventually anaerobic conditions. Upon identification of a mutant that affects biofilm levels, the gene can be evaluated for its role in biofilm formation in response to oxygen.

KIRKHOF CENTER GRR 066

Effects of Pre-Cooling on Aerobic Performance

Participants attending 9:00 AM - 10:00 AM

Presenters: Alexandra Brinkman, David Ippel, Madison Reid, Jennifer Stone

Mentor: Kyle Barnes

Exercise performance is negatively affected in hot environments. Pre-cooling is a technique to reduce body core temperature prior to exercise to enhance performance. The purpose of this study is to determine the effectiveness of pre-cooling during warm-up on aerobic performance in individuals participating in the Bruce Protocol in a hot environment. Nine active college-aged individuals (4 Females, 5 Males) completed the Bruce Protocol to exhaustion on two separate occasions in a randomized crossover design. In the control condition the warm up consisted of 10-min on a cycle ergometer at 50 RPM and 1 kg resistance. In the experimental condition subjects performed the same warm-up while their hands were submerged in ice water (53 ± 3) and they were wearing a neck cooling collar. Both testing sessions were conducted in a hot environment (80 ± 3). Data collection is currently underway, and results will be presented at Student Scholars Day.

KIRKHOF CENTER GRR 067

Hypertrophic Effects of Blood-Flow Restriction Training With the Recreationally Active

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM

Presenters: Ashlin Aiken, Michael Degenhardt, Wendy Hoogstra, Zachary Mellerowicz

Mentor: Ross Sherman

A goal of exercise is to promote muscle adaptation resulting in growth. Blood flow restriction (BFR) training has shown to improve muscle performance by increasing the muscular metabolic stress with lower resistance. The aim of this study is to determine differences between non-BFR and BFR training on leg strength and size at 40% 1-repetition maximum (1-RM). Active college-aged individuals will participate and be divided into two independent groups (non-BFR [control] & BFR). The BFR will be standardized in location and degree of occlusion. Prior to and following the training program, measurements of 1-RM leg press, resting blood lactate levels, limb circumference, and quadriceps skinfold will be taken. Over a 4-week period, both groups will participate twice weekly in a standardized warm-up and 3 sets of 10 repetitions at 40% 1-RM. Data will be presented at SSD.

KIRKHOF CENTER GRR 068

An Assessment of the Synergism Between Vegetation Cover Change and Remote-Sensing, Hyperspectral Data at Utqiagvik, AK

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 4:00 PM - 5:00 PM

Presenter: Hana Christoffersen

Mentor: Robert Hollister

Accelerated global warming is affecting vegetative growth and reproduction. Arctic vegetation is especially susceptible to climatic shift. In a long-term warming experiment in Utqiagvik, AK, vegetation cover was sampled via a point intercept method from 1995 to 2016 across 48, one-square meter plots. Recent remote-sensing data has provided additional metrics for assessing landscape-level vegetation changes. The change in plant cover was mapped alongside hyperspectral data in ArcGIS, revealing possible patterns of spatial clumping across the research site. Analysis of the change in graminoid, lichen cover, and hyperspectral data revealed correlations between plant cover, aspect, elevation, and wetness indices. Graminoids and lichens show a response to existing biomass, NDVI, and MSI indices. These findings suggest that remote sensed data can help understand the complexities of changing vegetation in response to climate change.

KIRKHOF CENTER GRR 069

Dental Home

Participants attending 9:00 AM - 10:00 AM, 4:00 PM - 5:00 PM

Presenters: Christina Elsholz, Rebecca Oppman, Nicole Zolynsky

Mentor: Vinicius Rebello Lima

The goal of this project was to design a user friendly web design to embody a professional dental healthcare based in Detroit Michigan called Dental Home. The cool tones were used to convey classic dentistry feel. We wanted to make it easy to navigate so anyone could find the information they were looking for. The logo incorporated the title, Dental Home, while also using a house symbol and a dental utensil. We wanted to create a strong brand and web frame to continue consistency, making the piece cohesive by using color schemes and uniform patterns throughout the website. The audience we were looking to attract ranged from family oriented households to independent, high income professionals.

KIRKHOF CENTER GRR 070

What Really Caused the Flint Water Crisis in the City of Flint, Michigan?

Participants attending 11:00 AM - 12:00 PM

Presenter: Vincent Hrnyak

Mentor: Peter Wampler

The Flint Water Crisis made national news when the drinking water in Flint, Michigan changed its water source for the city to the Flint River. Flint's tap water became contaminated with high lead levels in April 2014. I will be using a ESRI Story Map to explain how lead ended up in the drinking water that devastated this Motor City. Story maps are a new way to share map-based data in a dynamic way that communicates spatial data. I will use ArcMap GIS to analyze the pipes and infrastructure that were involved in the contamination crisis. Research will include the age and technology of the pipes, and the corrosion factors involved in this multi-faceted crisis. I will also attempt to research what was in the makeup of the corrosive pipes and the Flint River water that contributed to the high contamination levels when the city switched sources. I will also address lead accumulation in old galvanized iron

pipes and if this should be a concern for other cities.

KIRKHOF CENTER GRR 071

Testing Functional Redundancy of Two *Candida albicans* Cell Surface Proteins

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM

Presenter: Julia Martiradonna

Mentor: Ian Cleary

Surface proteins are important contributors to virulence in the fungal pathogen *Candida albicans* through their influence on adhesion to living and non-living surfaces and biofilm formation. Two genes that encode surface adhesins are *ALS3* and *DDR48*. A strain lacking *ALS3* forms normal hyphae, but is reported to be defective in biofilm formation. The expression of *DDR48* is highly upregulated in hyphae. Its function is not entirely clear, but a strain lacking *DDR48* shows adhesion defects when grown in the presence of 3-AT, a competitive inhibitor of the histidine biosynthetic pathway that induces amino acid starvation. To test whether *DDR48* could compensate for a lack of *ALS3*, we over-expressed *DDR48* in the *ALS3* deletion strain and tested biofilm formation using the 96-well microtiter plate model. We found that *DDR48* over-expression did have compensatory function in adhesion and that growth medium influences the severity of the observed changes in biofilm formation.

KIRKHOF CENTER GRR 072

Developing a Procedure for Studying the Acute Effect of BMPEA on Porcine Basilar Arteries

Participants attending 9:00 AM - 10:00 AM

Presenters: Joshua Ferguson, Madison Miller, Asia Williams

Mentor: Francis Sylvester

The goal of this study is to develop a procedure for recording the changes in vascular reactivity of the porcine basilar artery to a sympathomimetic, β -methylphenethylamine (BMPEA). Brains will be obtained from a local abattoir and the basilar artery will be carefully dissected and placed in Krebs-Henseleit buffer. Small segments of the artery will then be cut, mounted on force transducers, and submerged in buffer in isolated organ baths. The arterial rings will then be equilibrated for 1 hour in buffer bubbled with 95% O₂ and 5% CO₂. The basilar arteries will be treated with increasing concentrations of potassium chloride (a known vasoconstrictor) followed by sodium nitroprusside (a known vasodilator) to serve as positive and negative controls. Arteries will then be treated with BMPEA to determine if it is vasoactive. Results from this study will be compiled with earlier studies in the lab to fully characterize the effects of BMPEA in various circulations.

KIRKHOF CENTER GRR 073

Soil is the New Teapot: How Tea Bags Tell Us About Global Carbon Cycling

Participants attending 9:00 AM - 10:00 AM

Presenter: Caleb Krueger

Mentor: Robert Hollister

Polar biomes are generally described as having low decomposition rates due to cold soils. With global warming the soils are expected to warm, and soil decomposition rates may increase. These changes could potentially shift the carbon balance of arctic tundra ecosystems from carbon sinks to sources. To better understand and document decomposition rates, an international effort has created a standardized protocol, the Tea Bag Index (TBI), to

calculate decomposition rates (k) and sequestration potentials (S) in any ecosystem. We used the TBI at two sites in northern Alaska and found that both locations had higher S values than previously studied ecosystems, indicating that tundra ecosystems may function as carbon sinks. However, k values were higher than anticipated, although values were still lower than in most biomes. This suggests that the sites metabolize a smaller fraction of organic matter compared to any biome but that the rate of this breakdown is similar to other ecosystems.

KIRKHOF CENTER GRR 074

Structural Analysis of a Novel Inhibitor Bound to *Acinetobacter*-derived Cephalosporinase (ADC-7)

Participants attending 10:00 AM - 11:00 AM

Presenter: Erin Fish

Mentor: Bradley Wallar

Present day bacteria have developed many resistance mechanisms to combat β -lactam antibiotics. One of these is the production of β -lactamases which break down the antibiotics, rendering them ineffective. In *Acinetobacter baumannii* infections, the production of *Acinetobacter*-derived cephalosporinase (ADC) β -lactamases provide a bacterial mechanism for deactivating antibiotics. In order to design a molecule that inhibits the ADC enzyme, it is imperative to determine the structure of the ADC enzyme with the inhibitor molecule bound. We have characterized another group of novel inhibitors containing a triazole ring that are easier to synthesize and modify than previous inhibitors. We have determined the structure of the triazole-containing inhibitor, s06015 in complex with ADC. Future studies will determine if triazole-containing compounds inhibit ADC at a high level, as their ability to be modified serves as a more practical option for possible future clinical applications.

KIRKHOF CENTER GRR 075

Identification and Expression Analysis of Phenylalanine Ammonia-Lyase in *Echinacea purpurea*

Participants attending 9:00 AM - 10:00 AM

Presenters: Christopher Avey, Megan Goy

Mentor: Sheila Blackman

Echinacea purpurea is increasingly important as a source of medicinal phenylpropanoids. The aim of this work is to identify growth conditions that promote medicinal potency of the crop. We hypothesize that growing the plants with a legume cover crop will induce the Phenylpropanoid Pathway and lead to higher bioactive compound concentration. Phenylalanine Ammonia-Lyase (PAL) catalyses the first committed step in the Phenylpropanoid Pathway and its expression mirrors the activity of this pathway. In this study, an *E. purpurea* PAL sequence was obtained via Polymerase Chain Reaction using cDNA synthesized from leaf tissue and primers designed from PAL sequences of related taxa *Helianthus annuus* and *Rudbeckia hirta*. This sequence will be used to design primers to monitor expression of this gene through qPCR of plants grown with and without the legume cover crop. The results will provide an understanding of the effect of cover cropping on yield and medicinal quality of *E. purpurea*.

KIRKHOF CENTER GRR 076

Sexual Inversion in the 19th Century

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenter: Rachael Zuiderveen

Mentors: Julia Mason, Leifa Mayers

People labeled as gender variant or suffering from sexual inversion during the 19th century were assumed to be linked to mental illness, criminality, or deviance, and the medical literature concerning their existence deserves analyzing. My methodology pays specific attention to the historical context in which these people and their identities existed, along with the discourse and cultural attitudes during the time period held by medical professionals. This project will analyze medical literature written by physicians and scholars during the 19th century that centers around sexual inversion and gender variance, and their relation to mental illness/deviancy and other cultural attitudes. Medical and cultural attitudes surrounding these issues along with their lasting legacy have largely been left unexamined.

KIRKHOF CENTER GRR 077

Measurement and Statistical Analysis of Submarine Internet Cable Performance

Participants attending 3:00 PM - 4:00 PM

Presenter: Gloire Rubambiza

Mentor: Dirk Grunwald

The network of submarine cables spanning the oceans handles an overwhelming majority of the transcontinental Internet's traffic. Internet performance metrics such as available bandwidth and packet latency provide insight into the performance of a wide-area network. For instance, the packet latency and available bandwidth data may show the average round-trip time and bottleneck encountered by a packet. Currently, Internet performance metrics for terrestrial networks are known from previous studies. However, little is known of the performance of submarine Internet cables due to a lack of studies and confidentiality agreements. Using tools such as *pathload* and *traceroute*, we collected and analyzed available bandwidth and latencies of packets sent across submarine cables linking North America to Europe over time. The results showed that packets traversing submarine cables take a default route on a given day and the possibility to distinguish submarine cables.

KIRKHOF CENTER GRR 078

The Reversal of Northern Cities Vowel Shift in West-Central Lower Michigan: BAT, COT and BOUGHT

Participants attending 11:00 AM - 12:00 PM

Presenter: Gerrit Knopf

Mentor: Wil Rankinen

The present study investigates the acoustic properties of the American English BIT, BET and BUT vowels among life-long west-central Lower Michigan residents to determine if such speech communities are participating in the Northern Cities Vowel Shift (NCVS). For a person fully participating in the shift, the BIT vowel would be pronounced closer to BET, the BET vowel closer to BAT or BUT, and the BUT vowel closer to BOUGHT. The sociolinguistic variables considered include age, sex, and Dutch/non-Dutch heritage among 40+ life-long residents from Michigan's Kent and Ottawa counties. While previous research suggests the NCVS has been dominant in the Midwest since the 1960s, recent research in neighboring areas of Lansing found young female speakers are now leading in the NCVS reversal. Furthermore, preliminary results of the present study exhibits a similar NCVS reversal in west-central Lower Michigan.

KIRKHOF CENTER GRR 079

Effects of Ammonium Chloride Solutions on Erythrocyte Morphology Across Species

Participants attending 11:00 AM - 12:00 PM

Presenters: Sydney Brougham, Joanna Lee

Mentor: Christopher Pearl

The experiment that explores osmosis in the BMS 291 laboratory course currently requires optimization. Specifically, the expected crenation and lysis of sheep erythrocytes upon NH_4Cl introduction does not occur in a predictable manner due to timing problems. It should be possible to remedy these inconsistencies by altering the content of the solution and/or changing the animal species of erythrocytes. Solutions of NH_4Cl , NH_3 , CaCl_2 , and KCl were tested in concentrations ranging from 0.1M to 0.4M, and the sources of blood were sheep, rabbit, bovine, and horse. Results suggest that both ammonia and chloride content independently contribute to changes in cell morphology and their timing. The changes are also influenced by membrane properties unique to each species, therefore the choice of blood can affect observational outcomes. The optimal combination of these factors will lead to improved visualization of cell changes, and ultimately the overall learning experience for future students.

KIRKHOF CENTER GRR 080

Monitoring Change in Species Density Over Time in Arctic Alaska

Participants attending 1:00 PM - 2:00 PM

Presenters: Jacob Harris, Kailey Keenan-Whittemore

Mentor: Robert Hollister

The Arctic regions of the world are experiencing rapid climate change. In order to understand the impacts of a changing environment on vegetation dynamic, researchers from Grand Valley have been conducting long-term ecological monitoring on the species composition in the tundra at Atkasuk, Alaska. The purpose of this project was to document the change in plant density over time of the vegetation growth forms. We also examined how different growth forms relate to one another and how the relationship may differ across sites. We found an increase in the density of deciduous shrubs over time in some communities and an increase in forbs in other communities. Documenting these changes is a necessary step toward understanding the impacts of changing climate on tundra ecosystems.

KIRKHOF CENTER GRR 081

Cold-Hardening and Supercooling in a Broadly-Distributed Jumping Spider: How Low Can You Go?

Participants attending 9:00 AM - 10:00 AM, 1:00 PM - 2:00 PM

Presenters: Sophia Hamilton, Alex Kayfish

Mentor: Michael Henshaw

Phidippus audax is a common, North American jumping spider, ranging from northern Mexico to southern Canada, and, therefore, must overwinter in freezing conditions. To better understand overwintering in *P. audax*, we measured their supercooling point (SCP), or the lowest temperature before body fluids freeze. We collected 55 spiders from Ottawa County, MI. Spiders were collected from resting nests in fences between September 2017 and January 2018. We cooled each spider from 15 to -20 C and monitored them for the exotherm that results when their tissues freeze. The SCP was the lowest temperature reached prior to freezing. Spiders experienced cold-hardening in the fall, and the SCP dropped from an average of -3.75 C in September to -10.1 C in December with a minimum of

more than -17 C. We think that the distribution of the trait of cold hardening could greatly vary by climate and hope to measure SCP in other regions of North America to examine that question.

KIRKHOF CENTER GRR 082

Characteristics of a Random Sample of Food Pantry Users in Grand Rapids, MI

Participants attending 11:00 AM - 12:00 PM

Presenter: Eva Andrews

Mentor: Deborah Lown

Introduction: Millions of Americans are food insecure, with limited or uncertain ability to acquire nutritious and adequate food. Chronic food insecurity leads to long-term use of food pantries, which often provide food lacking in nutritional quality. Food insecure individuals are often obese due in part to the lack of nutritious foods available. Obesity is linked to increased prevalence of chronic disease increasing healthcare costs. This study aims to describe the food pantry clients in Grand Rapids, including prevalence of chronic disease, food insecurity, and nutritionally inadequate diets. Methods: Surveys completed by food pantry clients at 6 local pantries will provide data to describe food pantry clients. Results: I anticipate that the findings will show that poor health, food insecurity, and low quality diets are common for food pantry clients. Discussion: Describing food pantry clients may lead to changes in services provided to improve the health and diet of clients.

KIRKHOF CENTER GRR 083

Comparison of Music and Verbal Encouragement on Muscular Endurance During Bench Press

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenters: Rachel Darin, Deborah Minor, Lindsey Remski, Tori Smith

Mentor: Ross Sherman

Background: Music and verbal encouragement are used to improve muscular endurance, however there is no research comparing the two techniques in bench press performance. Purpose: The aim of this study is to compare the effectiveness of music and verbal encouragement on muscular endurance during bench press. Methods: Healthy GVSU students with bench press experience participated in this randomized crossover study. A one repetition maximum (1RM) test for the bench press was performed. During test sets, the barbell was loaded with 70% of the participants' 1RM and participants were instructed to perform as many repetitions as possible. For the music condition, participants came to the lab with a self-selected playlist that the participant considered motivating and was played during the test. For the verbal encouragement condition, the researchers provided different pre-selected phrases intended to encourage the participant throughout the test set. Results: Data will be presented at SSD.

KIRKHOF CENTER GRR 084

Fighting the Opioid Epidemic at the Provider Level

Participants attending 11:00 AM - 12:00 PM

Presenters: Haley Barnard, Lauren Borucki, Nicole Gustin, Alycia Pipe, Molly Ritsema, Jacqueline Simmers, Natalie Smedes

Mentor: Meridell Gracias

In collaboration with the Kent County Health Department, our project focuses on addressing the opioid epidemic

at the provider level. Our group chose to narrow our focus to dental professionals, as 12% of opioid prescriptions come from dental procedures. Dental providers are also unaware of the phenomena “doctor shopping.” The opioid epidemic is a public health emergency for not just Kent County, but also the United States as a whole. We hope to educate dental providers about these shocking statistics and help providers use a questioning attitude before writing prescriptions. 80% of Kent County heroin addicts admit their addiction started with a pain medication prescription. We feel that the education we provide to Kent County dental providers can help reduce the number of overdose deaths, which has been on the rise since 2010, with only a slight decline in 2014.

KIRKHOF CENTER GRR 085

Evaluation of the Relative Timing of Chert Nodule Formation in Kentucky’s Late-Silurian Brassfield Formation

Participants attending 9:00 AM - 10:00 AM, 11:00 AM - 12:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM

Presenters: Matthew Clark, Kristi Hill, Tani Richter, Eric Schuemann

Mentor: Peter Riemersma

While outcrops of interbedded dolomite and chert aren’t rare, their exact mechanism of formation is often a mystery. Our Brassfield Formation outcrop is dolomitized and contains lenses and nodules of chert. The focus of our study is to determine if chert formed before or after the dolomite. Since the process of dolomitization tends to destroy fossil fabric, we will look for samples that preserve fossils in chert (as it is resistant to hydrothermal alteration). This would indicate chertification occurred before dolomitization. No preserved fossils would indicate dolomitization preceded chert formation. The pertinent literature reveals that chemical analysis can often illuminate the stages of diagenesis that follow deposition of limestone. Examination of prior research, observations in the field, and analysis of hand samples/thin sections collected from the Brassfield outcrop will help shed light on the features observed at this location.

KIRKHOF CENTER GRR 086

Cx43 Response of Endothelial Cells to DHA is Not Mediated by the FFAR4

Participants attending 9:00 AM - 10:00 AM

Presenter: Morgan Sundblad

Mentor: David Kurjiaka

Endothelial cell (EC) health is important in the formation of atherosclerotic plaques. ECs respond to free fatty acids (FFA) in circulation. These FFA influence risk of cardiovascular diseases: saturated FFA increase whereas Omega3 polyunsaturated FFA decrease risk. FFA structure may influence plaque growth through localized inflammation. As health of ECs is important in plaque formation, the role of Omega3 FFA DHA on EC health is of interest. Omega3s bind to the FFA receptor 4 (FFAR4). Connexin 43 expression was evaluated as a marker of inflammation (increases with inflammation). bEnd.3 cultured EC were treated with 30 uM DHA and protein isolated at times up to 48 hours. Data shows EC response to DHA is time dependent: expression had decreased by 24 hrs. At 24 hrs, blocking the FFAR4 receptor with 5 uM AH-7614 did not alter response. Thus, the DHA induced decrease in Cx43 expression did not involve the FFAR4. The identity of the receptor mediating this response may be the FFAR1.

KIRKHOF CENTER GRR 087

“But Is That Really Writing?”-- Let’s Talk About Multimodality In The First-Year Writing Classroom

Participants attending 9:00 AM - 10:00 AM

Presenter: Christine Kovacs

Mentor: Laurence Jose

With the influence of digital tools, writing studies have made room for texts that use more than just words. To best prepare students for the realities of writing outside of the classroom, the field has pushed for integrating different modes such as visuals or sounds into writing pedagogy (Kress, Selfe, Ball). Though this shift began in the late 1990s, the challenges related to a multimodal approach to writing are still part of today's conversations in the field. To illustrate and answer some of the core questions regarding the benefits of multimodality in writing pedagogy, I will present two lesson plans aimed at persuading teachers of first-year writing to embrace multimodality. The first will teach multimodal narratives to show how a traditional freshman composition assignment can be adapted into an equally effective multimodal one. The second will demonstrate how multimodal pedagogy can be implemented without technology during the brainstorming and invention phase.

KIRKHOF CENTER GRR 088

Effects of Diet on Multiple Sclerosis

Participants attending 10:00 AM - 11:00 AM

Presenter: Sarah Bertus

Mentor: Grace Huizinga

Multiple sclerosis (MS) is an autoimmune disorder of the central nervous system (Fallon, 2006). There is no known cause or cure. Medications only aim "to modify the disease course, treat relapses...and manage symptoms" ("Treating MS", 2017). Aside from medicinal treatments, alternative treatments are used. Many physicians have proposed dietary alterations to relieve symptoms of MS. Diets low in saturated fat have been seen to extend patients' lifespans and reduce disease progression (Yadav et al., 2016). Specific nutrients have also been said to reverse symptoms ("The Wahls Diet for Multiple Sclerosis", 2017). This literature review examines the effects of diet on both the physiological progression of MS and the quality of life of patients. Further investigation of these factors may bring scientists closer to finding a cause and cure ("The Wahls Diet for Multiple Sclerosis", 2017). If dietary treatments are deemed effective, they could save patients from drug side effects and costs.

KIRKHOF CENTER GRR 089

Validation of Isoproterenol-Induced Vasodilation in Renal Arteries

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM

Presenters: Joleen Cejmer, Sophia Chang

Mentor: Francis Sylvester

The goal of this study was to observe the vasodilator effect of a β -adrenergic agonist, isoproterenol, using an in vitro animal model. Porcine segmental arteries were dissected from kidneys obtained from a local abattoir, cut to 2-3mm in length, and mounted on force transducers situated within isolated organ baths. Arterial rings were then equilibrated for 1 hour in Krebs-Henseleit buffer bubbled with 95% O₂ and 5% CO₂. All arteries were preconstricted with the α -adrenergic agonist, phenylephrine, for fifteen minutes prior to the addition of increasing concentrations of isoproterenol. Isoproterenol induced significant vasodilation in the segmental arteries (10^{-5} - 10^{-4} M). This study successfully reproduced the classic response of systemic arteries to a β -adrenergic agonist.

KIRKHOF CENTER GRR 090

Refining Your Reading Skills with the Prosody Training App

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 1:00 PM - 2:00 PM

Presenters: Madison Esselink, Tanner Kiessel, Michelle Roldan

Mentor: Jennifer Gross

Like music, spoken English has a rhythm. Yet, written English offers few prosodic cues (fresh produce; produce widgets). At all ages, prosody sensitivity plays a role in reading abilities. Extrapolating from psycholinguistic theory, the primary goal of the study was to heighten readers' prosody sensitivity by exposure to rhythm-enhanced text. During forced-choice training, participants were asked to pick the version of text (I **DO** not **LOVE** thee **WITH** mine **EYES** versus I do **NOT** love **THEE** with **MINE** eyes) that mapped onto the meter (iambic, trochaic, anapestic, and dactylic) of English. Performance feedback was furnished immediately or delayed. It was predicted that exposure to rhythm-enhanced text would strengthen prosody awareness compared to the control condition (making judgments about spelling & word usage), and immediate feedback would be more effective than delayed. Prosody sensitivity was also evaluated as an individual difference variable to determine who benefited from training.

KIRKHOF CENTER GRR 091

Moms Helping Moms Breastfeed in Kent County

Participants attending 4:00 PM - 5:00 PM

Presenter: Regina Kirwin

Mentor: Kelli Damstra

Moms Helping Moms Breastfeed Peer Mentor Program is a project through the Kent County Health Department (KCHD) that aims to decrease the disparity in duration rates and initiation among African American women. The goal of this program is to improve racial equality in breastfeeding within this population. There are several benefits to breastfeeding for both mom and baby. The problem is that there is an obvious disparity in breastfeeding among African American women. The method used in this project was African American women mentoring other African American women. Mentor-mentee interaction styles were recorded and analyzed. Quantitative and qualitative data were collected using surveys and focus groups. The program outcomes consisted of increasing breastfeeding initiation and duration rates and mentor-mentee satisfaction and support. The purpose of this presentation is to disseminate the lessons learned through data collection and analysis.

KIRKHOF CENTER GRR 092

Doctor of Nursing Practice (DNP) Project Quality

Participants attending 1:00 PM - 2:00 PM

Presenter: Hannah Rojas

Mentor: Sandra Spoelstra

The Doctor of Nursing Practice (DNP) is a new degree, and has led to plenty of quality variation when comparing the completed DNP projects. The purpose of this project is to take the strengths of each DNP Project to inform curriculum, syllabi and guide the future DNP projects. The four key examined aspects of the DNP Projects vary to improve the quality of each. The past DNP Projects published in ScholarWorks will be examined specifically for theories, models, frameworks, and implementation strategies. The extracted data will be compiled in an Excel sheet and analysis will be conducted using descriptive statistics through SPSS. Once completed, the project and results will be presented at the event. The quality improvement project will serve as a reference point to inform

future KCON students who will be conducting DNP Projects; faculty who teach theories, models, frameworks and implementation strategies, and the DNP curricula.

KIRKHOF CENTER GRR 093

Effects of Leptin Deficiency Induced Obesity on Fertility Parameters in Male Mice

Participants attending 3:00 PM - 4:00 PM

Presenter: Morgan Doherty

Mentor: Christopher Pearl

Obesity rates doubled from 1980 to 2014 and is an epidemic today. Obesity is linked with various health issues but its reproductive effects remain unsolved. Leptin is a hormone secreted by fat tissue and helps to control a number of body processes. Leptin and leptin receptor deficiency lead to obesity and may be related to impaired fertility parameters. In this study, male c57, ob/ob, (leptin deficient) and db/db (leptin receptor deficient) mice were raised to 8 and 16 weeks when tissues were collected and evaluated. Obesity was evident in both the ob/ob and db/db groups since body weight was grossly larger than c57 mice. Sperm/mg in the testis was reduced in the ob/ob group compared to controls but not in the db/db group at both age groups, suggesting that lack of leptin reduces sperm production. Total sperm in the epididymis increased in controls with age but was decreased in both obese groups suggesting leptin related obesity impairs sperm storage and likely male fertility.

KIRKHOF CENTER GRR 094

Graph-Complement Pairs with Extremal Numbers of Dominating Sets

Participants attending 1:00 PM - 2:00 PM

Presenter: David Shane

Mentor: Lauren Keough

A mathematical graph is a collection of vertices and edges connecting these vertices. A dominating set of a graph is a set of vertices such that all vertices of the graph are in that set or connected by an edge to a vertex in that set. Given a graph G , the complement of G , denoted G' , is the graph such that if two vertices are not connected in G , then they are connected in G' , and vice versa. In 2010, Dr. Stephan Wagner proved a lower bound for the number of dominating sets of a graph plus the number of dominating sets of that graph's complement in terms of the number of vertices of that graph, and noted that finding an upper bound for the same sets would be much more difficult. We investigated this upper bound problem with data and found what we believe to be the unique solution, and have derived a formula to express this upper bound in terms of a given number of vertices. We will discuss how we have attempted to prove this conjecture, and what path we think will lead to a solution.

KIRKHOF CENTER GRR 095

College Without Caffeine?

Participants attending 9:00 AM - 10:00 AM

Presenter: Jenna Tefend

Mentor: Amy Manderscheid

One thing that many college students have in common is the regular intake of caffeine to cope with busy schedules and early mornings. What caffeine users do not always consider, however, are the effects that caffeine has on various aspects of one's health. This study focuses on how caffeine impacts sleep quality, sleep duration, and daytime alertness, using myself as the subject. The results suggest that sleep duration and sleep quality improve

quickly after the cessation of caffeine intake. Although correlations between caffeine intake and daytime alertness were not found, an increase in daytime alertness toward the end of the study suggests the possible presence of an adjustment period where the body must get used to the absence of caffeine.

KIRKHOF CENTER GRR 096

An Investigation in the Awareness of Desirable Difficulties in Undergraduate Chemistry Courses

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenter: Emily Uhl

Mentor: Thomas Pentecost

A deeper learning can be achieved through the use of desirable difficulties. Incorporating the ideas of testing v. restudying, spacing v. massing, interleaving v. blocking, and varying conditions of learning into studying practices can create a beneficial cognitive challenge. This study explores the extent to which professors and students in college chemistry courses recommend/utilize desirable difficulties. Cognitive interviews were conducted with chemistry faculty, and a survey that was constructed based on existing surveys was given to current chemistry students. Preliminary results suggest that students understand that study strategies employing desirable difficulties would lead to more learning, but choose to use less effective practices. The cognitive interviews suggest that professors are not aware of the positive significance that incorporating desirable difficulties into instruction and self-regulated study could have on their students' learning.

KIRKHOF CENTER GRR 097

The Dead Sea Scrolls: Uncovering the History of the Bible

Participants attending 3:00 PM - 4:00 PM

Presenter: Kelsey York

Mentor: Sheldon Kopperl

The Dead Sea Scrolls are ancient manuscripts that include many parts of the Bible. In fact, parts of every book of the Old Testament, except the book of Esther, are included in the Dead Sea Scrolls. These manuscripts are the oldest version of the Hebrew Bible that we have, and although many of the scrolls are fragmentary, with little readable on each piece, many of them are still able to be interpreted. The most intriguing aspect of the Dead Sea Scrolls is that, even though the books of the Old Testament of the Bible were written independently from the scrolls, the comparison of the prophecies of these scrolls to that of our current Bibles is a 99.8% match. Since the Dead Sea Scrolls were written with the same messages as the Old Testament, both of these texts can be used to test the legitimacy of prophets in accordance with the historical events of the New Testament. By putting these prophets to the test, the accuracy and authenticity of the Bible can be confirmed.

KIRKHOF CENTER GRR 098

Using Principal Component Analysis to Identify Changes in Phosphorus, Nitrate/nitrite, and Chlorophyll-a in Seven Lake Basins of Leelanau County (Michigan) from 1990-2015

Participants attending 9:00 AM - 10:00 AM

Presenter: Ellen Audia

Mentor: M Woller-Skar

The Leelanau Conservancy is home to seven lake basins, all of which Leelanau County relies on as tourist

and recreational attractions. Since nutrient content is a key metric in understanding water quality, the Leelanau Conservancy has been monitoring phosphorous, nitrogen, and chlorophyll-a levels in each lake for the past 25 years. Measurements were taken at the surface, bottom, and intermediate depths of each lake during different seasons throughout each year. With 25 years of data collected from four depths in seven lakes, multivariate statistical techniques were needed to identify long-term trends in water quality. A principal components analysis (PCA) was performed on the data using the program R. The resulting biplots showed evident seasonal changes in five lakes, a decrease in nutrients from 1990-2015 in all lakes, and lower levels of nitrogen in three lakes after zebra mussels invaded. These results will be communicated to the Leelanau Conservancy for use in managing their lake basins.

KIRKHOF CENTER GRR 099

GV Locate

Participants attending 9:00 AM - 10:00 AM

Presenter: Michael Kranker

Mentor: Roger Ferguson

As a technologically advanced culture, where powerful computing devices are in the palms of our hands, the use of PDF files to represent maps is not utilizing the technology available. The people that use these maps (i.e., PDF files), are presented with hard to read points of interest, outdated information on structures within the map (e.g., buildings, roads, etc.), and most importantly, have reported a general difficulty finding their way around. My project is centered around solving the issues of using PDF maps. Institutions, communities or any organization that wants to help people navigate will benefit from this new technology. GVSU is a typical example of this. I've created a mobile web application utilizing current web technologies, in particular, a full-stack Javascript solution for both the front end user interface, and the back end REST server for handling the data points. As a result, the user will be presented with a more up to date, readable online mapping system.

KIRKHOF CENTER GRR 100

Resiliency in Ghanaian Nursing Culture: A Student's Perspective

Participants attending 11:00 AM - 12:00 PM

Presenter: Jayme Larson

Mentor: Susan Harrington

This project reports the resiliency observed in the Ghanaian nursing culture during an observational period of six weeks. Research was focused on characteristics typically possessed by resilient individuals, including optimism, adaptability, a sense of humor, having a mentor in the workplace, clinical expertise, education, teamwork, reassurance, socialization, and spirituality. This study also contained research on nursing care for a set of symptoms common in chronic, or life-limiting medical conditions, including skin discoloration, decreased level of consciousness, tachycardia, hypotension, decreased urinary output, weight loss, dehydration, development of decubitus ulcers, noisy respirations, shortness of breath, Cheyne-Stokes breathing, weakness and fatigue, disorientation, hallucinations, pain, malnourishment, and edema. Research on resiliency and what characteristics foster a resilient attitude is absolutely imperative for the nursing profession and patient safety.

KIRKHOF CENTER GRR 101

Expression of Aromatase and Androgen Receptor in Leptin Deficient Obese Mice

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenter: Gabriella Born
Mentor: Christopher Pearl

Sperm are produced in the testes and matured in the epididymis. When sperm enter the epididymis from the testes they are immotile but mature throughout the epididymis and are eventually stored in the cauda epididymis. Estrogen and androgens each contribute to the control of testicular and epididymal function. Leptin and leptin receptor deficiency lead to obesity which is correlated with declines in male fertility. This study investigated the expression of hormone receptors and enzymes in testis and epididymis in control mice (C57), leptin receptor deficient mice (db/db), and leptin hormone deficient mice (ob/ob). Expression of proteins was investigated using immunohistochemistry. At eight weeks of age aromatase was expressed in testicular Leydig cells. Androgen receptor was expressed in testicular Sertoli and Leydig cells and epithelial cells of the epididymis. Sixteen week old tissue is currently being investigated.

KIRKHOF CENTER GRR 102

The Impact of Study Abroad on Student Perspectives of Cultural Competency

Participants attending 10:00 AM - 11:00 AM

Presenter: Emma Branch

Mentor: Melodee VandenBosch

The purpose of the study was to create a literature review by analyzing 15 articles related to nursing students who studied abroad. Then, to create a survey tool to help standardize data from other students who study abroad. Finally, to distribute the survey tool to a group of nursing students going to Ghana, and to synthesize their answers. The literature search began with finding articles through the CINAHL database. The survey tool was created based on common information gathered from the studies and questions pertaining specifically to nurses and culturally competent care. Most articles concluded there was an increase in cultural competence and awareness. Most students who studied abroad also reported improved confidence, self-awareness, and nursing skills. Limitations mentioned included the language barrier, lack of diverse participant demographics, and a small sample size. Results from the researcher's distributed surveys are pending.

KIRKHOF CENTER GRR 103

Establishing Normative Values For Weight-Bearing Hip Rotation Range Of Motion

Participants attending 1:00 PM - 2:00 PM

Presenters: Josephine Freybler, Dalton Peyton, Lindsey Remski, Jacob Sommers, Brittany Sugg, Alexis Van Dusen

Mentor: Heather Gulgin

Range of motion (ROM) is typically measured in a non-weight-bearing status; however, we participate in sport activities when in weight-bearing (WB) condition. The purpose of this study was to establish normative values for WB hip rotation ROM. 135 participants were separated into two different age categories: 18-35 (20.7 ± 3.3 yrs., 173.4 ± 9.7 cm, 74.3 ± 18.4 kg, 24.2 ± 3.9 BMI) and 36-55 (45.2 ± 6.0 yrs., 173.0 ± 9.7 cm, 76.8 ± 19.9 kg, 25.4 ± 4.8 BMI). Hip internal and external rotation were measured on the Functional Footprint® device. A One-way ANOVA tested for significance ($p < 0.05$) between the two age categories for each variable. There was no significant difference between hip internal or external rotation between the two groups, and no significant difference between right and left sides. Normative values for healthy adults were established and may be used to compare to other active range of motion values for hip rotation.

KIRKHOF CENTER GRR 104

Perceived Back Pain Due To Backpack Use on D2 Midwestern University Campus

Participants attending 9:00 AM - 10:00 AM

Presenter: Rachel Shippy

Mentor: Kimbo Yee

Back pain is one of the most common health disparities among college students. Research has shown backpack usage to be linked to back pain in school age children; however, little research has been done to examine the association between backpack usage and back pain amongst college students. The purposes of this study were to: 1) describe how backpacks are used by students at a D2 Midwestern University; 2) describe self-reported back pain related to backpack usage and 3) and evaluate the relationship between self-reported back pain and backpack usage. A cross-sectional, online survey of 448 GVSU students assessed backpack carrying characteristics (e.g., perceived backpack weight, usage duration) and perceived back pain related to backpack use. Data will be presented at SSD.

KIRKHOF CENTER GRR 105

Geometries from Groups

Participants attending 2:00 PM - 3:00 PM

Presenter: Casey Koch Larue

Mentor: Steven Schlicker

Groups are mathematical objects that help illuminate many contexts, from describing the symmetries present in a configuration of atoms in chemistry to determining the impossibility of certain compass and straightedge constructions in geometry. The study of groups often involves studying the groups within groups (called subgroups) and moreover taking into account the subgroup structures of groups. We present a new way to visualize the subgroup structures of groups using finite geometries, and we apply our approach to finite cyclic groups. We describe a characterization of all of the lines for the geometries of finite cyclic groups. We also state an application of this result to show that the geometries reflect relationships between pairs of finite cyclic groups. Funding for this research was provided by the GVSU Student Summer Scholars Program of 2017.

KIRKHOF CENTER GRR 106

Endorsement of Religious Prosociality Stereotype Predicts Attributions of Religious Moral Motivation

Participants attending 11:00 AM - 12:00 PM

Presenters: Morgan Maley, Solona Skubick

Mentor: Luke Galen

Religious belief is often regarded as necessary for morality. This is a stereotype that varies as a function of individuals' own religiosity, leading them to make attributions about the motivation for moral behaviors. A religious moral attribution may be to explain behavior based on faith as opposed to a secular attribution based on others watching. It is unclear if an endorsement of the religious morality stereotype affects attributions for others' morality in situations where there are no specific references to religiosity. The degree to which participants at Time 2 attributed religious motivations for others' morality was significantly correlated with stereotype endorsement at Time 1. Participants with greater endorsement made relatively lesser attributions to internal motivation for others' morality. These findings indicate that self-reports of religious attributions for morality are affected by general stereotypical

beliefs that religion is necessary for morality.

KIRKHOF CENTER GRR 107

Investigation of Novel Silicon Anions as Reagents for Synthesis

Participants attending 11:00 AM - 12:00 PM

Presenter: Madelyn West

Mentor: Randy Winchester

The discovery of new materials advances technology and this project is aimed at developing novel silicon compounds that can be used in making new materials. To do this we are investigating silicon-carbon double bonds by synthesizing vinyl silyl anions. In our studies, 9-(bromomethylene)-9H-fluorene was prepared through a Wittig reaction with fluorenone. The bromo compound was in turn subjected to lithium-halogen exchange, turbo Grignard, and nucleophilic addition-elimination reactions in an attempt to form 2-((9Hfluoren-9-ylidene)methyl)-1,1,1,3,3,3-hexamethyl-2-(trimethylsilyl)trisilane. Because our attempts with the bromo compound were not successful, the bromine was replaced with a more efficient leaving group. A halogen exchange through a Finkelstein reaction was utilized to substitute the bromine for an iodine. The iodo compound was then also successfully prepared through a Wittig reaction in a manner similar to the initial preparation of the bromo compound.

KIRKHOF CENTER GRR 108

Patterns of Intergenerational Empathy and Peer Victimization in Mothers and Their School-Age Children

Participants attending 9:00 AM - 10:00 AM

Presenters: Caroline Bartes, Jenna Beffel, Jenna Bekkala

Mentor: Naomi J. Aldrich

We examined intergenerational relationships between mother-child experiences of bullying and empathetic abilities. Mothers completed a retrospective bullying questionnaire and empathy assessments for their child and themselves; their 7- to 13-year-olds completed a victimization/bullying scale. Children's victimization and empathy was significantly related to maternal victimization and empathy, respectively.

KIRKHOF CENTER GRR 109

Sound Synthesis and Software Step-Sequencer

Participants attending 1:00 PM - 2:00 PM

Presenter: Grant Miller

Mentor: Roger Ferguson

A step-sequencer is a piece of software or hardware used by musicians to play back audio signals. The form of this project is the rhythm sequencer style. In this style of sequencer, the user selects the timing for the audio triggers using buttons that simulate the individual beats of a four bar scale (typically in quarter notes, with sixteen buttons total). Few software sequencers exist in a form that closely mimics the look and functionality of hardware sequencers. The goal of this project is to create a software step-sequencer that mimics hardware sequencers. To do this, the project will be written in the C# programming language. I seek to learn about programming with audio during the lifetime of this project. Audio and music are my greatest areas of interest, and being able to develop some understanding of the implementation, execution, and limitations of working with audio in programming is a personal goal in this project.

KIRKHOF CENTER GRR 110

Tradition on Display: Graphically Representing Maasai Medicinal Ethnobotany In Kenya

Participants attending 10:00 AM - 11:00 AM

Presenter: Anthea Mitchell

Mentor: Kristin Hedges

As a supplement to ongoing work being done by Dr. Kristin Hedges with a Maasai community in Kenya, this poster is meant to fulfill a need expressed by older members of the tribe there. Due to the spread of biomedicine and changing lifestyles, the customs surrounding the use of traditional plants have changed. Previously, local plants were used to treat specific ailments, and also --perhaps more importantly-- to maintain individual and family health and strength. This use played a role in the identity of individuals as part of that community. There is an expressed concern that the knowledge of these plants and use of traditional medicines is being lost and, with that, protection over valuable resources. This visual guide to important plants identified by members of the community offers both the Maasai names and accompanying sample photos. It was made to take advantage of a cultural preference; many households in this region are inclined to use posters as décor. Traditional beadwork and illustrations will ideally improve the aesthetic appeal as ornamentation, and perhaps double as an aid in plant identification. In conjunction with other work, it is intended to act as one possible step towards cultural preservation.

KIRKHOF CENTER GRR 111

Characterizing the Cellular Functions of Protein Phosphatase 1 Isoforms

Participants attending 2:00 PM - 3:00 PM

Presenter: Christian Miller

Mentor: Ruijie Liu

Protein phosphatases are enzymes that have the function of dephosphorylating different protein substrates. This is done by removing a phosphate group from a specific amino acid residue on the protein. This protein phosphatase-regulated dephosphorylation is an important mechanism for many different processes and regulations inside mammalian cells. In this study, we examined the alpha and beta isoforms of protein phosphatase 1 (PP1). Specifically, we investigated the localization of these isoforms, with the alpha and beta isoforms being predominately expressed in the cytoplasm and nucleus of cells respectively. Furthermore, previous studies have shown that some histone deacetylases (HDAC's) and the cAMP regulatory element binding factor (CREB), may be substrate targets for the beta isoform of PP1 and as such, we also are examining how these affect gene expressions to get a better idea of the role that PP1 beta plays in the nucleus.

KIRKHOF CENTER GRR 112

Dental Topography of Maxillary and Mandibular Microbat Molars and Diet Reconstruction

Participants attending 1:00 PM - 2:00 PM

Presenter: Colin Pellegrom

Mentor: Laura Stroik

Mammalian dental anatomy has evolved in accordance with the physical properties of its diet, and multiple features on each tooth have specific functions related to the breakdown of food during mastication and ingestion. Calculation of dental topographic metrics for a mammal, such as relief index (RFI), Dirichlet normal energy (DNE), and orientation patch count-rotated (OPCR), can be used to predict its dietary preference. Analysis of these metrics

on maxillary and mandibular phyllostomid bat dentitions has indicated that upper second molars are as effective at dietary prediction as lowers, and a combination of upper and lower topography is ~95% effective at dietary prediction. Results from this study increase the dietary prediction accuracy for complete specimens and expand the current tooth selection for topographic analysis to include maxillary second molars. This research provides paleontologists with more freedom to accurately perform current and evolutionary analyses of species.

KIRKHOF CENTER GRR 113

Healthcare Inequalities: A Historical and Contemporary Review and the Nurse's Role

Participants attending 9:00 AM - 10:00 AM

Presenter: Danielle Mackey

Mentor: Jennifer Stewart

African Americans suffer a lingering racism that has been adapted into our current medical and social system. The purpose of this literature review is to study the history of healthcare inequalities between black and white people, to examine how they persist today, and to understand how nurses may inspire change. African American life expectancy is significantly lower than that of white people. While this may be partially connected to the stress of racism, the historical trend of environmental racism and the impact of current toxic exposures also affect African American life expectancy. Medical research, that once abused black people physically and psychologically, now works to exclude them from medical trials and new pharmacological discoveries. This has slowed African American progress in receiving new treatments that could help to decrease the health disparities. Nurses can work towards education and interventions to contribute to the effort to reduce these healthcare inequalities.

KIRKHOF CENTER GRR 114

Analyzing Survival, Growth, and Environmental Effects of Willow Biomass Energy Crops at GVSU

Participants attending 9:00 AM - 10:00 AM

Presenter: Jessica Crawford

Mentor: Erik Nordman

To alleviate global temperature rise, public and private sectors need to invest in carbon neutral energy. Woody biomass feedstocks can provide low-impact energy due to their capacity to sequester carbon during growing cycles. This project analyzes a small-scale trial production of four different willow (*Salix* spp.) clones grown at GVSU. The trial's purpose is to determine if and what kind of willow will be economically feasible for commercial production in West Michigan. The four willow varieties were planted in May 2016 in a randomized complete block design with four replications. Survival, growth, resistance, and soil composition data were collected during the first growing season. The plants in the center of each plot were measured and their attributes compared using analysis of variance. Preliminary results suggest there is no significant difference in survival and growth among clones. Measurements will continue through October 2017.

KIRKHOF CENTER GRR 115

Effect of L-Citruline Malate on Performance for Collegiate Rowers

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenters: Cassidy Bruins, Autumn Eubank, Dakota Mathews

Mentor: Kimbo Yee

Background: L-citrulline malate (CM) is an ingredient found in many pre-workout supplements. There is limited research about the effect of CM on aerobic performance in endurance trained athletes. Aim: The purpose of this study was to determine the effects of an acute dose of CM on the aerobic performance of collegiate rowers. Methods: Using a randomized, crossover study design, collegiate rowers (10 female; 12 male) participated in two 10-minute max distance rowing tests one week apart. Each week the subjects were randomly assigned to either an acute ingestion of CM one session and a placebo in the other. Results: There was no significant difference ($p=0.05$) in 10-minute rowing distance between the CM condition ($2632.8 \pm 180\text{m}$) and the placebo condition ($2671.2 \pm 197\text{m}$). Conclusion: The present study showed that an acute ingestion of CM did not improve aerobic rowing performance in endurance trained athletes.

KIRKHOF CENTER GRR 116

Study of Students' Understanding of Electrostatics Through Problem Categorization

Participants attending 9:00 AM - 10:00 AM, 11:00 AM - 12:00 PM, 4:00 PM - 5:00 PM

Presenter: Samantha Koch

Mentor: Bradley Ambrose

Savelsbergh et al. determined that novice students, when asked to categorize problems based on their solution approach, do not match the categories defined by experts. This project looks at how students of varying proficiency levels categorize problems on electric fields. We first gave a quiz to two full sections of PHY 231 (Principles of Physics 2) students ($N=76$) to determine their proficiency on Gauss' Law and electric fields. We then conducted think-aloud interviews with pairs of students ($N=10$) where they were asked to categorize a set of associated electrostatics problems. We compared how the students grouped the problems to the categorizations of physics faculty members ($N=3$) and characterized the students' categorizations as expert-like or expert-unlike. The goal was to obtain evidence for or against the premise that student categorization of problems could be used as an indicator of their quiz performance and, hence, their understanding of the underlying physics.

KIRKHOF CENTER GRR 117

Nociception in Crayfish: Behavioral Changes after Mechanical Injury

Participants attending 11:00 AM - 12:00 PM, 1:00 PM - 2:00 PM

Presenters: Daniel Marsden, Christopher Oliphant, Jonathan Stansbie

Mentor: Daniel Bergman

Nociception is the physiological detection of noxious, tissue-damaging stimuli, activating responses that assist in withdrawal from those stimuli. To examine nociceptive abilities of crayfish, an invertebrate, we consider the requirements of pain sensation in vertebrates. Criteria for pain includes a suitable nervous system and receptors, avoidance learning, reduction in use of the affected area, or autotomy. We examined the trade-off between pain and feeding. The pain stimulus varied with four groups each consisting of a complete excision: 1) right antennule, 2) both antennules, 3) right uropod, 4) both uropods. Each experimental group was compared to a control group that endured no excision. A Y-maze was divided in half with a correct arm (containing food) and incorrect arm (no food). The control group spent 64.3% of time in the correct arm and the right antennule excision group spent 55.8% of their time in the correct arm. We are continuing to analyze data for our other treatments.

KIRKHOF CENTER GRR 118

Powerfully Diverse YA Literature: Understanding the Current & Historical Implications of Canon

Participants attending 11:00 AM - 12:00 PM

Presenter: Joslyn Mara

Mentor: Bethany Peterson

Young adult literature catches the hearts and minds of its readers, but it suffers from a lack of representations of sexualities, cultures, genders, disabilities, races, mental health issues, and trauma. If it does exist, it is often inaccurate, oversimplified, or stereotypical to the point of doing more harm than good. I tackle how the typical YA canon was historically created and shaped. The typically exclusionary practices of canon formation are countered by my own attempt of making a canon, whose primary goal is to exalt and promote books that do represent these issues in complex, relatable ways. Collecting and sharing literature that includes positive and realistic representation is incredibly important because how we represent ideas, people, and places in literature shapes how each of us as individuals view and interact with the world, and this literary power should be used to build connections and understanding, instead of misconceptions and isolation.

KIRKHOF CENTER GRR 119

Evaluation of Leucine-rich Repeat Kinase 2 (LRRK2)-related MicroRNAs as Biomarkers for Parkinson's Disease

Participants attending 4:00 PM - 5:00 PM

Presenter: Macie Weiland

Mentor: Sok Kean Khoo

Parkinson's disease (PD) is a neurodegenerative disorder that affects over 6 million people worldwide. Progression of PD varies among patients in which slow progressors develop mild symptoms 10-20 years after diagnosis, and fast progressors develop severe symptoms less than 10 years after diagnosis. Currently, there is no laboratory test to determine the progression of PD upon diagnosis. Therefore, it is essential to identify blood-based biomarkers to differentiate fast from slow progressors for improved disease management. MicroRNAs miR-29a and miR-29c regulate the leucine-rich repeat kinase 2 (LRRK2) gene, which is known to be involved in the pathogenesis of PD. We performed quantitative real-time PCR to evaluate miR-29a/c expression on sera collected at time of diagnosis from 15 fast and 15 slow PD progressors. Using the Markov Chain Monte Carlo algorithm and logistic regression, there was no significant difference in miR29a/c expression between fast and slow progressors.

KIRKHOF CENTER GRR 120

Waterfowl Use of Artificial Storm Water Retention Ponds in Allendale, Michigan

Participants attending 11:00 AM - 12:00 PM

Presenter: Eleanor Di Girolamo

Mentor: Michael Lombardo

Waterfowl habitat use was examined at seven artificial storm water retention ponds located on the Grand Valley State University campus in Allendale, MI. Each week, I recorded the species and total number of individuals at each pond from October 2017 until late March 2018. Waterfowl species diversity and abundance data were compared to the physical characteristics of each pond (e.g., area, maximum depth, water flow, etc.) in order to assess the importance of these ponds as feeding and resting areas. Pond usage by waterfowl will be presented in relation to weekly temporal and environmental variations (e.g., date, temperature, cloud cover, etc.). An assessment of the use of artificial storm water retention ponds by waterfowl can provide insights into the importance of artificial habitats for conservation efforts.

KIRKHOF CENTER GRR 121

The Talk About Racism

Participants attending 10:00 AM - 11:00 AM

Presenter: Audrey Tappenden

Mentors: Julia Mason, Leifa Mayers

People of color experience racial discrimination on many levels, and such experiences are known to have a variety of different physical and emotional effects. Social media plays an important role in understanding the right and wrong ways of parenting. This project will analyze blog posts made by parents from different backgrounds, on social media sites, about racial socialization, the practice parents use to discuss race and racism with their children. An intersectional framework supports an examination of how racial socialization can be conceptualized across different races and genders. This allows for a better understanding of racial socialization by parents as a way to prepare their children to deal with bias in the world.

KIRKHOF CENTER GRR 122

Reactions of Dppm

Participants attending 12:00 PM - 1:00 PM

Presenters: Phillip Dietz, Pauline Mansour

Mentor: John Bender

The synthesis of asymmetrically oxidized derivatives of bis(diphenylphosphino)methane (dppm) have been investigated and characterized. The formation of Wittig-reagent-like compounds have also been attempted with dppm.

KIRKHOF CENTER GRR 123

Cause of Cyclicity Between Fossiliferous Limestones and Shales in the Upper Ordovician Kope Formation in Kentucky

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenters: Robert Allor, Grace Robinson, Matthew Strickler, Julia VanDam

Mentor: Peter Riemersma

What controls the cyclicity and the manner in which corpses of ancient life (fossils) accumulate in limestone beds of the Kope Formation is a controversial mystery. We will explore the debate as to whether storm winnowing or sediment starvation is the main mechanism of generating shell beds, and focus on the fossiliferous layers that are interbedded with shales in meter scale cycles. We will be reviewing the literature, and analyzing thin sections and hand samples of limestone to determine their environment of deposition. The viability of a particular model of limestone bed formation will be evaluated based on the condition of fossils and amount of fine-grained mud. The storm winnowing model will be evaluated based on the in-situ or broken condition of the fossils. The sediment starvation model will be evaluated based on the presence of "fairweather deposits".

KIRKHOF CENTER GRR 124

Wayfinding Abilities in Persons with Alzheimer's Disease: An Eye-Tracking Study

Participants attending 10:00 AM - 11:00 AM

Presenter: Sarah Moll

Mentor: Rebecca Davis

Wayfinding is the ability of individuals to find their way from one place to another. Individuals with Alzheimer's disease (AD) have a decline in wayfinding ability. In AD, visual attention deficits may affect the encoding and recall of routes. This study looked to determine differences in visual attention to pictorial cues and building features. A control group and AD group were tested in a virtual simulation of a long-term care environment. Subjects navigated to a destination over 10 trials, wearing eye tracking glasses to record visual fixations. Mean fixations were compared between the groups. The AD group had more fixations overall and on day two of testing than the control group. The AD group also had more fixations on building features on day two. Those with AD have more visual fixations and spend more time fixating on building features than those without AD. This population expends higher cognitive effort in wayfinding; thus measures of wayfinding support are needed.

KIRKHOF CENTER GRR 125

Histological Effects of Nonylphenol on Crayfish Gonads

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenters: Caroline Brereton, Samantha MacKay

Mentor: Daniel Bergman

Nonylphenol is a common surfactant used for domestic and industrial purposes, such as its incorporation into pesticides and detergents. It has also proven to have a high affinity for estrogen receptors, which could lead to feminization effects. Previous research demonstrated that after exposure to a sublethal concentration of nonylphenol for 12 consecutive weeks, juvenile male crayfish, *Orconectes propinquus*, experienced a decrease in their ability to find a mate. The gonad tissue of all the crayfish were fixated and then infiltrated with paraffin wax. A microtome was used to section the tissue samples and microscope slides were created using the thin tissue sections. A hematoxylin and eosin stain will be used to compare and contrast the histological sections of the gonad tissue. Differences will be noted to determine if various concentrations of nonylphenol has an impact on the histology of male and female gonad tissue.

KIRKHOF CENTER GRR 126

Influence of Type of Stretching on Muscular Endurance During Back Squats

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenters: Derrick Caver, Briana Franklin, Rose Jorden, Noah Stinson

Mentor: Ross Sherman

Stretching prior to exercise has been shown to improve flexibility, increase range of motion, and therefore muscle endurance. The aim of this study is to determine which stretching technique - static, ballistic, and Proprioceptive Neuromuscular Facilitation (PNF) - improves muscular endurance. Moderately active, healthy GVSU students participated in this study. There were four weeks of testing, with a five-minute walking warm-up on a treadmill before each session. A baseline 1-RM barbell back squat was determined to allow muscular endurance (repetitions to fatigue at 70% 1-RM) to be measured. Across the next three weeks, participants completed either ballistic, PNF, or static stretching, allocated in a randomized order, following the standardized five-minute warm up. Muscular endurance was measured immediately following each stretching protocol. Data will be presented at SSD.

KIRKHOF CENTER GRR 127

A Comparison of a Neolithic and Iron Age Population Using Vertebrae as a Non-Specific

Stress Indicator

Participants attending 2:00 PM - 3:00 PM

Presenter: Sam LoPresto

Mentor: Gwyn Madden

As one ages the experiences that they have and the tribulations they endure become encoded on an individual's osteology. These events can cause manifestations of non-specific stress indicators. More specially when an individual has stress occur in development it can affect the eventual growth of the transverse neural canal. Previous studies (Watts, 2011) have shown that mortality occurs towards those that have a smaller transverse neural diameter. Two different populations were used to compare different environmental influences and how these could affect the vertebra throughout life and development. A Neolithic sample from Verteba Cave, located in Western Ukraine, was compared with an Iron Age population from the United Kingdom. The results of this study show a significant difference in the neural canal size.

KIRKHOF CENTER GRR 128

Social Construction of Race & Housing Restrictions

Participants attending 4:00 PM - 5:00 PM

Presenter: De'Chelle Richards

Mentors: Julia Mason, Leifa Mayers

This research highlights the intersection of race and gender by analyzing Grand Rapids' climate surrounding housing restrictions in the 1920s. I wish to, then, explore the effect housing restrictions had on increased racial and social tensions, specifically housing discrimination. I argue that we can better compare differently oppressed groups by identifying macro-level patterns of inequality among groups, as well as macro-level patterns of systematic inequality. The "African American Collection" came to be at the center of my research. Dating back to Grand Rapids in the 1920s, there are maps, magazines, newspapers, and articles about zoning restrictions negatively impacting African Americans, furthering the divide of race, both geographically and socially. I found that this collection could give me an accurate depiction of the climate in Grand Rapids, surrounding housing discrimination, while also serving as a basis to compare our current climate.

KIRKHOF CENTER GRR 129

American Urban Agriculture: What Works Where and Why?

Participants attending 4:00 PM - 5:00 PM

Presenter: Katherine White

Mentor: Elena Lioubimtseva

The purpose of this project is to understand the growth of urban agriculture in the United States. Urban agriculture is defined as the use of any type of agriculture in an urban setting. I will analyze the top urban agriculture cities in the U.S. to see what types of agriculture are utilized in these cities and to what purpose they serve. These top urban farming cities are Detroit, Portland, Austin, Boston, Cleveland, Chicago, Seattle, Minneapolis, New York City, and San Francisco. The methodology will involve a review of literature on urban agriculture development in these cities. My goal is to determine different uses (economic, political, social or environmental) for these farming movements to generalize main reasons cities in the U.S. might integrate urban agriculture into their cityscape. This is important for future cities hoping to integrate agriculture into their zoning ordinances to see what urban agriculture works where and why it does function well there.

KIRKHOF CENTER GRR 130

Effects of Clothing Material on Body Temperature During Exercise

Participants attending 12:00 PM - 1:00 PM

Presenters: Renee Cloeter, Danielle Godair, Elizabeth Lozon

Mentor: Ross Sherman

Background: Body cooling during exercise relies on the rate of water evaporation which is dependent on air velocity and skin-clothing-ambient air vapor pressure gradients. The body core is the main site for cooling. Legs are the second most important site for cooling, especially while cycling. Purpose: The aim is to determine what pant clothing material gives the best thermoregulation for the body. Methods: 8 female students will complete three trials; trial one is control with shorts, two is pant material one and three is pant material 2. Begin by taking resting Heart Rate, Blood Pressure, Core Temperature and Body Weight and determine the subject's Age Predicted Max Heart Rate (APMHR). Place thermistors on thigh and calf and set up the polar heart rate monitor and watch. For each trial, the female will bike at 85% of their APMHR for 15 minutes while every 3 minutes Heart Rate, RPE, Thermal Sensation, Core Temperature and Thermistor Temperature is recorded. Results: Presented at SSD.

KIRKHOF CENTER GRR 131

Physiological Effects of Antioxidant Supplementation (Amla) on Aerobic Exercise

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenters: Rachel Mueller, Morgan Scollard, Victoria VanderPlas, Jacqueline Woods

Mentor: Ross Sherman

Background: To replenish total antioxidant concentrations when exposed to high oxidative stress, oral supplementation has been used as a preventative and non-invasive tool in reducing muscle fatigue and injury in athletes. Purpose: To analyze the effects of Amla (Indian Gooseberry) supplementation by measuring changes in physiological responses during and after a running performance test. Methods: Female long-distance runners participated in this study. Participants were randomly divided into Amla supplementation and placebo groups. Over the course of five weeks, there will be three testing phases using the Cooper test. The participants will perform baseline testing the first week and then again in each two week long experimental group. Measurements of HR, BP, oxygen uptake, RPE, max VO₂ and muscle soreness were taken before and after each exercise test. Muscle soreness was used as an indirect method of assessing muscle damage. Results: Data will be presented at SSD.

KIRKHOF CENTER GRR 132

Simulation of the UV-Vis Spectra of Nickel Pincer Halide Complexes

Participants attending 9:00 AM - 10:00 AM, 3:00 PM - 4:00 PM

Presenter: Trey Pankratz

Mentor: Richard Lord

This work looks at an NNN pincer-type ligand, coordinated to a nickel center, that was recently synthesized by the Lee group. This family of nickel complexes is of interest because in recent years they have gained the attention of the community for their utility in both catalytic bond activation and in polymerization. Our goal was to use the lens of computational modeling (TD-DFT) to supplement and help interpret experimental UV-vis spectra collected for a specific series of halogen coordinated nickel complexes and, more specifically, to try to help explain an unusual solvent-dependent coloration.

KIRKHOF CENTER GRR 133

Abnormal Growth Patterns of *P. patens* Mutant Phenotype May Be Due to Disrupted miRNAs

Participants attending 1:00 PM - 2:00 PM

Presenter: Andrew Freiman

Mentor: Margaret Dietrich

The moss *Physcomitrella patens* is a model species for studying plant development due to its simple developmental pattern relying on tip growth. In higher plants, tip growth is crucial for nutrient uptake and pollen tube growth. Our lab has an insertional mutant that shows several aberrant developmental phenotypes such as a severe lag in caulonema development and abnormal tip growth patterns when compared to the wild type. Furthermore, the wild type establishes new tip growth on the second subapical cell whereas, in our mutant, such growth initiates on the first subapical cell. These observations led our lab to examine regulatory elements at the disrupted genomic locus. Specifically, several miRNAs, that may play a role in regulating the pathways responsible for the changes in morphology, have been predicted to be produced from this locus. We are working towards transcriptome analysis through RNA sequencing to identify the gene networks affected by these putative miRNAs.

KIRKHOF CENTER GRR 134

Effect of a 2-week Strength Training Learning Intervention on Self-selected Weight Training Intensity

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenters: Sabrina Ahmad, Katarina Gaffka, Hannah Gove, Taylor Parmley

Mentor: Stephen Glass

Exercise intensity is often a difficult variable to prescribe in individuals, and in many cases exercisers self-select intensity based on their own effort perception. Past research has shown that self-selected resistance training intensity, which involves heavy loads and an effort to fatigue, are well below the appropriate stimulus. The purpose of this study was to provide subjects a 2 week period of resistance training in order to increase their self-selection intensity for resistance training. The learning group participated in 6 exercise sessions, blinded to load, encouraged to lift approximately 70% 1RM to fatigue. The control group completed 6 exercise sessions, selecting their preferred load. Subjects were not allowed to see the amount of load. Following training all subjects completed a self-selection trial and also a test to determine their maximal strength. Results to date will be discussed.

KIRKHOF CENTER GRR 136

Initial Analysis of Novel Soft Electron Donor Ligands for Potential Use in Nuclear Waste Remediation

Participants attending 2:00 PM - 3:00 PM

Presenter: Andrew LaDuca

Mentors: John Bender, Shannon Biros

As it stands, the remediation of nuclear waste is a problem. The waste contains a multitude of different lanthanides and actinides which are rare, expensive, and dangerous if not disposed of properly. One of the main uses of remediation is to recycle spent uranium to be used again in a reactor. The ligands currently in use for this process are not entirely selective, drawing up other metals as well; this is the main problem our group attempts to solve. From previous studies done by this group, it has been shown that actinides preferentially bond to softer electron

donors, while lanthanides prefer harder donors. The ligands shown in this poster were tested on transition metals first to see how they would react to soft or hard acceptor metals before moving on to more expensive f-block elements. We predict that these new ligands will be more effective in the selective extraction of actinides over lanthanides.

KIRKHOF CENTER GRR 137

Synthesis of Vinyl Silyl Anion

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenter: Jenna Seymour

Mentor: Randy Winchester

We are interested in synthesizing vinyl silyl anions to study resonance between silicon and carbon as well as to study the reactions of the silicon anions. In this project dimethylchlorosilane, a very sterically hindered silicon was used for making a new precursor to silicon anions. Dimethylchlorosilane was reacted with diethylamine, followed by lithium metal and trimethylsilylchloride. We will report on the reactions that we studied with GC-MS and H-NMR data as well as a crystal structure we obtained for one of the compounds we synthesized.

KIRKHOF CENTER GRR 138

Single Photon Detection and Coincidence Counting in the Undergraduate Laboratory

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenter: David Hill

Mentor: Douglas Furton

Most undergraduate physics students are familiar with the concept of the photon, but few ever have the opportunity to observe firsthand the quantum mechanical properties of light. The goal of this project was to create a robust experimental apparatus to bring experiments in quantum mechanics into the undergraduate experience. To that end, we have constructed a coincidence-counting module to measure the correlation between two beams of photons. The beams were generated via spontaneous parametric down-conversion, a process that uses a crystal to split a laser beam into streams of discrete photons. Our coincidence-counter measured the degree of second-order coherence between the beams, and was able to differentiate unambiguously between classical and quantum mechanical situations. By showing that the photon streams act quantum mechanically, we have shown that our apparatus operates correctly and is suited for experiments at the undergraduate level.

KIRKHOF CENTER GRR 139

Differences in Food Store Environment in Low-Income Grand Rapids Neighborhoods Composed of Different Ethnicities

Participants attending 4:00 PM - 5:00 PM

Presenter: Brenna Powers

Mentor: Deborah Lown

Populations that experience lack of access to healthy foods have a higher risk for developing nutrition-related illnesses. The purpose of this independent 499 study is to determine if there is a disparity in healthy food availability, food store environment, food quality and price between a low-income racially heterogeneous neighborhood and low-income Hispanic/Latino neighborhood in the Grand Rapids area. Data were collected on 8 different stores using the CX3 survey from California Department of Public Health. Epi Info will be used to enter and clean the data. Chi-square tests were used for discrete variables and Wilcoxin rank sum test for continuous variables on the

CX3 survey by store type in each neighborhood and between neighborhoods. I anticipate the findings will identify disparities in access to healthy foods by neighborhood. Highlighting the lack of access to healthy foods is the first step in finding a solution.

KIRKHOF CENTER GRR 140

Co-localization of Histamine and HDC Using the FLAG-HDC Transgene in *Drosophila melanogaster*

Participants attending 9:00 AM - 10:00 AM

Presenters: Jacob Howe, Lauren Robb, Brittany VandenBerg

Mentor: Martin Burg

Histamine has been shown to play an important role in various functions in *Drosophila melanogaster*, although the localization of its biosynthetic enzyme, histidine decarboxylase (HDC), has not been accomplished. To study the positional relationship between histamine and HDC, an epitope tag (FLAG) was inserted in-frame into the Hdc gene, creating the FLAG-HDC protein. In larval *Drosophila*, FLAG-HDC has been co-localized with histamine to ten pairs of histaminergic cells in the ventral nerve cord. We are examining newly stained preparations, using confocal microscopy, to investigate co-localization of histamine and HDC in larval and adult *Drosophila* whole-mount tissues. In adult *Drosophila*, this overlay of histamine and HDC has yet to be shown, whereas we are confirming previous findings of co-localization in larvae. These results will provide insight into the biology of histamine and HDC in the *Drosophila* model system.

KIRKHOF CENTER GRR 141

X-Ray Crystallography and Functional Studies for the Analysis of BshB and its Paralog Bca

Participants attending 10:00 AM - 11:00 AM

Presenter: Daniel Caylor

Mentor: Paul Cook

Bacillithiol (BSH) detoxifies reactive oxygen species in gram-positive bacteria and mediates fosfomycin resistance as a cofactor to the enzyme FosB. Produced from UDP-GlcNAc, BSH is synthesized from a pathway that includes the enzymes BshB and Bca. BshB is a deacetylase that converts GlcNAc-mal to GlcN-mal and Bca is a BshB paralog that primarily removes CysS-conjugated toxins from cells. Since the issue of antibiotic resistance is of high clinical relevance, our goal is to determine the structures and functional properties of BshB and Bca. To date, structures of BshB and Bca have not been published and valid kinetic parameters need to be determined. We used X-ray crystallography to determine the structures of these enzymes and developed a novel assay to test the kinetics of BshB and Bca. While the structures remain elusive, our assay proves the enzymes follow Michaelis-Menten kinetics. Ultimately, success in this study will help reduce the prevalence of fosfomycin resistance.

KIRKHOF CENTER GRR 142

Characterization of Putative *Salmonella* Pathogenicity Island in *Salmonella enterica* serovar Typhimurium

Participants attending 11:00 AM - 12:00 PM

Presenter: Rebecca Gordon

Mentor: M. Aaron Baxter

Salmonella enterica serovar Typhimurium is a foodborne pathogen responsible for localized gastroenteritis in humans and systemic typhoid in mice. After ingestion, the pathogen adheres and invades the epithelium of the distal small intestine. *Salmonella* uses complex regulatory mechanisms to determine where to adhere, invade, and colonize the host based on various environmental signals. These mechanisms are segregated into different areas of the genome. The regions responsible for regulation of mucosal epithelial tissue invasion is *Salmonella* Pathogenicity Island-1 (SPI-1); colonization and survival within macrophage utilizes SPI-2. In our studies, we identified a new region of the genome characterizing an SPI. To determine the roles of the genes in this area, we have created individual polar mutations within the operons. Current and future studies are determining the impact these mutations have on SPI-1 and SPI-2 expression, motility, invasion, adherence and macrophage survival.

KIRKHOF CENTER GRR 143

Investigation of Phosphine Ligands and Their Ability to Coordinate to Metals

Participants attending 3:00 PM - 4:00 PM

Presenter: Jackson Mort

Mentor: John Bender

1,1-Bis(diphenylphosphino)methane (dppm) is used to synthesize phosphorus ligand derivatives. Each ligand derivative consists of interchanging atoms between the chelation site which allows for new coordinations between metals that typically don't occur. With two phosphorus chelation sites, there are many derivatives possible which grant us the ability to try new coordinations to metals that haven't been successful in the past. Our results can be categorized mainly through P NMR spectroscopy for both their successful synthesization and coordination.

KIRKHOF CENTER GRR 144

Parental Beliefs and Perceptions Toward their Daughters Playing Tackle or Flag Football

Participants attending 1:00 PM - 2:00 PM

Presenter: Olivia Miller

Mentor: Christina Beaudoin

Over the past few years there has been a significant increase in female participation in the sport of football. Female tackle football leagues are emerging in several different states (GA, IN, MA, UT). Flag football is a sanctioned high school varsity sport in at least five states (FL, NV, AK, NY, Washington, DC). The purpose of this study is to examine the effects of different parental beliefs and intentions toward their daughters playing tackle or flag football. Using the Theory of Planned Behavior (TPB) as a framework, a survey will be created and sent to parents of daughters participating in football, through SurveyMonkey links. Questions related to TPB components, parental demographics, risk and benefit beliefs, safety concerns, behavior and cost of flag and tackle football will be examined. It is anticipated that our results will provide insight on parent perceptions, beliefs and intentions, risks and benefits, and support of their daughters playing tackle or flag football.

KIRKHOF CENTER GRR 145

Study of North American Food Deserts within the Midwest Regions: Present Factors and Sustainable Future

Participants attending 11:00 AM - 12:00 PM

Presenter: Amanda Pols

Mentor: Elena Lioubimtseva

Many places throughout the world have been confronted with the issue of food deserts. This is an urban area lacking access to affordable, nutritious and quality foods due to one's geographic living locations. The Midwestern region of the United States is an area which particularly has shown itself as a section with several food desert locations. This study investigates, by academic literature reviews, the factors within Midwest locations that create these nutrient barren areas as well as looking at examples for sustainable future land planning ideas. The outside elements that make up and contribute to these areas allows for researchers to see where the problems initially start. The intended results of this research are to address the problems food deserts pose as well as examining proposed sustainable solutions. Research in this area will help broaden education about the existence of food deserts as well as get action plans moving forward in an effort to eliminate them.

KIRKHOF CENTER GRR 146

Effects of Sodium Bicarbonate on Lactate Production

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenters: Marie Bourke, Olivia Miller, Linda Palazzolo, William White

Mentor: Kimbo Yee

Background: The accumulation of lactate during exercise can negatively affect performance. The ingestion of sodium bicarbonate may be able to reduce this negative effect. Purpose: Examine if the acute ingestion of sodium bicarbonate can improve lactate threshold during a leg cycle exercise test. Methods: Using a randomized, crossover study design, 8 participants participated in two leg cycle exercise tests one week apart. A graded exercise test protocol of increasing intensity across 3-minute-long stages was used for the test. Each week the participants were randomly assigned to sodium bicarbonate or a placebo supplement. Blood lactate was measured at the end of every stage. Results: There were no significant differences in blood lactate across any of the stages during the exercise test between the sodium bicarbonate and placebo condition. Conclusion: An acute ingestion of sodium bicarbonate did not improve lactate threshold during a leg cycle exercise test.

KIRKHOF CENTER GRR 147

Effects of Beetroot Juice on Anaerobic Performance

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenters: Samantha Avgerinos, Rachel Chester, Casey Hook, Kayla Quinlan

Mentor: Amy Gyorkos

Nitric oxide has been shown to be beneficial for cardiovascular health by vasodilating blood vessels, lowering blood pressure and improving performance. Beetroot juice contains the precursor to nitric oxide (dietary nitrates) in abundance. The aim of this study is to assess the effects of beetroot juice supplementation on anaerobic exercise performance and blood lactate during the Wingate Test. Subjects will be randomly assigned to beetroot or no beetroot juice consumption. Subjects will either consume 70 mL/day of beetroot juice or water for six consecutive days prior to testing. On testing day, subjects will come to the lab hydrated with or without beetroot juice consumption two hours prior to the anaerobic 30-sec Wingate test. Peak blood lactate levels will be measured by fingerstick at time 0, 30s, and every 3min until peak following the completion of the Wingate test. Data is currently being collected.

KIRKHOF CENTER GRR 148

Effects of Stretching on Muscular Strength

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00

PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM

Presenters: Lindsay Davis, Benjamin Lange, Megan Shaughnessy, Allison Stears

Mentor: Amy Gyorkos

Background: Stretching before any type of exercise is known to prevent injury and improve flexibility; the effect of static and dynamic stretching on muscle strength is not well known. Purpose: The purpose of this study is to examine the effectiveness of dynamic and static stretching on muscle strength when performing a one repetition-maximum chest and leg press. Methods: Five subjects were randomly assigned to complete both a static and dynamic trial. Each trial included an 8-minute warm-up, consisting of 8 different stretches prior to performing a 1-RM chest and leg press. A control group performed 1-RM testing with no prior stretching. Testing protocol was followed by the American Council on Exercise Personal Trainer Manual for predicted and actual 1-RM assessments. 1-RM data were collected in 3-5 attempts by progressively increasing resistance after each successful attempt until failure. Results and Conclusions: Data collection is ongoing.

KIRKHOF CENTER GRR 149

Key Performance Indicators for the 2016 World Series Champion Chicago Cubs

Participants attending 11:00 AM - 12:00 PM

Presenters: Cort Musolf, Daniel Prego

Mentor: Ross Sherman

Background: In baseball, there are many key performance indicators (KPIs) to consider when measuring a team's success. Based on prior research, batting average and on base percentage (OBP) are offensive KPIs, whereas fielding percentage, earned run average (ERA), ball-to-strike ratio and walks plus hits per inning pitched (WHIP) are defensive KPIs. Purpose: The purpose of this study is to gain a further understanding on which KPI's are most effective in determining the variation of outcomes. Methods: An analysis of the Chicago Cubs from their 2016 season will be performed using game data obtained from the MLB database. It will also be determined which KPIs affect game performance, i.e. which KPI increases the changes most/winning by 3 runs or more). Using appropriate statistical software, trends were assessed and determined in respect to prior research. Results: The results of the study will be presented at Student Scholars Day.

KIRKHOF CENTER GRR 150

Effects of HITT Training on Memory

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM

Presenters: Joseph Dolley, Jarren Guy, Anaya Lechnar, Kendrick Oss

Mentor: Amy Gyorkos

High intensity interval training has been shown to have positive effects on the body. However, its effects on memory and cognition are not widely studied. The purpose of the study is to examine the effects of high intensity interval training on memory and cognition. The subjects will be randomly assigned to a control group and to an intervention group in which the client will perform a memory test before and after a high intensity interval training (HIIT) workout. HIIT protocol will include 10 sprints with 1 minute of light pedaling between sprints for 20 total minutes. Memory and cognition will be assessed using SLUMS examination before and after HIIT training. The subjects will be familiarized with the memory tests and the HIIT workout before the data collection will begin. Data collection is currently ongoing.

KIRKHOF CENTER GRR 151

Association Between Relief Index of Second Mandibular Molars and Diet Across Mammals of the Mindanao, Philippines Community

Participants attending 9:00 AM - 10:00 AM

Presenters: Isaac Brace, Siera Ramirez, Zakary Riebschleger

Mentor: Laura Stroik

Molar topography varies across mammalian species and dietary regimes. Quantitatively distinguishing among diets such as frugivory, folivory, omnivory, and insectivory would allow distinguishing among diets such as frugivory, folivory, omnivory, and insectivory would allow further understanding of extinct and extant taxa. Specifically, relief index (RFI), a measure of dental topography, is expected to be associated with diet. Several previous studies focused on primates and other euarchontans, but the current research examined RFI across chiropteran, dermopteran, insectivoran, primate, scandentian, and rodent second molars (N=130) to expand the taxonomic breadth of the study of RFI. Using discriminant analysis, this study determined that RFI predicts diet (~90% success rate) across this broader sample, suggesting that RFI can be used to reconstruct diet in a variety of mammal species.

KIRKHOF CENTER GRR 152

Effects of a Dynamic Warm Up vs. Weighted Box Jump Warm Up on Vertical Jump Performance

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenters: Jordan Juzwiak, Olivia Keeley, Breanna Kern, Darcie Shaw

Mentor: Amy Gyorkos

Athletes around the world acquire skills through practice. Ability to enhance power on the vertical jump can make major differences in athletic performance. The purpose of this study is to compare the acute effects of power using dynamic warm up and a weighted jump warm up on vertical jump performance. Four regularly active female college-aged participants were tested weekly in three different conditions in a randomized order. Each session starts with a five minute cycle warm up at 50 RPMs, followed by the intervention. The warm-up conditions include: (a) control, (b) dynamic warm up, and (c) weighted jump warm up followed by a 2 minute rest. Each subject completed 3 max vertical jumps using the Vertec at times 0,5,10, and 15 minutes. The max height at each times will be recorded and used for power determination ($\text{power (Watts)} = 41.4 \cdot \text{Vertical jump (cm)} + 31.2 \cdot \text{mass (kg)} - 13.9 \cdot \text{height (cm)} + 431$). Data are currently being collected and analyzed.

KIRKHOF CENTER GRR 153

Localization of the Filamentation-Associated Protein Encoded by *Orf 19.2302* in *C. albicans*

Participants attending 10:00 AM - 11:00 AM

Presenter: Andrew Carlson

Mentor: Ian Cleary

Cell morphology plays a vital role in pathogenesis of the fungus *Candida albicans*. An uncharacterized gene expressed in filaments, *orf19.2302*, is predicted to encode an ER membrane protein with no known homologues outside of *C. dubliniensis*. To better understand this protein, we transformed a mCherry tagged *orf19.2302* gene into

the wild type strain of *C. albicans* to determine the localization of the protein within the cell. The protein was studied by fluorescent microscopy to determine its localization. We are using a fluorescently tagged version of a known ER protein as a control. Similarities to a *Saccharomyces* protein in the same family predict that this protein may play a role in Ca^{2+} transport. Growth under conditions of Ca^{2+} stress has shown increased adhesion in hyphae. From further investigation we hope to gain a better understanding of *orf19.2302* and the role that the encoded protein plays in the morphological changes observed in *C. albicans*.

KIRKHOF CENTER GRR 154

Structural and Functional Characterization of Fragment-based Inhibitors for OXA-24, an Antibiotic Resistance Enzyme

Participants attending 11:00 AM - 12:00 PM

Presenter: Uyen Pham

Mentor: Rachel Powers

Although beta-lactams have been the most prescribed antibiotics due to their effectiveness, several defense mechanisms have emerged to counteract the activity of beta-lactam antibiotics. The most concerning is the production of beta-lactamase enzymes that hydrolyze the amide bond in the four-membered beta-lactam ring. One way to overcome resistance is by identifying novel inhibitors that do not share a lactam ring. Previous work in the lab used the program DOCK to identify lead fragment molecule NK3, which showed inhibition of OXA-24 beta-lactamase. Of the analogs of NK3 tested in kinetic assays, a few showed improved binding affinity to OXA-24. To better understand the structural basis for this improved affinity, OXA-24 was crystallized, and structures of OXA-24 in complex with the analogs were obtained using X-ray crystallography. With further optimization, NK3 fragments can become a new series of class D beta-lactamase inhibitors unaffected by current resistance mechanisms.

KIRKHOF CENTER GRR 155

Using LIDAR and DEMs to Investigate Groundwater Springs and Possible Sapping Valleys in Western Michigan

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM

Presenters: Ross Helmer, Eleanore Larson

Mentor: Peter Wampler

We propose to investigate the structure of groundwater springs and possible sapping valleys along Pigeon River in Ottawa County, Michigan. *Sapping valleys* are valleys eroded by springs and their streams. Our preliminary field research indicates that springs and amphitheater shaped valleys are common features along the Pigeon River. Hemlock Crossing County Park contains numerous springs where sapping appears to erode dune sediments forming small valleys with the signature amphitheater shape of previously documented sapping valleys (Dunne, 1980). This amphitheater shape is distinct because most valleys erode in a straight v-shape. We plan to use ArcMap GIS to interpolate LIDAR data into a continuous digital elevation model (DEM). We will compare this DEM to DEMs of known sapping valleys and traditional valleys. This will allow us to use contour lines and GIS analysis to differentiate sapping valleys from traditional valleys.

KIRKHOF CENTER GRR 156

Developing ArcGIS Spatial Analysis Methods for Mapping the Distribution, Form, and Areal Coverage of Inland Dunes Across West Michigan

Participants attending 2:00 PM - 3:00 PM

Presenter: Taylor Weeden

Mentor: Peter Wampler

Significant areas of western Michigan are covered by small, vegetated relict dunes inland from Lake Michigan. Current surficial geology maps of Michigan fail to include these inland dunes and greatly underestimate their areal coverage. Maps including data on these dunes are needed in order to provide critical information for scientists studying issues related to groundwater, ecology, and surface water. Using ArcGIS, I will develop a method for determining areal coverage, distribution, and form of these relict dunes located in Ottawa County in order to reconstruct paleowind direction at the time of their formation. I will use digital elevation models (DEMs) and satellite imagery, along with LiDAR (light detection and ranging) data provided by Ottawa County to create detailed maps outlining the dune crests and form. With this data, I will create maps of these reconstructed dunes in order to improve our knowledge of Michigan surficial geology and the interesting history of these dunes.

KIRKHOF CENTER GRR 157

What Did Columbus Leave Behind? : Using GIS to Locate Archaeological Sites on Haiti's Northern Coast.

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM

Presenters: Trevor Pickett, Nicholas Priehs

Mentor: Peter Wampler

We will be using ArcMap GIS and spatial analysis, combined with written accounts from Columbus, to locate the lost city of Navidad and remains of the Santa Maria on the Northern coast of Haiti. Navidad was a city settled by Christopher Columbus, mentioned in his logs during his infamous voyage of 1492. Using GIS, historic maps drafted during the exploration period, and geographic references, maps will be georeferenced to a modern-day spatial reference system. These maps will be overlain on modern aerial photos available in Google Earth to explore the most likely settlement sites and what features surrounded it. In addition to locating Navidad, we are going to try to locate the remains of Columbus' famous vessel the Santa Maria. We will be utilizing the same logs and maps to locate the Santa Maria, with the addition of geologic interpretation of the coastal evolution of the shoreline of Northern Haiti.

KIRKHOF CENTER GRR 158

Modeling Long-term Genetic Diversity of *Myotis lucifugus* Populations after Infection by White-nose Syndrome

Participants attending 11:00 AM - 12:00 PM

Presenter: Erika Forest

Mentor: Amy Russell

The little brown bat, *Myotis lucifugus*, is one of many North American bat species showing population declines due to white-nose syndrome (WNS), a fungal disease affecting hibernating bats. WNS has led to population declines of up to 99% in some colonies. However, population viability studies have predicted improving survival rates and possible evolutionary rescue of *M. lucifugus* populations due to hypothesized WNS resistance. We modeled a simple forward-in-time simulation of *M. lucifugus* populations. Populations with WNS resistance were simulated under levels of population decline observed in WNS-infected *M. lucifugus* populations in order to examine the resulting change in genetic diversity. Tracked changes in allele frequency allow for a prediction of the long-term

impact of the current declines caused by WNS on population genetic diversity. This presentation will provide an evaluation of the impact of WNS syndrome on genetic diversity in *M. lucifugus* populations.

KIRKHOF CENTER GRR 159

Investigation into Excitations and Suppressions of Spectral Data from Microplasma Created from High Frequency Breakdowns.

Participants attending 9:00 AM - 10:00 AM

Presenter: Matthew Underhill

Mentor: Geoffrey Lenters

Instances of dielectric breakdown have been observed in lightning strikes ever since humans first experienced thunderstorms; however, they were not formally studied until Friedrich Paschen published results in on high-voltage DC discharges. He observed characteristic curves of breakdown voltage as a function of the product of pressure and gap size, with a well-defined minimum breakdown voltage. More recently, microwave-induced plasma discharges have been observed to follow a modified version of Paschen's model. In order to better understand these results we observed the spectrum of the Argon plasma generated in a microgap (on the order of 10 microns). We analyzed the intensity ratios of the spectral bands at designated wavelengths with the immediate goal of identifying a correlation in the spectrum with gap size and pressure. We hope to extend the results of this work toward measuring the plasma parameters such as electron temperature and density in future experiments.

KIRKHOF CENTER GRR 160

Genesis Of Meter-Scale Cyclical Shell-Rich Beds in the Upper Ordovician Fairview Formation, Kentucky

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenters: Danielle DeWeerd, Jared Eslick, Vincent Hrynyak, Lindsay Knauber

Mentor: Peter Riemersma

Many locations around the world show the presence of cycles, such as the banded iron formations of Western Australia to glacial varve deposits in northern Vermont. We will be investigating the successions of meter-scale beds containing a shelly limestone-dominated phase and a mudstone-dominated phase in the Upper Ordovician. Our focus will be on the conditions under which the shell-rich limestone layers were deposited in the Fairview Formation. There are many contradicting theories proposing different environments of deposition that range from episodes of sediment starvation to recurrent changes in sea-level, as well as alternating periods of extreme weather. To differentiate between these different mechanisms, literature reviews, field analysis, and examinations of hand samples and thin-sections from a Fairview outcrop will be conducted.

KIRKHOF CENTER GRR 161

Wolverine Worldwide: Lessons Learned

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 3:00 PM - 4:00 PM

Presenters: Andi Kares, Aaron Nelson

Mentors: Elena Lioubimtseva, Wanxiao Sun

Wolverine Worldwide is a shoe company located in Rockford, MI. In the last year there have been multiple dumpsites found in Kent county that are linked to Wolverine Worldwide. These dumpsites are the location of tannery waste barrels which hold high levels of PFOS and PFOA – chemicals linked to many health issues in

people. The barrel waste has been seeping into private residential wells since the early 1960's, causing deaths from cancer and other health issues in the impacted areas. This has caused many to question the water systems serving the people of Kent County. Through our research we were able to pinpoint the multiple dumpsite locations. Using ArcMap we then presented a visual of the dumpsite locations. In addition, we have also been able to match the toxicity levels of known dumpsites to their respective locations on the map we created. This research allows for simplified presentation of toxicity data, and dumpsite locations.

KIRKHOF CENTER GRR 162

Possible Liquefaction Mechanisms in the Genesis and Distribution of Ball-and-pillow Structures Throughout the Late Ordovician Fairview Formation, Kentucky

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM

Presenters: Emily Bergel, Claire Kinne, Taylor Weeden, Brooke Yaffa

Mentor: Peter Riemersma

Possible explanations behind the formation of ball-and-pillow structures found throughout the Fairview Formation in Kentucky include seismic-induced, load-induced, and storm induced soft sediment deformation. This deformation is seen as rounded masses detached from the upper coarser-grained layer, sinking into the underlying fine mud. The Fairview Formation was deposited over 444 million years ago and consists of alternating shale and coarser grained beds. Not all beds contain ball-and-pillow structures, indicating possible episodic formation events. Hand samples and thin sections of both deformed and undeformed surrounding rock will be examined. Theories and criteria from the literature, such as Sim's criteria for determining seismic history, will help us differentiate between deformation processes due solely to load-induced density instability, or if liquefaction was involved.

KIRKHOF CENTER GRR 163

Polyomino Number Theory

Participants attending 11:00 AM - 12:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM

Presenters: Ashten Griswold, Ellen Grove, Emily Machniak, Anna Shier, Maia Wichman, Katherine Yats

Mentors: David Clark, Lauren Keough

Polyominoes are two-dimensional shapes that are constructed by joining unit squares, called monominoes, edge to edge. Consequently, polyominoes are defined by both their size as well as their shape. For example, a polyomino comprised of three unit squares is called a tromino and can be constructed in two ways: in the shape of the letter 'I' or in the shape of the letter 'L'. We explore how the concepts of *divisor*, *relatively prime*, *multiple*, and *common multiple* can be extended from integers to polyominoes. Furthermore, we will develop and experiment with new proof techniques that will allow us to verify properties pertaining to polyominoes. In doing so, we will draw parallels between the polyomino number system and the integers as well as explore the limitations of these comparisons.

KIRKHOF CENTER GRR 164

Effects of Tart Cherry Concentrate on Resting and Exercise Blood Pressure

Participants attending 10:00 AM - 11:00 AM

Presenters: Taylor Baker, Haley Brkic, Heather McDaniels

Mentor: Kyle Barnes

The rate of hypertension in America has significantly increased. Because of this, we must explore new ways to help prevent this issue. Previous research has shown high doses (>10 oz) of tart cherry juice concentrate (TCC) reduces

arterial pressure, inflammation and subsequently blood pressure, however, the effects of low doses of TCC are unknown. A between-subjects repeated measures study design was used to assess the effects of Montmorency TCC on resting and exercising blood pressure. 10 healthy college aged adults were given either 1 oz (n = 5) or 2 oz (n = 5) of cherry concentrate per day for 14 days. At baseline, day 7 and 14 their resting and exercising blood pressures were assessed using a standard bike test consisting of exercising for 10 min at 60 RPMs with 1.5 kg resistance. Data collection is currently ongoing and results will be presented at Student Scholars Day.

Oral Presentations, Abstracts & Schedule

Beginning at 9:00 AM

KIRKHOF CENTER 1104

Maximizing Songbird Habitat in a West Michigan Housing Project

Presenter: Benjamin Van Dam

Mentor: Carol Griffin

The purpose of this project is to modify a proposed housing project on an abandoned golf course in downtown Hudsonville, Michigan to create suitable habitat for common song birds. Inventory and assessment of key habitat variables before and after construction is vital in promoting suitable habitat. Instead of managing for a single species, habitat suitability indexes will identify the basic habitat components to support a diverse community of songbirds. To create suitable foraging, nesting, and display sites habitat requirements such as diverse trees, shrubs, and bushes must be established along with the construction of a pond. After analyzing the proposed housing development and habitat variables, the two components will work together to formulate a management plan that allows development while creating songbird habitat.

KIRKHOF CENTER 1142

Therapeutic Recreation Interventions for the Sandwich Generation

Presenters: Lea Caruso, Avery Grant, McKensey Heys, Kaitlyn Mulvey, Christine Roudebush

Mentor: Dawn De Vries

This presentation will explore the issues related to the 'Sandwich Generation.' Recreational therapy interventions will be explored to improve quality of life and reduce stressors.

KIRKHOF CENTER 2259

Evaluating the Effects of Mindfulness-Based Interventions on Undergraduate Nursing Students' Mental Health: A Systematic Review

Presenter: Erin Sartorius

Mentor: Genevieve Elrod

Undergraduate nursing students endure unique stressors that impose negative consequences on their mental health. The purpose of this systematic review is to assess available research regarding the effectiveness of mindfulness-based interventions on the mental health symptoms of undergraduate nursing students. Three databases were searched for peer-reviewed research studies with an intervention rooted in mindfulness that yielded mental health outcomes for nursing students enrolled in a 4-year nursing program. Of the 74 articles found within the database search and 14 hand-picked articles, seven studies met the inclusion criteria. Overall, these studies indicated that mindfulness interventions significantly decreased negative mental health symptoms in nursing students, though more randomized controlled trials with sufficient power must be conducted. Employing mindfulness-based interventions in the Kirkhof College of Nursing could benefit undergraduate nursing students.

KIRKHOF CENTER 2266

MicroRNA 34b/c and Alpha Synuclein Gene Expression in SH-SY5Y Cells for Parkinson's

Disease Study

Presenter: Emma Hahs

Mentor: Sok Kean Khoo

Parkinson's disease (PD) is the second most common neurodegenerative disorder, with a pathological hallmark of alpha synuclein (aSyn) protein inclusions in the midbrain. Developing new drug therapies that block aSyn aggregation could slow disease progression. MicroRNAs (miRNAs) are small RNAs that bind to messenger RNA regulating gene expression. miRNA-34b and 34c are predicted aSyn targets and shown to be down-regulated in PD brains. Here, we aim to establish a cell model to study the effects of miRNAs on aSyn aggregation. Our hypothesis is that miRNA-34b/c gene expression will be down-regulated with aSyn gene expression up-regulated. Using quantitative real-time PCR to measure gene expression, we found miR-34b/c expression down-regulated in rotenone treated SH-SY5Y cells. However, aSyn gene expression was not up-regulated in treated cells, which is unexpected. Next, we hope to measure aSyn protein expression to determine SH-SY5Y as a viable cell model for studying PD drug therapies.

KIRKHOF CENTER 2270

Similar Crime, Different Color: A Look at Race, the Death Penalty, Childhood-Past & Clemency Reports

Presenter: Dashay Berry-Purnell

Mentor: Jaclyn Cwick

Researchers have long known that racism plagues the death penalty. However, little research has been done on how race matters in the context of death penalty appeals. This study seeks to fill that gap by qualitatively analyzing clemency reports issued for Black and White offenders sentenced to death. Specifically, I explored how race was communicated in the findings of the clemency boards. I found that clemency reports mentioned the significance of one's childhood past much more commonly for Black offenders than Whites. Moreover, when a Black offender's upbringing was discussed, reports used coded racism, drawing heavily from problematic ideologies of the "pathological" Black family, plus coded racism in turns equal a cycle of institutional racism. The contribution of this study is to show yet another way in which the cycle of institutional racism is perpetuated in capital punishment, thus providing a stronger case for the abolishment of the death penalty.

Beginning at 9:30 AM

KIRKHOF CENTER 1104

Comparing Camping Restrictions of Six Wilderness Areas by Spatial Analysis

Presenter: Graeme Breems

Mentor: Carol Griffin

The percentages of land where camping is off-limits due to setback restrictions in six wilderness areas within U.S. National Forest (USFS) land are compared. The wilderness areas included in the study are Jedediah Smith, Fitzpatrick, Holy Cross, South San Juan, Sky Lakes, and Carson-Iceberg. These similar-sized wildernesses represent the Intermountain, Rocky Mountain, Pacific Northwest, and Pacific Southwest USFS regions. Camping setback restriction data for each site from the USFS is spatially analyzed using GIS. I expect to find that wilderness areas containing more trails and bodies of water will have higher percentages of restricted camping area. These findings would imply that unconfined recreation in wilderness areas becomes more confined as

established trails and recreation opportunities associated with water increase.

KIRKHOF CENTER 1142

Sex Trafficking and Therapeutic Recreation Interventions

Presenters: Megan Chant, Brittany Daugherty, Emma Green, Anna Laughter, Rachel Trulock

Mentor: Dawn De Vries

This presentation will explore adolescents who have been victims of sex trafficking in the United States. Recreational Therapy interventions will be examined involving coping mechanisms, healthy relationship building and self-esteem.

KIRKHOF CENTER 2259

Privileged and Complicit: Education and Understanding of White Privilege at a Predominantly White Institution

Presenter: Chase Dolan

Mentor: Mary Bair

As a predominantly-white institution, Grand Valley State University (GVSU) students commonly come from racially homogenous backgrounds and may never have had to think about their racial identity or racial issues. These students, who arrive at institutions of higher education unaware of their white privilege or the racial oppression that results from this privilege, cannot be expected to engage meaningfully in any discussion about racial injustice. A qualitative study was conducted using a sample of students at GVSU to determine their level of education and understanding of white privilege. The purpose of this study was to examine the students' perception of their understanding about the concept of privilege, the effectiveness of education about privilege at this institution, and comfort in racial dialogue. Using these results, the study hopes to provide educators with strategies to improve white privilege education after white students are confronted with the idea.

KIRKHOF CENTER 2266

The Impact of Activist Intent on Archival Curation

Presenter: Ruth Ott

Mentors: Julia Mason, Leifa Mayers

This research will provide insight into challenges that shape archival and academic knowledge of the histories and cultures of the LGBT community. The project will use first-hand accounts from archivists to uncover the perceptions of archivists who work specifically with LGBT materials in order to determine challenges and opportunities inherent in LGBT archival work. This project is guided by an intersectional framework that allows for analysis of the ways in which social and bureaucratic forces impact how archivists interact with LGBT-specific materials. The findings of the project will be significant to the field of gender studies because it informs the ways in which knowledge pertaining to the LGBT community is curated and maintained.

KIRKHOF CENTER 2270

An Analysis of the Factors Contributing to High Rates of HIV Diagnosis in the Southern United States

Presenter: Sabrina Williams

Mentor: Jae Basiliere

According to the CDC, 43% of people living with HIV in the U.S. live in the Southern region of the country. Of those people living with HIV, African Americans are the most affected group. The stigma that has surrounded HIV since the early 1980s is the root cause of many of the factors contributing to the high rate of HIV in the region. Discrimination against minority groups living in the South has led to a distrust of health care providers, a lack of communication about how to prevent the disease, and far too few clinics providing treatment and testing for HIV. The rural and urban divide, along with high rates of poverty in the region are also contributing factors. Fear that is brought on by social stigma has dissuaded many people from getting tested, putting them at risk for developing AIDS and contributing to the spread of the disease. In order to eradicate HIV in the South, the social barriers preventing people from getting preventative health care need to be addressed.

Beginning at 10:00 AM

KIRKHOF CENTER 1104

A Comparative Analysis of the Presence of Campfire Rules in Forest Service Wilderness Areas

Presenter: Alexa Wasielewski

Mentor: Carol Griffin

The purpose of this research is to determine if the size, state, and year of wilderness designation play significant roles in the presence of campfire rules. This research will conduct analyses to determine which factors result in a higher likelihood of wilderness areas having campfire regulations. I expect to find the most obvious relationship between the state in which the wilderness exists, which likely has implications as to a wet or dry climate, and the presence of rules, with rules occurring more frequently in wilderness areas considered to be dry rather than wet. I expect to see the presence of rules more frequently in smaller, rather than larger wildernesses, because campfires in a smaller wilderness could have a more negative effect on other recreationalists seeking solitude. Because of increasing ecological and social awareness surrounding wilderness recreation, I expect to see the presence of rules more frequently in newer, rather than older, wildernesses.

KIRKHOF CENTER 1142

Older Adults and Children: Exploring Intergenerational Programming

Presenters: Ashton Burt, Sadie Makuch, Margaret Norris, Angela Thweni, Savannah Warner

Mentor: Dawn De Vries

This presentation will explore the positive health benefits for older adults involved in intergenerational programming with children.

KIRKHOF CENTER 2259

Building Worlds: An In-depth Look at Worldbuilding in Fiction

Presenters: Alena Kenyon, Jordan Sickrey

Mentor: Christopher Haven

Every story must build a world. That is how readers are able to understand the story. Whether this world is brand new or built in our own, worldbuilding is the key to the life of a story. The purpose of this study is to identify ways that worldbuilding is categorized. We look at several published novels to analyze worldbuilding technique, and these novels cover a variety of genres and reading levels. We were able to identify eight worldbuilding categories: 1)

Character, 2) Not of this World, 3) Knowledge, 4) Dialogue—Terms, 5) Dialogue—Characters, 6) Dialogue—History, 7) Direct Acknowledgement, and 8) Indirect Acknowledgement. We will look at these categories further to help develop a new understanding of how worldbuilding works.

KIRKHOF CENTER 2266

Investigation into the Cellular Levels and Brain Distribution of the GAP-43 Protein in Association with Learning and Memory Deficits in Alzheimer's Disease

Presenter: Michael Hudson

Mentor: John Capodilupo

Alzheimer's disease is a neurodegenerative disorder marked by cognitive and behavioral impairment that drastically interferes with occupational and general functioning. Although vast research into β -Amyloid plaques and neurofibrillary tangles has been conducted, the primary pathogenic factor of Alzheimer's disease, neuronal death and synaptic dysfunction, is often overlooked. The growth associated protein GAP-43 appears to facilitate neuronal pathfinding and branching during development and regeneration. It has been shown that GAP-43 may contribute to presynaptic changes that positively induce neurotransmitter release, memory formation, and learning. Biomarkers like GAP-43 have the potential to serve as identifiers for the restoration of a patient's normal cognitive function. This project seeks to identify changes in GAP-43 isoform levels when comparing normal brains and Alzheimer's disease brains through the use of proteomics, immunohistochemistry, and electrophoretic separation.

KIRKHOF CENTER 2270

Referential Spatialization and Collaborative Communication in Virtual Space

Presenter: Alexander Norris

Mentor: Michael Wroblewski

Non-verbal communication is an integral part of everyday communication. However, in ever-growing, online gaming communities worldwide, non-verbal communication is severely restricted, rendering many tasks complex and difficult. I examine the ways a specific community of gamers implement in-game tools in communicative practices. Of particular interest is how players use these tools to spatialize objects/places of interest in relation to players' in-game avatars. This study consists of video- and audio-recordings of conversational data between eleven members of the Xbox Live community. I argue that the number call-outs used by players with the help of an in-game compass act as unique verbal gestures. The number call-outs act as both deictic gestures, pointing to whatever a speaker finds relevant, and as regulatory gestures used to control and coordinate interaction. In using these numbers, players are able to more articulately communicate and spatialize themselves in virtual space.

Beginning at 10:30 AM

KIRKHOF CENTER 1104

A Restoration Plan for the Highlands Natural Area

Presenter: Benjamin Lachman

Mentor: Carol Griffin

Ecological restoration is the practice of renewing a damaged or degraded ecosystem through active human intervention. The Highlands Natural Area, a former golf course, is a monoculture of turf grass. Blandford Nature Center and the Land Conservancy of West Michigan want to restore the Highlands and I have designed a

restoration plan that will increase biodiversity by reestablishing native species and natural processes. Through site analysis performed on two healthy reference ecosystems, I have established a target for both a mesic southern forest and an oak savannah within the Highlands. These reference sites will act as templates for the composition of the vegetation chosen when restoring the Highlands. Construction of a wetland ecosystem has also been initiated by the new land owners, and will be included in the restoration. The restoration plan will assess the logistics and costs of prescribed burns, seeding and transplanting, and the wetland excavation.

KIRKHOF CENTER 1142

Cultural Competency in Therapeutic Recreation

Presenters: Amy Anderson, Taylor Bass, Emily Mannor

Mentor: Dawn De Vries

This presentation will explore the importance of cultural competency in therapeutic recreation in minority populations.

KIRKHOF CENTER 2259

“All Autocratic Regimes Come to an End?” Explaining Regime Stability in Russia

Presenter: Bryce Hecht

Mentor: Heather Tafel

Since his return to the presidency in 2012, Russian President Vladimir Putin has governed amidst poor economic conditions. Despite this, Putin’s regime has remained intact. In this paper, I aim to provide an explanation for this phenomenon. I argue that in response to these conditions, the regime has taken new steps to legitimize itself and, in turn, build popular support and prevent elite defections. First, it has cast the blame for Russia’s economic situation on sanctions levied by Western governments in response to the country’s 2014 annexation of Ukraine’s Crimean territory, resulting in the proliferation of anti-Western sentiment. Second, it has framed Putin as a protective barrier against these external forces, resulting in an increase in his own approval rating. In light of this popular sentiment, the regime has weakened key venues of elite defection and mass anti-regime mobilization, namely the country’s regional governorships and independent technology platforms.

KIRKHOF CENTER 2266

Policies and Practices of Affirmative Consent Surrounding American College Students

Presenter: Sean Foster

Mentors: Sarah King, Leifa Mayers, Marilyn Preston

In America the topic of sexual consent or lack thereof on college and university campuses has become a prominent issue. Recent studies have shown that students are more likely to engage in nonverbal communication in regards to sexual consent, leaving room for ambiguous and sometimes unwanted advances. There are three main goals of this presentation. The first is to examine the sexual practices of an American college student. The second goal is to determine their comprehension of affirmative consent when engaging in sexual practices. Finally, a curriculum will be developed to instruct students in being active and verbal in their consent practices as it relates to sexual activities. This will be done by examining and evaluating pre-existing policies and established curricula from California law, Planned Parenthood education tools, and news media outlets.

Beginning at 11:00 AM

KIRKHOF CENTER 1104

Ecological Impacts and Implications of Pansteatitis in South Africa's Nile Crocodiles

Presenter: Rebecca Hippensteel

Mentor: Carol Griffin

The purpose of this research is to examine the causes and implications of pansteatitis in South Africa's Nile crocodiles, as well as determine the ecological impacts of crocodile mortality and ascertain whether the disease's sources can be controlled. To determine the impacts of exposure to various factors known to facilitate the development of pansteatitis, data has been collected from the 1970's to 2018 on dams, water quality, pesticide use, mining operations near the Olifants and Letaba rivers, and tissue samples from living and dead animals. My findings indicate that the development of pansteatitis is primarily linked to water pollution. As top predators, biomagnification of these pollutants would take some time to noticeably impact crocodiles; lower trophic levels have likely been experiencing adverse impacts for a significant amount of time, largely from anthropogenic sources. Crocodile deaths indicate declining ecosystem health and warn of possible danger to other animals.

KIRKHOF CENTER 1142

Mindfulness as a Therapeutic Recreation Intervention for Trauma

Presenters: Leiu Blais, Madison Idoni

Mentor: Dawn De Vries

This presentation will explore mindfulness as a therapeutic intervention for adults who have experienced trauma. Professionals in the Therapeutic Recreation field and other related professions can use mindfulness to assist those who have experienced trauma in the development of acceptance and healthy coping skills to live a quality life.

KIRKHOF CENTER 2266

The Use of Emotion in Activism: An Examination of the Lesbian Avengers

Presenter: Ruth Ott

Mentor: Jae Basiliere

During the 1990s, the Lesbian Avengers was born out of a desire to conduct direct action with the intent of improving the lives of lesbians. This research will examine the ways in which the Lesbian Avengers utilized joy and excitement in their activism and how it coincided with their aims to improve lesbian lives. The research focuses on a content analysis of materials collected during direct actions conducted by the Avengers, such as photographs and signs used during demonstrations, as well as recruitment materials, such as flyers. This project is conducted through an intersectional framework that allows for analysis of how the Avengers countered mainstream perceptions of lesbians and created space for emotion in activism.

KIRKHOF CENTER 2270

Saturated Fatty Acids Impair Organellar Trafficking in Dorsal Root Ganglion Sensory (DRG) Neuron

Presenter: Erin Reasoner

Mentor: Sok Kean Khoo

Diabetic peripheral neuropathy (DPN) is a common complication of diabetes characterized by distal to proximal loss

of sensation in the limbs. In type 2 diabetics, DPN is associated with elevated levels of triglycerides. Fatty acid (FA) precursors of triglycerides impair axonal transport of mitochondria in primary sensory DRG neurons; however, the molecular source of this impairment is unknown. This study compared mitochondrial and synaptic vesicle trafficking in DRG neurons in order to determine whether FAs specifically impair mitochondrial transport or alter trafficking of all organelles. We treated primary cultures of DRG neurons from adult mice with physiological concentrations of saturated and unsaturated FAs. Both organelles showed a significant, dose-dependent decrease in percent motility, and a trending decrease in retrograde and anterograde velocities. Our data indicate that diabetic concentrations of saturated FAs may cause universal trafficking dysfunction in DRG neurons.

Beginning at 11:30 AM

KIRKHOF CENTER 1104

The Effects of Bat Population Decline on Agriculture in the United States

Presenter: Emily Kucharski

Mentor: Carol Griffin

Bats play a significant role in the environment all around the world. They are responsible for pollination, seed dispersal, and insect pest management. Today, there are many threats impacting bat populations, such as wind turbines and white-nose syndrome. Decline in population numbers can lead to serious consequences in many areas of the environment. The Mexican Free-Tailed bat resides in the southern United States and northern Mexico and provides pest control services for agricultural areas. Bats save the U.S. upwards of \$12.2 billion annually. The purpose of this research is to look at bat populations and their decline, and to identify the costs to agriculture. Bat populations are expected to decline and take decades to recover.

KIRKHOF CENTER 1142

Therapeutic Recreation and Community Reintegration for People in the Prison System

Presenters: Brittany Mathis, Morgan Snoke, Josalyn Spear, Victoria Thrun

Mentor: Dawn De Vries

This presentation will explore the use of community reintegration as an intervention for people leaving the prison system. It will focus on ways to reduce reincarceration and increase community reintegration through therapeutic recreation.

KIRKHOF CENTER 2259

Taking Bernard's Next Steps: How Chloroform Affects the Physiological Nature of Single *Chara* Cells

Presenter: Stefanos Apostle

Mentor: Mark Staves

Perturbations in the surrounding environment of an organism, whether they be chemical, electrical, or mechanical, trigger a cascade of chemical reactions that elicit a response by the organism. Anesthetics decrease sensitivity, or the ability of a cell to sense these external stimuli. Claude Bernard pioneered the study of anesthetics in the 19th century, concluding that the effects on the somatosensory systems of plants and animals are similar. Using the giant single internodal cells of *Chara*, and chloroform as an anesthetic, I am testing for the optimal treatment that allows our cells to lose all sensitivity to electrical stimulation and still recover over time. These experiments allow

me to gain insight to the effects and mode of action of anesthetics on the cell. This research will open the door for in-depth experiments, focusing on the complex chemical processes that take place in a stimulus-response signal transduction cascade in both plants and animals.

KIRKHOF CENTER 2266

The Collaborative Creative Writing Process

Presenter: Kathryn Davis

Mentor: Christopher Haven

This presentation will critically evaluate the collaborative writing process and examine how multiple creative genres interact within a singular piece of writing through a creative reading and craft talk. The project consists of a two-part process. The first will be a collaborative composition shifting between prose fiction and lineated poetry. The goal of this collaboration is to allow the authors, a fiction writer and a poet, to determine how the use of vastly different genres within the same piece writing inform the elements of craft between them. Following this collaboration, the writers will evaluate the collaborative writing process with a craft essay analyzing which aspects worked and didn't work in brainstorming, drafting, and revising the piece.

KIRKHOF CENTER 2270

The Impact of Cultural Fluency on Sino-US Relations

Presenter: Ariel Beyer

Mentor: Meghan Cai

In less than 50 years, China has skyrocketed to the status of a global superpower. Today, the Chinese GDP is second only to that of the United States and is expected to obtain the number one spot in the near future. Political and economic dependency between the two nations is higher than ever, and yet news headlines between both countries hint at tensions and cultural misunderstandings. Cultural fluency continues to be a relevant issue, leaving dramatic room for improvement within Sino-US relations. This research examines the evolution and future of relations between the United States and China post Richard Nixon's 1972 diplomatic visit to China, and explores the concept of cultural fluency, as measured by lack of barriers to trade, diplomatic ties, and mutual published opinions, as a determinant for successful relations.

Beginning at 12:00 PM

KIRKHOF CENTER 1142

Animal Assisted Therapy Used in Corrections as a Therapeutic Recreation Intervention

Presenters: Elizabeth Butkis, Ashley Glidden

Mentor: Dawn De Vries

This presentation will explore animal assisted therapy and its use in prison based settings with individuals who are incarcerated and their effects on mental well-being and psychosocial skills.

KIRKHOF CENTER 2259

Modification of the Traditional TREN Scaffolding in Molecular Ligands for Use in Lanthanide and Actinide Metal Remediation

Presenter: Michael Hudson

Mentor: Shannon Biros

The use of nuclear power in industry involves unresolved problems with long term storage and separation of spent nuclear fuel (SNF). The lanthanide and actinide metals in SNF are environmentally hazardous, can be difficult to isolate, and increase the half-life of the nuclear waste. Conventionally, investigation has been focused on synthesizing new CMPO organic ligands for liquid-liquid extraction of lanthanide and actinide metals out of nuclear waste. Prior studies have tested the TREN molecular CAP as a framework for connecting the CMPO groups, but little research has examined exchanging the primary nitrogen in the molecular CAP for other elements. By varying the TREN scaffold molecular CAP we can modify selectivity and percent extraction values for different lanthanide and actinide metals. The synthetic, NMR spectroscopy, and extraction experimental results of these metal-ligand complexes will be presented.

KIRKHOF CENTER 2266

Developing Visual Literacy Skills in Classics

Presenter: Justine Cucchi

Mentor: Melissa Morison

Visual literacy is the ability to critically evaluate images and other visual media. In an increasingly visual culture, students need the skills necessary to critically evaluate images. Some of these skills (defined by the Association of College and Research Libraries) include observing images, finding meaning, and evaluating for effectiveness and accuracy. Focusing on these specific skills, I have created a pool of visual resources for the GVSU Classics Department that show receptions of classical myths, each related to a myth taught in Classics courses. The pool includes images, background information, and tools that demonstrate how the images could be used to teach these specific visual literacy skills. Additionally, I have made a directory of publicly available images that students will be able to use for projects and other research. In my presentation I demonstrate how images of Greek mythology are especially useful tools for promoting visual literacy skills.

KIRKHOF CENTER 2270

Bury Your Gays: History, Usage, and Context

Presenter: Haley Hulan

Mentor: Danielle DeMuth

Bury Your Gays is a literary trope which has been in use in various forms of narrative since its origins in the late 19th century. Most of the previous scholarship on *Bury Your Gays* has focused mainly on certain genres or time periods. This paper will be tracking the trope's usage in several texts in various genres published between 1891 and 2016, all of which feature *Bury Your Gays* as part of the main plotline. These texts, as well as the contexts in which they were written, will be examined using the critical lens New Historicism.

Beginning at 12:30 PM

KIRKHOF CENTER 1142

Bibliotherapy as an Intervention in Pediatric Oncology

Presenters: Brenna Gallagher, Kaitlin Harbin, Claire Schafer, Jenny Schout, Victoria TerAvest

Mentor: Dawn De Vries

This presentation will explore the Therapeutic Recreation intervention of bibliotherapy as a modality to promote positive coping mechanisms and reduced anxiety in children and adolescents with cancer.

KIRKHOF CENTER 2259

An Altar of One's Own: Reimagining Queer and Trans Spirituality

Presenter: Jarred Daniels

Mentors: Julia Mason, Leifa Mayers

For many people of color, churches, temples, and mosques have been places to build community, gather information, and form political strategies against their oppressors. This research is a qualitative data analysis of narratives from people who identify as of color, Queer/Transgender, and as holding some kind of spiritual identity. The narratives include social media content, podcasts, blogposts and interviews. An intersectional frame of analysis allows for the elevating of voices that are often left out of research and will address how these identity categories interact to affect a person's overall experience within various religious/ spiritual communities.

KIRKHOF CENTER 2266

Computational Biology Bootcamp

Presenter: Morgan Oneka

Mentor: Gregory Wolffe

Biology is a subject area with many complex problems that generate enormous amounts of data to be analyzed. Computational biology, a new and growing field attracting both biologists and computer scientists, uses advanced methods from computer science, mathematics, and statistics to solve these complex problems. With the rise of popular DNA sequencing services such as 23andMe and AncestryDNA, most people are familiar with the concept of genomics, and this is indeed an important advancement enabled by the application of computational methods to biology. However, this new approach has also fostered breakthroughs in nearly every other sub-field of biology: systems modeling, phenotypic classification, structural genomics, pharmacodynamics, and more. This presentation provides an introduction to the use of advanced computational methods as used in modern biological research.

Beginning at 1:00 PM

KIRKHOF CENTER 1142

Wilderness Therapy Outcomes for Youth at Risk

Presenters: Kyle Avery, Aikelah Booker, Samantha Dowling, Aileen Feist, Grant Taylor

Mentor: Dawn De Vries

This presentation explores the outcomes of wilderness therapy as it relates to youth at risk.

KIRKHOF CENTER 2259

Histo-geographic Analysis of Voting Patterns and Factors in Wisconsin and Minnesota for the 2004 to 2016 Presidential Elections

Presenter: Michael Miller

Mentor: Elena Lioubimtseva

The purpose of this project was to explore what factors have had the largest effect on voting patterns. The data examined includes, but is not limited to: voting results, demographics, and urbanization on a county level. Geographic analysis of the data was performed and the data was input into Geographic Information System by Esri

co. to develop meaningful representations of the information. Material from the campaigns was critically analyzed to ascertain what was popular with the states in question to establish what made them vote how they did. Current results indicate the counties which lost the most economically and demographically are the ones which have trended most towards disestablishment candidates. Possible applications of the results include utilization for future political campaigns, as well as economic planning and strategy for future elections.

KIRKHOF CENTER 2270

Questions of Loyalty: Middling Carolinian Elites and the Construction of Sovereignty in the Atlantic World, 1772-1776

Presenter: Cole Robinson

Mentor: Michael Huner

This paper examines middling elites of the Carolinas on the eve of the American Revolution. It asks: How did conceptions of sovereignty among this group inform their decisions whether to leave Empire? Recent studies on Atlantic World independence struggles focus on the marginal peoples of colonial empires to offset decades of scholarship focused on leading liberators. Lost often in the discussion are middling elites. My research recovers the story of middling elites of the Carolinas at the start of this Age of Revolutions. Their correspondence reveals a transactional approach to imperial sovereignty. Their loyalty to the British Crown hung on the promise of material benefits acquired while being a subject-citizen within empire, a pattern that persisted throughout the Atlantic World during this period. In the case of the Carolinas, we see that the intensity of economic ties to the metropole dictated inclinations to leave empire or renegotiate its terms.

Beginning at 1:30 PM

KIRKHOF CENTER 1142

Therapeutic Recreation and Interprofessional Education

Presenter: Jenna Watson

Mentor: Dawn De Vries

The focus of this presentation will be analyzing and reviewing if Therapeutic Recreation majors perceive interprofessional education (IPE) as a way to increase other allied health students' familiarity with the therapeutic recreation profession.

KIRKHOF CENTER 2259

3D Animation and New Media

Presenter: Noah Campbell

Mentor: Julie Goldstein

This presentation will talk about my experience over the past two semesters as I have become more exposed to 3D animation and New Media. Technology like Virtual Reality, 3D printing, and CGI are all new media for creating art and telling stories. Grand Valley is now starting to work in these media to train students how to make VR games, videos, and model 3D animations. In this presentation, I will talk about my experience learning how to make content with these new technologies, as well as how Grand Valley is teaching students to adapt to the constantly evolving world of New Media.

KIRKHOF CENTER 2266

Qualitative Needs Assessment of Health Care in Ghana, Africa

Presenter: Paige Baustert

Mentor: Claudia Leiras

A qualitative needs assessment was conducted to determine the accessibility and quality of health care in Winneba, Ghana. Winneba is a coastal village located in central Ghana with a population of about 82,000. It has 14 health care facilities, with only 18 physicians and 354 nurses to provide care.

Participants included a convenience sample of 16 native Ghanaians – 8 females and 8 males between the ages of 18 and 52 years. Ten participants stated that they did not have adequate care and of those ten, 8 also stated that their family did not have adequate health care. When asked if everyone in their community had adequate access to health care, 12 participants stated no that “there is a large gap in our community between resources, finances, and knowledge” and “not everyone has health insurance, therefore they can’t afford care.” Seventy-five percent of males have never visited a health care facility.

KIRKHOF CENTER 2270

Comrade King

Presenter: Courtney Hartline

Mentor: Jeffrey Kelly Lowenstein

Comrade King is the story of Khulu Radebe’s crusade for freedom during the anti-apartheid movement in South Africa. As a teenager, Radebe was imprisoned for fighting for his rights on Robben Island alongside the legendary ANC leader President Nelson Mandela. Upon his release, Radebe journeyed across the globe to continue advocating for South Africans’ freedoms, and to this day, continues lobbying for a united African continent, as King of the Embo Nation. This presentation, and subsequent short group discussion, will center on Radebe’s unbelievable life journey, encompassing his time as a comrade in the African National Congress, to his coronation as king, and beyond. Through examining Radebe’s struggle and major successes, we can learn how to approach and advocate for lasting change in the contentious political climate we, as Americans, face every day.

Beginning at 2:00 PM

KIRKHOF CENTER 1104

Changes in Michigan’s Lower Peninsula’s Fire Regimes

Presenter: Jacob Boogaart

Mentor: Carol Griffin

Fire is a natural disturbance that has played a role in shaping the ecosystems in Michigan. The physical characteristics of the landscape and the identification of different forest communities can be used to determine how fire is going to interact in Michigan’s ecosystems. Fire regimes can be classified into five distinct groups, which depend on severity of the fire and frequency of wildfire events. Using land cover data of Michigan’s Lower Peninsula at different time periods (1800, 1978, and 2011), maps can be used to compare how Michigan’s fire regimes have changed over time. I expect to find that Michigan’s Lower Peninsula’s fire regimes have shifted from frequently occurring fires with mixed severity (category one) around the 1800’s to low frequency fire events with high severity (category five) of the present.

KIRKHOF CENTER 2259

Youth and Struggle: A Chronicle of Young Political Prisoners on Robben Island

Presenter: Nick Moran

Mentor: Jeffrey Kelly Lowenstein

Figureheads like Nelson Mandela often are used as tools to paint what life was like for political prisoners on Robben Island, the prison used to house those who lashed out against racial segregation and discrimination. By using fighters like Mandela as our main tool to decipher what life was like on Robben Island, we ignore those who were in cell blocks known for being more active and vocal in protest, as well as younger ex-inmates. By also noting the perspectives of the youth, we see another side to systems of education on the island, hierarchy, and different forms of protest. "Youth and Struggle: A Chronicle of Young Political Prisoners on Robben Island" consists of research gathered through interviewing actual young ex-prisoners. By learning their stories, their experiences can be juxtaposed with more popular accounts of life on Robben Island to highlight the discrepancies in how we tell this important piece of history.

KIRKHOF CENTER 2266

What Will Become of the Southeastern Bat? A Population Genetic Assessment of *Myotis austroriparius*

Presenter: Faith Ureel

Mentor: Amy Russell

White-nose syndrome (WNS) in North America has variable infection and mortality rates among host species. This project was undertaken to determine the population genetic differences among species of bats that have experienced outbreaks of WNS and those that have not. Little is known about the population dynamics of *Myotis austroriparius*, a species that has recently been documented as a host to *Pseudogymnoascus destructans*, the fungus that causes WNS. In order to forecast the impact of WNS on *M. austroriparius*, we are reconstructing the genetic structure and historical demography of a sample of 43 bats from across the species' range. Bats were genotyped at 10 microsatellite loci. Here we present population structure analyses and Bayesian skyline reconstructions of changes in effective population size through the species' recent history. This study will allow bat conservation strategies to be better informed about the ways in which *M. austroriparius* may be affected by the WNS epizootic.

KIRKHOF CENTER 2270

Value of Integrated and Intersectional Healthcare in the Context of the Opioid Crisis

Presenter: Tanner Derror

Mentor: Karen Zivi

Many proposed solutions for the opioid crisis presented in medical journals and discussions have been largely superficial and focused on the role of primary care providers and prescribers while failing to evaluate underlying structural problems in the traditional medical model. Integrated healthcare and intersectional social justice approaches are useful tools that allow for critical evaluation of these proposed solutions and identification of underlying structural problems. Integrated healthcare models incorporate the services of mental healthcare professionals with the services of traditional primary care physicians to provide a more holistic healthcare approach for patients. The integration of physical and mental healthcare addresses many of the underlying structural problems implicit in a traditional medical model and relieves primary care physicians from over-extending

themselves.

Beginning at 2:30 PM

KIRKHOF CENTER 1104

Effects of Runoff on Stream Health by Using Macroinvertebrates as Indicators

Presenter: Samantha Cooper

Mentor: Carol Griffin

Surface runoff threatens the health of streams that many species depend on. Runoff from rain and snowmelt washes away sediments and inorganic salts from roadways, and pesticides and nutrients from agricultural fields. To determine overall stream health macroinvertebrates can be used as indicators because they are relatively inactive. In this study, I will examine the water quality of Bellamy Creek in Ionia County, Michigan by collecting and identifying macroinvertebrates using the Rapid Bioassessment Protocol (RBP). I will collect from 5 reaches of the stream: upstream and downstream from a road bridge, upstream from an agricultural field, and 100 feet downstream and one mile downstream from the agricultural field. I expect to find higher concentrations of macroinvertebrate species, indicating poor water quality, downstream from the road bridge and agricultural fields compared to the reaches upstream.

KIRKHOF CENTER 2259

Solid Phase Peptide Synthesis of Potential Focal Adhesion Kinase Inhibitors

Presenter: Michael Maleszyk

Mentor: Laurie Witucki

Focal adhesion kinase (FAK) is an enzyme involved in human growth and cell proliferation. Its mechanism involves putting a phosphate group on the end of a tyrosine side chain. Mutations of this enzyme have been found in cases of breast cancer and several other forms of cancer such as pancreatic and colon cancer. Previous work in this research lab has produced a peptide called LS-1 which acts as an excellent substrate for FAK. The purpose of this research was to design and synthesize potential inhibitors of FAK based on the structure of LS-1, but containing a non-phosphorylatable tyrosine sidechain. A modified tyrosine derivative which contains an alkyl ether rather than an alcohol was incorporated into several peptides via solid phase peptide synthesis.

KIRKHOF CENTER 2270

From Historical Figures to Legendary Symbols: The Influence of Santiago and El Cid on the Spanish “*Reconquista*”

Presenter: Kira Rosol

Mentor: Alice Chapman

From 711 to 720, an army of North African Berbers defeated the weakened Visigothic kingdom, and the Umayyad caliphate established its authority throughout a majority of the Iberian Peninsula which was called the al-Andalus. Determined to combat Muslim sovereignty and claim their ancestral land, the Spanish began a struggle to achieve the “*Reconquista*,” which lasted for seven hundred years and sought to establish Catholic jurisdiction throughout the Iberian Peninsula. In order to invigorate and galvanize Spanish Christians, the “*Reconquista*” looked to Saint James the Greater, an apostle of Jesus Christ, and Rodrigo Díaz de Vivar, a mercenary, transforming them into legendary symbols: Santiago and El Cid. This study will analyze how these historical figures assumed new and antithetical

identities that significantly influenced the success of the Spanish “*Reconquista*.”

Beginning at 3:00 PM

KIRKHOF CENTER 1104

Changes in Elk Habitat in the Pigeon River County State Forest Due To Climatic Changes

Presenter: Sierra Kolatski

Mentor: Carol Griffin

Climate change is being influenced by the greenhouse gas CO₂. With the change in climate, there has been a rise in temperatures and changes in precipitation. This is predicted to cause a shift in many different parts of ecosystems, specifically forests. It is predicted that the forests will mostly shift to the north due to the climatic changes. Using geographic information systems (GIS) it is possible to predict the future ranges of specific habitats. GIS also makes it possible to determine the specific habitat of elk in the Pigeon River County State Forest. When forests shift northward, I expect that the animals will also shift northward with the trees. The elk were reintroduced to Michigan in the 20th century in the Pigeon River area and they have successfully sustained a healthy population in this area. The elk population in the Pigeon River is the main focus of this study; I expect that with the elk will shift in tandem with the trees.

Beginning at 3:30 PM

KIRKHOF CENTER 1104

Comparing Runoff Reduction of Potential Green Infrastructure at East Kentwood High School

Presenter: Tony Duong

Mentor: Carol Griffin

Green infrastructure (GI) is an approach to development, and especially water management, that focuses on minimizing impacts on natural ecosystems. Most GI is designed to reduce surface runoff increased by impervious surfaces, which is inherent in urban development. An excess of surface runoff creates ecological problems, including accelerated erosion and increased risk of flooding. Implementation of GI can mitigate these problems.

The 16 acre study area is the campus of East Kentwood High School (EKHS), Kentwood, Michigan. Two stormwater models were used to estimate installation costs of GI and to estimate current levels of runoff volume from potential GI installations, which are compared to levels from existing infrastructure. Potential GI examined are retention basins, green roofs, porous pavements, rain gardens, and rain barrels. I expect to find significant reduction in surface runoff from all potential GI installations.

KIRKHOF CENTER 2259

Understanding Late Antique and Early Islamic Spain: Roman, Visigothic, and Moorish Influences on the Iberian Peninsula

Presenter: Megan Kruskie

Mentor: Charles Pazdernik

The integration of the Iberian Peninsula within the Roman empire made a lasting impact upon the subsequent development of Spain under the Visigoths and the Moors. Combining ongoing investigation of the literary sources for the late antique and early Islamic periods (fifth-eighth centuries CE) with careful and thorough site visits during a study abroad experience in the Fall 2017 semester, I focused on the former Roman provincial capitals at Cordoba, Tarragona, and Merida and, within these respective cities, the redevelopment of the Great Mosque, the Cathedral of Santa María, and the Moorish Citadel. My project examines how the Visigoths and the Moors successively exploited Roman infrastructure and imperial ideologies in order to secure their positions of authority. The continuous occupation and elaboration of these places challenge traditional historical narratives of decline and fall and illustrate processes of cultural transformation and adaptation.

KIRKHOF CENTER 2270

National Student Advertising Competition (NSAC) Team

Presenters: Olivia Chriss, Kyra Lansky, Tara O'Connor, Gonzalo Rodriguez-Villasante Fernandez, Brooke Rosier
Mentor: Robin Spring

Ocean Spray has a problem. The household name, with the easily identifiable “men in the bog” commercials, has a loyal customer base of individuals 45 and older, but has struggled to tap into younger markets. While overall juice sales continue to decline nationally, Ocean Spray needs a way to resonate with millennial consumers in order to ensure long-term growth. To solve this, the Grand Valley State University National Student Advertising Competition Team has spent the past seven months developing a comprehensive advertising campaign for Ocean Spray. This plan will develop a relevant brand identity for Ocean Spray based on salience, differentiation, and meaningfulness to resonate with Millennials ages 24-35. This will in turn, increase brand awareness by 7%+ and grow household penetration by 0.5% over the next two years, ensuring that Ocean Spray will have loyal customers for years to come.

Beginning at 4:00 PM

KIRKHOF CENTER 1104

Analyzing Green Areas in Grand Rapids to Expand Their Urban Tree Canopy in Minority Neighborhoods

Presenter: Robert Cloy
Mentor: Carol Griffin

Parks, green spaces and urban gardens provide many valuable services to society and the communities they reside in. The urban forest in Grand Rapids returns \$3.60 for every dollar the city spends and saves the city \$2.64 million by providing annual ecosystem services such as intercepting storm water, conserving energy, removing air pollutants, and reducing the amount of CO₂ and N₂O. Grand Rapids has a current urban canopy tree cover of 34% and their goal is to obtain an UCC of 40%. Grand Rapids needs 1,640 acres of trees to be planted to reach their 40% canopy goal 75% of trees can be planted in parks, while 25% can be planted in neighborhoods around the city. I believe neighborhoods around South Grand Rapids and all of the city-owned parks will have sufficient space to plant trees.

KIRKHOF CENTER 2259

Trans, Gender Non-Conforming, and Non-Binary Experiences with the US Health Care System

Presenter: Brenna Wyffels

Mentor: Leifa Mayers

This presentation identifies health care obstacles faced by members of the trans, gender non-conforming, and non-binary community. Obstacles include fear of discrimination, lack of insurance, and a lack of competent and willing providers. Through a Qualtrics survey distributed to university students in the target community and a literature review, solutions to specific health care obstacles were identified. Solutions to the mentioned obstacles to specific health care obstacles were identified. Solutions to the mentioned obstacles include the alteration of intake forms, better sensitivity and medical training for health professionals, and the demedicalization of gender identity disorder. Finding solutions to eliminate health care obstacles for the mentioned community is important because when they are able to access the care they need, negative health outcomes like substance abuse, suicidality, and comorbid mental health conditions decrease.

Beginning at 4:30 PM

KIRKHOF CENTER 1104

Predicting Hemlock Occurrence Using Reflectance Values with ArcGIS

Presenter: Kari Lewis

Mentor: Carol Griffin

Invasion of wooly adelgid (*Adelges tsugae*) insects is threatening eastern hemlock (*Tsuga canadensis*) trees all across the eastern United States. Loss of hemlock trees is detrimental to forests because they provide structure, biodiversity, habitat, and regulation of the hydrologic cycle. For these reasons, forest managers strive to eliminate wooly adelgid infestations but struggle due to the large area at risk. Geographic information systems (GIS) may help in pinpointing locations of hemlock trees. Using known hemlock locations at Pigeon Creek Park, aerial imagery will be used to assess light reflectance wavelengths with ArcGIS. If hemlocks are found to reflect a unique reflectance value, then hemlock locations will be predicted in Duncan Woods and Mulligan's Hollow in Grand Haven, Michigan. I expect to find that hemlock occurrence can be predicted using reflective values of aerial imagery using ArcGIS.

KIRKHOF CENTER 2266

Analysis of CLRG World Irish Dancing Championships Results and Study of Traditional Set Dances

Presenters: Victoria Force, Alena Woellecke

Mentor: John Gabrosek

With the introduction of the 1995 phenomenon *Riverdance*, Irish dancing began to shift from an artistic expression of Irish culture to a highly competitive global sport. Because of the relatively quick increase in interest and intensity, Irish dancing has become a sport that requires Olympic-level dedication without access to research and resources that sports of a similar caliber enjoy. To contribute to the modernization of Irish dancing, we have completed the first statistical analysis of the results from the CLRG World Irish Dancing Championships between 2011 and 2018. We examined a variety of trends in placements, focusing on the dancer's consistency, region, and country of origin. There will also be a demonstration of traditional set dances that we have learned as part of our research.

KIRKHOF CENTER 2270

Immigration

Presenter: Skyler Stoll
Mentor: Rachel Peterson

The intent of this report is to come to a better understanding of how our country as whole views the role of Immigration. Within our current political climate, there has been a strong desire to redefine our social conventions of what is American, and this places minorities, people of color, and immigrants at a disadvantage. With these main demographics coming under fire, and being actively targeted due to their race, culture, and citizenship status, this report discusses why these groups are being mistreated. This report will look at how the historical importance and patterns of immigration have drastically impacted how citizens and lawmakers view this topic of legal immigration. This report will use the historical research method and the narrative inquiry research method to help bolster awareness of these nativist sentiments and to display how historical tradition of these sentiments has created fear and misunderstanding in the modern world.

Panel Presentations, Abstracts & Schedule

Beginning at 9:00 AM

KIRKHOF CENTER 2263

Dirty Wars in Latin America

Presenters: John Beery, Kayla Hey, Carla Villasana-Acosta

Mentor: David Stark

John Beery

This presentation will review and examine the rise of the Bordaberry dictatorship in Uruguay within the context of the rise of the paramilitary organization, the Tupamaros. The Tupamaros rose to prominence in the country for their extreme and hostile actions against the Uruguayan government. In response to the success of the organization the Uruguayan government began using torture, brutality, and oppression to suppress the movement. The two groups would battle back and forth, each escalating the conflict until the Uruguayan military decided to assume power and make a deal with then President Bordaberry to dissolve the Parliament and take total control. This discussion will address the political and economical context that allowed the Tupamaros to rise to prominence in Uruguay, how the public slowly turned on the group, and how the war between the Tupamaros and the government led to the torture, extradition, and extrajudicial killings of at least 60,000 citizens.

Kayla Hey

This presentation will review the military dictatorship of General Hugo Banzer in Bolivia, and how his tactics of oppression continued to influence Bolivian politics through the 1980s and beyond. During his seven year dictatorship, Banzer tried to obtain stability in one of the most unstable countries in the world. He would attempt to do so through torture, disappearances, and brutal oppression. He would also accomplish his crimes with the help of Operation Condor and monetary assistance from the United States. This discussion will address how Banzer momentarily achieved stability in Bolivia, how he influenced future politics, how the U.S. was involved, and how the Bolivian dirty war is connected to the other dirty wars that were occurring in Latin America during this time frame.

Carla Villasana-Acosta

Between the 1970s and 1980s, Chile and Argentina were ruled by military dictatorships. These military regimes systematically persecuted thousands of citizens accused of subversion against the state. During this time period, the Catholic Church was one of the strongest and most influential institutions in both Chile and Argentina. The nature of its influence, however, was significantly different in each country. This presentation will thus examine the contrasting roles played by the Chilean and Argentine Catholic Churches within the context of the Dirty War dictatorships, determining the ideological and historical factors that led to these differences. As a result, the presentation will explain how the Catholic Church in Chile became the strongest voice of opposition and a major source of social and legal support for the victims while the Argentine Catholic Church legitimized and supported the military regime.

Beginning at 10:00 AM

KIRKHOF CENTER 2263

Learn The Terms Branding Panel

Presenters: Kaitlyn Allison, Olivia Nelson, Kendra Smith, Courtney Wagasky
Mentors: Vinicius Rebello Lima, Gayle Schaub

Our graphic design class addressed the problem of students' lack of understanding of frequently used library terms. This project was based on a study done by GVSU librarians that revealed that many students did not know common terminology used by librarians and professors. The class was tasked with creating a visual glossary to help make the terms more accessible and comprehensible. The class split up into four groups, with each group conducting their own surveys of students and developing a problem statement. From there, the groups used the data they collected to brainstorm touch points that students would be able to interact with and learn from. Designs for the various elements were created by each group and in the end, the design that was deemed most successful by the library staff was to be displayed throughout the library. The project required us to consider the way information is shared and how design can increase information literacy.

Beginning at 11:00 AM

KIRKHOF CENTER 2263

Perspectivas literarias 1

Presenters: Melina Brown, Alicia Harley, Kira Rosol, Mallory Wright
Mentors: Mayra Fortes Gonzalez, Gabriela Pozzi

Melina Brown

Niebla y La vida es sueño: Rompiendo las barreras

La idea de la mortalidad asusta a muchas personas. Otras sienten lo opuesto. A pesar de haberse escrito con unos 300 años de diferencia, tanto *La vida es sueño* de Pedro Calderón de la Barca como *Niebla* de Miguel de Unamuno aluden a muchos aspectos similares de la mortalidad, mientras juegan con las barreras entre la realidad y la ficción. Los dos textos rompen las murallas entre el lector, los personajes y el autor. Este estudio enfoca en estas similitudes para analizar el cambio y el efecto de las rupturas de límites en estos dos textos literarios. Esta técnica cambia la idea tradicional de la realidad, creando un ambiente en el cual el lector tiene que cuestionar lo que es real y lo que es un sueño en su propio mundo.

Alicia Harley

El Evangelio de Ángela

San Manuel Bueno, mártir se presenta como el testimonio de Ángela Carballino sobre la vida de su mentor don Manuel. Algunos críticos psicoanalíticos especulan que la narradora sufre de problemas sexuales y emocionales debido a una atracción a don Manuel. Aunque los propósitos del autor real no se pueden elucidar, algunas de estas reclamaciones en los estudios previos se basan en inferencias extratextuales. Este estudio concuerda que, efectivamente, el testimonio de la narradora es subjetivo y poco fiable, pero esto se debe, más bien a su devoción religiosa. De hecho, tomando en consideración los comentarios del "autor" mismo en el epílogo, hay conexiones específicas entre la narradora y los escritores de los evangelios de la Biblia. El autor expresamente crea una narradora poco confiable para demostrar sus propias confesiones religiosas poco convencionales.

Kira Rosol

Navegar culturas dispares: La identidad híbrida en *Pocho* y "I am Joaquín"

Más que una ojeada en el espejo, la identidad es una compleja construcción social que está formada por las tradiciones, los valores y las creencias de una cultura. Debido a la asimilación inevitable que sucede en un país extranjero, los inmigrantes y sus descendientes desarrollan un concepto paradójico conocido como la identidad híbrida, una identidad conjuntada de varias culturas. En 1959, el escritor mexicano-americano, José Antonio Villarreal, publicó su novela, *Pocho*, que expone la experiencia de la identidad híbrida como una fuerza de destrucción. Casi una década después, en 1967, durante el Movimiento Chicano, Rodolfo Gonzales escribió el poema, "I am Joaquín", que presenta el tema de la identidad híbrida como una fuente de afirmación cultural. A través de una comparación de estas dos obras, este ensayo analiza cómo la política de momentos históricos transforma la percepción de la identidad híbrida.

Mallory Wright

La corrupción de la pureza en Sonata de otoño

Desde una perspectiva de hoy en día, es difícil comprender que existió un momento, la modernidad, o principios del siglo XX, en el que la mujer se consideraba más bella cuánto más enferma estuviera, o sea, lo menos amenazadora que fuera. Este tema está presente en la novela *Sonata de otoño* del escritor Ramón del Valle-Inclán. Su libro publicado en 1902, introduce al Marqués de Bradomín y su amante Concha, que encarnan dos lados de una relación sacrílega. La novela presenta los temas intercalados de la religión y la sensualidad, y además las consecuencias de unir los dos. El Marqués de Bradomín manipula a Concha cuando está más vulnerable, en su lecho de muerte, para satisfacer sus deseos sexuales y corromperla. Valle-Inclán usa un lenguaje simbólico basado en metáforas religiosas para apoyar la posición de Concha como la mujer modernista piadosa, y el Marqués de Bradomín como el cruel corruptor de una santa y el rival de Dios.

Beginning at 1:00 PM

KIRKHOF CENTER 2263

Neurological Disorders Research Panel: Molecular Diagnostics and Etiology

Presenters: Katelyn Anthony, Brooke Armistead, Ashleigh Harrah, Erin Reasoner

Mentor: Sok Kean Khoo

Katelyn Anthony

MicroRNAs in urine as detection biomarkers for Parkinson's disease

Parkinson's Disease (PD) is the second most common neurodegenerative disorder, affecting 1 million Americans and 10 million people globally. PD is characterized by alpha synuclein protein accumulation in the brain, causing dopaminergic neuron death and subsequent motor and non-motor dysfunctions. Current diagnosis is based on subjective observations of motor symptoms which occur after 50-70% of a patient's dopaminergic neurons are lost; there is no laboratory test to detect PD. MicroRNAs (miRNAs) are small RNAs that regulate gene expression by binding to the 3'-UTR of messenger RNA. Using the Firefly Particle Technology, we will examine the expression of 60 miRNAs in urine of PD patients and compare them with urine of healthy controls. The panel of miRNAs is neurology-related. We aim to identify a set of miRNAs in urine as a quantifiable and non-invasive diagnosis test for PD.

Brooke Armistead

Newborn gene expression provides insight to causal pathways of cerebral palsy

Cerebral palsy (CP) describes a group of neurological disorders that cause motor impairments in young children. CP is generally diagnosed at age 1-3, based on motor skill development analysis. Here, we applied quantitative real-time PCR on archived newborn bloodspots to evaluate expression of three genes: *S100A9*, *ALOX5AP*, and *TNF-alpha*. Each gene was previously shown to distinguish CP children from healthy controls (HC). *S100A9* is significantly up-regulated in CP compared to HC (p-value = 0.000845), and can significantly predict CP outcome at the neonatal stage with 67.57% sensitivity and 51.15% specificity (p-value = 0.0025). There is no significant difference in gene expression of *ALOX5AP* and *TNF-alpha* between CP and HC (p-values = 0.8291 and 0.2292, respectively). A quantitative method to early detect CP allows patients to receive earlier interventions to increase overall quality of life.

Ashleigh Harrah

MicroRNA-34b/c as disease progression biomarkers for Parkinson's disease

Parkinson's Disease (PD) is a neurodegenerative disorder that presents with motor and cognitive impairments. While the cause of PD is unknown, PD patients are known to have decreased dopamine in the brain due to aggregation of alpha-synuclein (a-Syn) protein. MicroRNAs (miRNAs) bind to complementary mRNAs to down-regulate protein expression. Downregulation of miRNA-34b/c has been found to increase a-Syn expression. Here, we used quantitative real-time PCR to evaluate miRNA34b/c expression in sera of fast and slow PD progressors to develop a blood-based progression biomarker for PD. We found that fast PD progressors have significantly higher expression of miRNA-34b (p-value 0.0025) and miRNA-34c (p-value 0.0156), when compared with slow PD progressors. Thus, miRNA-34b/c may be used as potential biomarkers to differentiate fast from slow progressing PD to enable more effective disease management.

Erin Reasoner

Differential effects of saturated and unsaturated fatty acids on mitochondrial trafficking in dorsal root ganglion (DRG) sensory neurons

Diabetic peripheral neuropathy (DPN) is a common complication of diabetes characterized by loss of sensation in the limbs. In type 2 diabetics, DPN is associated with elevated levels of triglycerides. Saturated fatty acid (SFA) precursors are known to impair axonal transport of mitochondria, however, unsaturated fatty acids (USFA), do not share this effect. To evaluate whether this impairment can be reversed or prevented, primary cultures of DRG neurons from adult mice were pre-treated with USFA oleate for 12-hours, preceding a 12-hours exposure to SFA palmitate, or post-treated with oleate following palmitate exposure. Cells treated with oleate before or after palmitate exposure showed significant improvements in both motility and velocity. Our data indicates that USFAs can restore mitochondrial trafficking inhibited by diabetic levels of SFAs.

Beginning at 3:00 PM

KIRKHOF CENTER 2263

Perspectives on Latin American Literature and Culture

Presenters: Hannah Noel, Brittany Sincox, Holly Wright

Mentor: Medar Serrata

Hannah Noel

Poems by three different Latin American poets are examined through the scope of identity. Guillén uses his identity

as a mulatto, someone with European and Indigenous heritage, to bring together the black and white identities he sees through his grandfathers in his poem “Ballad of Two Grandfathers.” Neruda, in his poem “The Heights of Macchu Picchu,” juxtaposes the identity in modern times to that in ancient civilizations in order to criticize the lack of identity in modern civilizations. Belli uses identity to connect herself to the ancient indigenous civilizations, although she is of Italian descent, in her poem “In the Language of Memory,” and to condemn the destruction of the Spanish Conquest. Although each poet concludes with a different purpose, they all explore identity to accomplish it.

Brittany Sincox

The events of the Mexican Revolution starting in 1910 became a source of inspiration and nationalism for many people in Mexico. However, national identity was not as strong during the revolution as it was at the end of the socio-economic reform that followed. *The Underdogs* by Mariano Azuela and *A Sunday Afternoon in Alameda Park* by Diego Rivera are two distinct representations of the different forms of nationalism that existed throughout the combat and socio-economic phases of the Mexican Revolution. The contrasting views of the two works reveal a timeline of the Mexican national identity as it evolved during and after the events of the Mexican revolution from dismantled groups of people to a strong and united nation.

Holly Wright

Slave resistance and assimilation have previously been thought of as exclusive concepts. Recently, historians have suggested that Latin American slaves were able to resist their enslavement through assimilation into the Latin American culture. The life of Juan Francisco Manzano, a Cuban mulatto slave in the mid nineteenth century, demonstrates many of the ways in which slaves reacted to their enslavement. By studying his autobiography, supplemented with secondary sources, I was able to draw the conclusion that Manzano actually resisted his enslavement *in order to* assimilate into the culture. This is seemingly the opposite of previous arguments. This finding sheds new light on Latin American slavery and how the efforts regarding resistance and assimilation were able to intertwine.

Beginning at 4:00 PM

KIRKHOF CENTER 2263

Perspectivas literarias 2

Presenters: Emily Doran, Betsy Lake, Katelyn Wehrle

Mentor: Gabriela Pozzi

Emily Doran

El control masculino del cuerpo femenino en *La melena de la discordia*

En su novela *La melena de la discordia*, la escritora feminista Carmen de Burgos examina y critica las maneras en que los hombres del siglo XX controlaban los cuerpos femeninos y, como resultado, a la mujer entera. A través de la novela, esta dominación se manifiesta de manera sutil en la regulación masculina de la moda y de la apariencia de la mujer, la apropiación del lenguaje que describe la forma femenina, y la intervención física. Lo que resulta es una falta de independencia cotidiana y legal de la mujer, la niñez perpetuada dentro de la relación conyugal y un enfoque desproporcionado en el cuerpo de la mujer como la fuente de su valor. Aunque las consecuencias de la conquista del cuerpo femenino son sutiles y “benignas” en esta novela, todavía tienen implicaciones insidiosas y profundas que pueden funcionar como precursores a lo que ocurre en otra novela más flagrante de Burgos, *El artículo 438*.

Betsy Lake

Emilia Pardo Bazán, *Insolación* y la mujer del siglo XIX

En su novela *Insolación*, Emilia Pardo Bazán, emplea los espacios, la moda y las voces diferentes en el texto para criticar el rol de la mujer española en el siglo XIX y demostrar cómo la sociedad restringe su identidad. Mientras la casa y la iglesia son los lugares de la mujer, las calles y los espacios exteriores les pertenecen a los hombres, es decir que la mujer no tiene la libertad de hacer sus propias decisiones y solo puede quedarse escondida lejos del público. Según Pardo Bazán, la moda proporciona una manera en que la mujer puede expresarse a sí misma, pero, paradójicamente, es también una forma en la que la sociedad restringe a las mujeres y lo que ellas se ponen y, por ende, las ideas que tienen. Por medio de varios narradores que representan perspectivas diferentes sobre el hombre y la mujer, la autora sugiere cómo estas concepciones de género influyen en la identidad de la protagonista, y en la mujer del siglo XIX.

Katelyn Wehrle

Vislumbres de la Guerra Civil Española en *Fiesta al noroeste*

La obra de Ana María Matute, *Fiesta al noroeste*, se puede considerar una representación literaria de la Guerra Civil Española. Matute emplea el conflicto entre dos hermanos, Juan Medinao y Pablo Zácara, como una alegoría de la guerra fratricida. La autora configura a los dos hermanos como opuestos que encarnan los distintos lados de la contienda. Específicamente, Juan representa a los grupos que apoyaron a los fascistas, la clase alta y la Iglesia, mientras Pablo representa a la clase trabajadora y las ideologías de izquierdas que apoyaron a los republicanos. Las configuraciones de los hermanos y la tendencia a la violencia engendrada por Juan, que es prevalente a lo largo de toda la obra, reflejan las experiencias de Matute, quien creció durante la guerra y la postguerra.

Exhibition of Art Abstracts

9:00 AM - 5:00 PM

Artist Reception 4:00 PM

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 01

Dysmorphia

Presenter: Rachel Britton

Mentor: Stafford Smith

Body dysmorphic disorder is the preoccupation with an imagined or slight physical defect of one's body that produces stress or behavior inefficiencies (merriam-webster.com, 2018). When people have body dysmorphia, they obsess over their physical flaws for hours a day, engaging in repetitive behaviors such as skin picking, hair pulling, and changing clothes excessively (adaa.org, 2018). Britton's *Dysmorphia* explores the disorder's constant presence in peoples' lives.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 02

Wedding Invitation: East and West Germany

Presenter: Laura Schippers

Mentor: Vinicius Rebello Lima

In 1990, East and West Germany became one unified nation after more than 40 years of separation. It is a vital moment in Germany's history, and with this project I aimed to capture the spirit of the reunification by creating wedding invitations. A cohesive aesthetic across all components of the invitation and a sensitivity for detail work together to produce a successful final piece.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 03

Contrast and Composition

Presenter: Joshua Houchlei

Mentor: Vinicius Rebello Lima

Contrast and Composition is a Graphic Design 1 project that focuses on the relationships between letterforms of different varieties. An important thought process to maintain when looking at these compositions is to view the letterforms as a shape rather than a letter, since the main focus of this project is to view the individual characteristics of a letterform. A heavy emphasis is placed upon the Gestalt Principles of Grouping as well as effective representation of figure/ground relationships. In particular, these compositions use continuations in abundance, while also including examples of compositions that are heavy on negative space, and light on negative space and, in addition, examples containing highly textured compositions. This variety of composition types helps to emphasize the complex nature of typefaces when compared to one another directly.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 05

You Have Gone But I Still Feel Your Gaze

Presenter: Jane Dandron

Mentor: Dellas Henke

In my work I attempt to explore what my place in the world entails by reflecting on past experiences, emotion, and memory. Through etchings that often take on a life of their own I constantly search for what is a further understanding of the world around me. Domestic spaces are used to replay life moments that are often contradictory as well as grounding, building these spaces for my figures who are also searching for more. Space can be intuitive and emotional, where we experience the world with all of our sense – not just our eyes. A place where it becomes almost like a dream; drifting for something to cement us. The flexible and unpredictable quality of printmaking mimics the stories that emerge, it is not only a physical process but is a mental one as well that is essential to the creation of my work.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 07

Image & Word

Presenter: Karolina Ptak

Mentor: Vinicius Rebello Lima

The premise of this project was to choose an object or category, and combine the word name with images representing it in a 7.5" square composition. I chose to work with the word "summer." In creating the compositions, I really wanted to present the warmth and relaxation of the season, and in order to accomplish this, color was a big factor. I chose to incorporate bright, happy colors and images that were also bright and vivid. In arranging the type and images, I tried to view each letter as a form itself, and create a playful arrangement of the two.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 08

Image, Word & Text

Presenter: Karolina Ptak

Mentor: Vinicius Rebello Lima

This project called for me to choose an object or category. There were four components to the composition: the title, image, subhead, and body of text. The word I chose was "circus." I felt like the word "circus" has a lot of energy to it, and therefore I tried to show that in my compositions by using pops of color and angles to create movement. A circus has a lot of different associations with it. It can be thought of as a fun attraction or scary clowns can come to mind. I wanted to have diversity in my compositions to represent this.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 09

Cherry Hill Brochure

Presenters: Sabrina Antcliff, Katherine Irwin

Mentor: Vinicius Rebello Lima

After weeks of primary and secondary research and photo taking, Katherine and Sabrina created the Cherry Hill Brochure. They drew inspiration from Instagram and Facebook when creating the layout and determining the size of the brochure to try to appeal to their target audience, millennials moving to the area. This brochure needed to represent the neighborhood for what it is, while primarily focusing on feeling welcoming and like the right choice for a millennial to live. In order to further their inspiration, they photographed and curated photos of the district in such a way that the end result would feel light and airy. Their strategic use of color was executed in order to enhance the tones in the photographs, focusing again on trying to convey an airy clean atmosphere throughout the brochure.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 10

***Split* Movie Poster Design**

Presenter: Jessica Allen

Mentor: Vinicius Rebello Lima

The purpose of this project was to view a movie for the first time and create a visually stimulating representation of what impact the movie had on us as viewers and designers. Choosing the M. Night Shyamalan psychological thriller *Split* (2016), the film follows a character expressing evidence of 23 different personalities, both harmful and kind. I chose to integrate the hand-drawn elements of graphite illustrations and technical qualities of graphic design to capture the uneasiness of the film. Through the character's gaze I intended to draw the viewer in with a curious glimpse at an inner battle for power. After multiple versions and variations, I ended with this piece as I found the intimidation of the large figures to accurately expose the inner conflict that the film follows.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 12

Pennello Art Supplies

Presenter: Kendra Smith

Mentor: Vinicius Rebello Lima

Pennello art supplies started as a cylindrical canister series project in a packaging design class and expanded into a brand and line of products for the Honors Senior Project. When walking through the art supplies section at the store, one might leave feeling uninspired by the generic packaging. For the art student audience, the Pennello brand seeks to inspire creativity and expression through its aesthetics. Bold colors, hand drawn typography, and illustrated patterns were implemented in order to make Pennello stand out from the generic art supplies and bring creativity into art student tool kits. Branding was also explored through the shifting color choices and patterns for different products. This project helped question how far a brand identity can be pushed and still remain recognizable, yet innovative for the market in which it exists.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 13

Night Circus Wedding Invitation

Presenter: Ryan Labine

Mentor: Vinicius Rebello Lima

Displayed is a wedding invitation set inspired by the novel *The Night Circus* by Erin Morgenstern. It depicts the proposed marriage of the novel's two main characters, Celia Bowen and Marco Alasdair. The set includes a reception card (with map on reverse), a response card, and two admission tickets to the circus. Opening the wedding invitation itself was designed to be an almost magical and surprising experience. The black and white circus tents pop off the page with dramatic flair while also framing the bride and groom to be. The color palette mimics the black and white aesthetic of the novel, red only used as an accent and golden-yellow to imply a mystical touch. The reception and response cards were designed to mimic the size and feel of a tarot card, while the design on the back of the response card furthers this imagery of a tarot card.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 14

Self Image

Presenter: Benjamin Symons

Mentor: Norwood Viviano

A project created during Art 270, Introduction to Sculpture, Fall 2017

People have a tendency to change their personality to fit the situation. Rather than having the surroundings change the personality of this piece the surroundings are reflected only on it's surface. On another level this is confronting the anxiety of finding your own personality and coming to terms with its fluid nature. The idea of self is much more complex than it first appears.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 15

Explorations Through Mourning

Presenter: Holly McDermott

Mentor: Beverly Seley

This work explores the ways in which we grieve for and come to terms with our own mortality. Historically there are many modes of dealing with death through art and literature. I am specifically interested in Memento Mori, a Latin phrase translating to "remember that you will die," which has a longtime tradition in the jewelry and metalsmithing field. With wire, I draw faces and tears as symbols of mourning as a human condition. The process of making serves to mend the grief I carry for lost loved ones. The grieving process is different for everyone. This is my interpretation.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 16

Moving Pieces

Presenter: Catherine Brieden

Mentor: Renee Zettle-Sterling

The process of crafting this piece is as methodical as the necklace itself. Originally inspired by a daisy chain, this necklace's chain was assembled from silver rods and tubing to create flowing and perpetual movement even when being worn. The pendant itself has suspended and moving parts to create a harmony within the entire piece. The stones, both citrine, are a unique display of both of the gems faceted and unfaceted forms, placed between moving pieces to give the necklace an anchor for the eye. My goal was to create a simple yet unique piece to wear, intriguing yet sophisticated.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 18 - DC

Regle necklaces

Presenter: Benjamin Symons

Mentor: Beverly Seley

These neckpieces reference forms in nature combined with bright geometric shapes. The contrast or tension created gives a regal yet humble appeal.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 19

Connecting Reality

Presenter: Lauren Tomsich

Mentor: Vinicius Rebello Lima

Connecting reality is a series of graphic images that show the unification of the real world and the abstract world.

This concept is portrayed through the graphics because each image is composed of a real-life photograph and a 2D letterform. They are combined such a way that the two elements look as though they could be one. The real-life photographs are of walls and buildings. These photographs help portray the concept that the barriers between the real and imaginary worlds are being broken down and the two worlds can combine. The series is filled with vibrant colors that display the liveliness and the freedom of thought that comes with the unification. The series is made up of five images that all contain elements of structure within them. This idea of having some structure is important with this concept because the abstract world is vast, and if we let our thoughts become too free, then it may disregard the laws.

Film / Video Abstracts & Schedule

9:00 AM - 5:00 PM Continuous Showing

Presenter(s) Available Beginning at 10:00 AM

MARY IDEMA PEW LIBRARY MAIN FLOOR VIDEO DISPLAY

Junior Achievement of the West Michigan Great Lakes

Presenter: Lauren Holt

Mentor: Suzanne Zack

This promotional video was created for the class Producing for Clients. The goal was to create a video for Junior Achievement that they could show to Grand Rapids community leaders in meetings to inspire them to donate to their amazing non-profit organization for funding for their Free Enterprise Center.

Presenter(s) Available Beginning at 12:00 PM

MARY IDEMA PEW LIBRARY MAIN FLOOR VIDEO DISPLAY

Alone: The Sicarius Games

Presenters: Nehemiah Hudgins-Lopez, Nicholas Ranger

Mentor: Julie Goldstein

Alone: The Sicarius Games is a product of GVSU students at GVTV. The film follows the story of a man who calls himself Sicarius, when he calls for people to kill for money in the joys of a game, and the world gets a bit scarier. A young detective comes along to solve the case, but can he convince people of his conspiracy before it catches up with him? *Alone: The Sicarius Games* is one of the only full length feature films to be made entirely by Grand Valley State students. The film, due to be released in September of 2018, will go to festivals and will seek a distribution deal through Speck TV.

Index of Presenters and Mentors

(Sorted by Last Name)

A

Abbott, Shelby	Student	11:00 a.m.	Henry Hall Atrium 084
Ahmad, Sabrina	Student	9:00 a.m.	Henry Hall Atrium 100
Ahmad, Sabrina	Student	11:00 a.m.	Kirkhof Center GRR 134
Aho, Brandon	Student	1:00 p.m.	Henry Hall Atrium 018
Aiken, Ashlin	Student	9:00 a.m.	Kirkhof Center GRR 067
Aldrich, Naomi J.	Mentor	9:00 a.m.	Henry Hall Atrium 037
Aldrich, Naomi J.	Mentor	9:00 a.m.	Kirkhof Center GRR 108
Aldrich, Naomi J.	Mentor	9:00 a.m.	Kirkhof Center GRR 002
Alger, Jordan	Student	2:00 p.m.	Henry Hall Atrium 085
Allen, Jessica	Student	4:00 p.m.	MIP Library Exhibition Space 10
Allison, Kaitlyn	Student	10:00 a.m.	Kirkhof Center 2263
Allor, Robert	Student	11:00 a.m.	Kirkhof Center GRR 032
Allor, Robert	Student	2:00 p.m.	Kirkhof Center GRR 123
Almosa, Abdulaziz	Student	3:00 p.m.	Henry Hall Atrium 069
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Ambrose, Bradley	Mentor	9:00 a.m.	Kirkhof Center GRR 116
Anderson, Amy	Student	10:30 a.m.	Kirkhof Center 1142
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Apostle, Stefanos	Student	11:30 a.m.	Kirkhof Center 2259
Armistead, Brooke	Student	9:00 a.m.	Kirkhof Center GRR 018
Armistead, Brooke	Student	1:00 p.m.	Kirkhof Center 2263
Armstrong, Allison	Student	10:00 a.m.	Henry Hall Atrium 101
Arney, Paige	Student	2:00 p.m.	Henry Hall Atrium 085
Aschenbach, Todd	Mentor	9:00 a.m.	Henry Hall Atrium 019
Audia, Ellen	Student	9:00 a.m.	Kirkhof Center GRR 098
Avery, Kyle	Student	1:00 p.m.	Kirkhof Center 1142
Avey, Christopher	Student	9:00 a.m.	Kirkhof Center GRR 075
Avgerinos, Samantha	Student	11:00 a.m.	Kirkhof Center GRR 147

B

Bainbridge, Caitlin	Student	2:00 p.m.	Henry Hall Atrium 080
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Bair, Mary	Mentor	9:30 a.m.	Kirkhof Center 2259
Baker, Taylor	Student	10:00 a.m.	Kirkhof Center GRR 164
Balcom, Gavin	Student	11:00 a.m.	Henry Hall Atrium 068
Barbot, Grayson	Student	11:00 a.m.	Henry Hall Atrium 042
Barnard, Haley	Student	11:00 a.m.	Kirkhof Center GRR 084
Barnes, Kyle	Mentor	9:00 a.m.	Henry Hall Atrium 099
Barnes, Kyle	Mentor	9:00 a.m.	Henry Hall Atrium 100
Barnes, Kyle	Mentor	9:00 a.m.	Henry Hall Atrium 101
Barnes, Kyle	Mentor	9:00 a.m.	Kirkhof Center GRR 066
Barnes, Kyle	Mentor	9:00 a.m.	Henry Hall Atrium 036
Barnes, Kyle	Mentor	9:00 a.m.	Kirkhof Center GRR 164
Bartes, Caroline	Student	9:00 a.m.	Kirkhof Center GRR 108
Bartes, Caroline	Student	9:00 a.m.	Kirkhof Center GRR 002
Basiliere, Jae	Mentor	9:30 a.m.	Kirkhof Center 2270
Basiliere, Jae	Mentor	11:00 a.m.	Kirkhof Center 2266
Basinski, Brian	Student	12:00 p.m.	Henry Hall Atrium 051
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Bates, Kayla	Student	10:00 a.m.	Henry Hall Atrium 013
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Baxter, Andrea	Student	10:00 a.m.	Kirkhof Center GRR 060
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Beery, John	Student	9:00 a.m.	Kirkhof Center 2263
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Beffel, Jenna	Student	9:00 a.m.	Kirkhof Center GRR 108
Beffel, Jenna	Student	9:00 a.m.	Kirkhof Center GRR 002
Beh, Joseph	Student	9:00 a.m.	Henry Hall Atrium 031
Behl, Samantha	Student	3:00 p.m.	Henry Hall Atrium 036
Beine, Mary	Student	9:00 a.m.	Kirkhof Center GRR 019
Bekkala, Jenna	Student	9:00 a.m.	Kirkhof Center GRR 108
Bekkala, Jenna	Student	9:00 a.m.	Kirkhof Center GRR 002
Bender, John	Mentor	9:00 a.m.	Kirkhof Center GRR 020
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Bender, John	Mentor	9:00 a.m.	Kirkhof Center GRR 143
Bender, John	Mentor	9:00 a.m.	Kirkhof Center GRR 122
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Bender, John	Mentor	9:00 a.m.	Henry Hall Atrium 017
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Berg, Mikaela	Student	1:00 p.m.	Kirkhof Center GRR 011
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Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 062
Bergman, Daniel	Mentor	9:00 a.m.	Henry Hall Atrium 088
Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 125
Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 117
Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 044
Bergman, Daniel	Mentor	9:00 a.m.	Henry Hall Atrium 038
Berry-Purnell, Dashay	Student	9:00 a.m.	Kirkhof Center 2270
Bertus, Sarah	Student	10:00 a.m.	Kirkhof Center GRR 088
Betway, Katlyn	Student	12:00 p.m.	Kirkhof Center GRR 064
Beyer, Ariel	Student	11:30 a.m.	Kirkhof Center 2270
Beyer, Carly	Student	3:00 p.m.	Henry Hall Atrium 005
Bigler, Alexis	Student	10:00 a.m.	Kirkhof Center GRR 054
Biros, Shannon	Mentor	9:00 a.m.	Kirkhof Center GRR 136
Biros, Shannon	Mentor	12:00 p.m.	Kirkhof Center 2259
Blackman, Sheila	Mentor	9:00 a.m.	Kirkhof Center GRR 075
Blais, Leiu	Student	11:00 a.m.	Kirkhof Center 1142
Bolen, Allison	Student	9:00 a.m.	Henry Hall Atrium 053
Bolen, Brett	Mentor	9:00 a.m.	Kirkhof Center GRR 047
Bommarito, Rachel	Student	9:00 a.m.	Kirkhof Center GRR 019
Bonner, Kari	Student	3:00 p.m.	Henry Hall Atrium 033
Boogaart, Jacob	Student	2:00 p.m.	Kirkhof Center 1104
Booker, Aikelah	Student	1:00 p.m.	Kirkhof Center 1142
Borja, Andrew	Student	11:00 a.m.	Henry Hall Atrium 099
Born, Gabriella	Student	11:00 a.m.	Kirkhof Center GRR 101
Borucki, Lauren	Student	11:00 a.m.	Kirkhof Center GRR 084
Bost, Brianna	Student	1:00 p.m.	Kirkhof Center GRR 049
Bourke, Marie	Student	12:00 p.m.	Kirkhof Center GRR 146
Bozman, Felicia	Student	1:00 p.m.	Kirkhof Center GRR 006
Brace, Isaac	Student	9:00 a.m.	Kirkhof Center GRR 151
Branch, Emma	Student	10:00 a.m.	Kirkhof Center GRR 102
Breems, Graeme	Student	9:30 a.m.	Kirkhof Center 1104

Brereton, Caroline	Student	10:00 a.m.	Kirkhof Center GRR 125
Brieden, Catherine	Student	4:00 p.m.	MIP Library Exhibition Space 16
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Britton, Rachel	Student	4:00 p.m.	MIP Library Exhibition Space 01
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Bronicki, David	Student	11:00 a.m.	Kirkhof Center GRR 047
Brougham, Sydney	Student	11:00 a.m.	Kirkhof Center GRR 079
Brown, Melina	Student	11:00 a.m.	Kirkhof Center 2263
Brown, Nicholas	Student	1:00 p.m.	Henry Hall Atrium 083
Bruins, Cassidy	Student	11:00 a.m.	Kirkhof Center GRR 115
Buchheit, Andrew	Student	9:00 a.m.	Henry Hall Atrium 075
Buehler, Marissa	Student	9:00 a.m.	Henry Hall Atrium 102
Bulson, Timothy	Mentor	9:00 a.m.	Henry Hall Atrium 057
Burd, Alysha	Student	2:00 p.m.	Kirkhof Center GRR 015
Burg, Martin	Mentor	9:00 a.m.	Kirkhof Center GRR 006
Burg, Martin	Mentor	9:00 a.m.	Kirkhof Center GRR 011
Burg, Martin	Mentor	9:00 a.m.	Kirkhof Center GRR 140
Burg, Martin	Mentor	9:00 a.m.	Henry Hall Atrium 032
Burns, Madeline	Student	10:00 a.m.	Henry Hall Atrium 019
Burt, Ashton	Student	10:00 a.m.	Kirkhof Center 1142
Bussiere, Krystin	Student	9:00 a.m.	Henry Hall Atrium 011
Butkis, Elizabeth	Student	12:00 p.m.	Kirkhof Center 1142

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Cai, Meghan	Mentor	11:30 a.m.	Kirkhof Center 2270
Calhoun, Lyndsie	Student	9:00 a.m.	Henry Hall Atrium 031
Campbell, Noah	Student	1:30 p.m.	Kirkhof Center 2259
Capodilupo, John	Mentor	9:00 a.m.	Kirkhof Center GRR 050
Capodilupo, John	Mentor	9:00 a.m.	Henry Hall Atrium 007
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Capulong, Zachary	Student	2:00 p.m.	Henry Hall Atrium 028
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Chang, Sophia	Student	9:00 a.m.	Kirkhof Center GRR 089

Chant, Megan	Student	9:30 a.m.	Kirkhof Center 1142
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Chriss, Olivia	Student	3:30 p.m.	Kirkhof Center 2270
Christoffersen, Hana	Student	10:00 a.m.	Kirkhof Center GRR 068
Christoffersen, Hana	Student	10:00 a.m.	Henry Hall Atrium 019
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Clark, Matthew	Student	11:00 a.m.	Kirkhof Center GRR 085
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Cleary, Ian	Mentor	9:00 a.m.	Kirkhof Center GRR 071
Cleary, Ian	Mentor	9:00 a.m.	Kirkhof Center GRR 153
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Cloeter, Renee	Student	12:00 p.m.	Kirkhof Center GRR 130
Cloy, Robert	Student	4:00 p.m.	Kirkhof Center 1104
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Cole, Jamie	Student	2:00 p.m.	Henry Hall Atrium 098
Cook, Paul	Mentor	9:00 a.m.	Henry Hall Atrium 108
Cook, Paul	Mentor	9:00 a.m.	Kirkhof Center GRR 141
Cooper, Samantha	Student	2:30 p.m.	Kirkhof Center 1104
Corker, Katherine	Mentor	9:00 a.m.	Kirkhof Center GRR 015
Crane, David	Mentor	9:00 a.m.	Kirkhof Center GRR 038
Crawford, Jessica	Student	9:00 a.m.	Kirkhof Center GRR 114
Crocenzi, Alexandra	Student	11:00 a.m.	Kirkhof Center GRR 021
Cucchi, Justine	Student	12:00 p.m.	Kirkhof Center 2266
Curry, Cody	Student	11:00 a.m.	Henry Hall Atrium 039
Cwick, Jaclyn	Mentor	9:00 a.m.	Kirkhof Center 2270

D

D'Annibale, Christiana	Student	1:00 p.m.	Kirkhof Center GRR 003
Damstra, Kelli	Mentor	9:00 a.m.	Kirkhof Center GRR 091
Damstra, Kelli	Mentor	9:00 a.m.	Henry Hall Atrium 050
Dandron, Jane	Student	4:00 p.m.	MIP Library Exhibition Space 05
Daniels, Jarred	Student	12:30 p.m.	Kirkhof Center 2259
Darin, Rachel	Student	9:00 a.m.	Kirkhof Center GRR 083
Daugherty, Brittany	Student	9:30 a.m.	Kirkhof Center 1142
David, Kenneth	Student	10:00 a.m.	Henry Hall Atrium 096
Davignon, Mitchell	Student	11:00 a.m.	Henry Hall Atrium 078
Davis, Kathryn	Student	11:30 a.m.	Kirkhof Center 2266

Davis, Lindsay	Student	9:00 a.m.	Kirkhof Center GRR 148
Davis, Rebecca	Mentor	9:00 a.m.	Kirkhof Center GRR 124
De Vries, Dawn	Mentor	9:00 a.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	9:30 a.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	10:00 a.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	10:30 a.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	11:00 a.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	11:30 a.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	12:00 p.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	12:30 p.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	1:00 p.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	1:30 p.m.	Kirkhof Center 1142
De Windt, Nicole	Student	3:00 p.m.	Henry Hall Atrium 047
DeLano-Taylor, Merritt	Mentor	9:00 a.m.	Henry Hall Atrium 040
DeMuth, Danielle	Mentor	9:00 a.m.	Kirkhof Center GRR 039
DeMuth, Danielle	Mentor ¹	2:00 p.m.	Kirkhof Center 2270
DeWeerd, Aaron	Student	9:00 a.m.	Henry Hall Atrium 029
DeWeerd, Danielle	Student	10:00 a.m.	Kirkhof Center GRR 160
DeWitt, Alyssa	Student	9:00 a.m.	Kirkhof Center GRR 025
DeWitt, Ashley	Student	9:00 a.m.	Kirkhof Center GRR 025
Dean, Kristy	Mentor	9:00 a.m.	Henry Hall Atrium 059
Deaner, Robert	Mentor	9:00 a.m.	Henry Hall Atrium 052
Debellis, Miranda	Student	12:00 p.m.	Kirkhof Center GRR 062
Decker, Tara	Student	1:00 p.m.	Henry Hall Atrium 066
Deemer, Gregory	Student	10:00 a.m.	Kirkhof Center GRR 044
Degenhardt, Michael	Student	9:00 a.m.	Kirkhof Center GRR 067
Degroat, Brittney	Student	1:00 p.m.	Henry Hall Atrium 026
Depew, Jeffrey	Student	1:00 p.m.	Henry Hall Atrium 028
Derror, Tanner	Student	2:00 p.m.	Kirkhof Center 2270
Desgranges, Jackson	Student	9:00 a.m.	Henry Hall Atrium 109
Dewey, Nicholas	Student	10:00 a.m.	Kirkhof Center GRR 028
Di Girolamo, Eleanor	Student	10:00 a.m.	Kirkhof Center GRR 028
Di Girolamo, Eleanor	Student	11:00 a.m.	Kirkhof Center GRR 120
Dietrich, Margaret	Mentor	9:00 a.m.	Kirkhof Center GRR 133
Dietz, Phillip	Student	9:00 a.m.	Kirkhof Center GRR 007
Dietz, Phillip	Student	12:00 p.m.	Kirkhof Center GRR 122
Dillard, Amanda	Mentor	9:00 a.m.	Kirkhof Center GRR 055
Doherty, Morgan	Student	3:00 p.m.	Kirkhof Center GRR 093

Dolan, Chase	Student	9:30 a.m.	Kirkhof Center 2259
Dolley, Joseph	Student	9:00 a.m.	Kirkhof Center GRR 150
Doran, Emily	Student	4:00 p.m.	Kirkhof Center 2263
Dowling, Samantha	Student	1:00 p.m.	Kirkhof Center 1142
Dubay, Olivia	Student	12:00 p.m.	Kirkhof Center GRR 055
Dubisky, Allysen	Student	9:00 a.m.	Henry Hall Atrium 060
Dubisky, Allysen	Student	3:00 p.m.	Kirkhof Center GRR 031
Dueker, Gwenden	Mentor	9:00 a.m.	Henry Hall Atrium 013
Duong, Tony	Student	3:30 p.m.	Kirkhof Center 1104
Durham, Andra	Student	9:00 a.m.	Kirkhof Center GRR 057

E

Efting, Claire	Student	10:00 a.m.	Kirkhof Center GRR 023
Elliott, Abigail	Student	12:00 p.m.	Henry Hall Atrium 076
Elrod, Genevieve	Mentor	9:00 a.m.	Kirkhof Center 2259
Elsholz, Christina	Student	9:00 a.m.	Kirkhof Center GRR 069
Engelsma, Jonathan	Mentor	9:00 a.m.	Kirkhof Center GRR 013
Erickson, Katelyn	Student	3:00 p.m.	Henry Hall Atrium 036
Eslick, Jared	Student	9:00 a.m.	Kirkhof Center GRR 029
Eslick, Jared	Student	10:00 a.m.	Kirkhof Center GRR 160
Eslick, Stephanie	Student	9:00 a.m.	Henry Hall Atrium 012
Esselink, Madison	Student	9:00 a.m.	Kirkhof Center GRR 090
Eubank, Autumn	Student	11:00 a.m.	Kirkhof Center GRR 115
Evans, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 043

F

Farris, Gary	Student	9:00 a.m.	Kirkhof Center GRR 034
Feist, Aileen	Student	1:00 p.m.	Kirkhof Center 1142
Ferguson, Joshua	Student	9:00 a.m.	Kirkhof Center GRR 072
Ferguson, Roger	Mentor	9:00 a.m.	Kirkhof Center GRR 099
Ferguson, Roger	Mentor	9:00 a.m.	Kirkhof Center GRR 109
Fischer, Micaela	Student	11:00 a.m.	Henry Hall Atrium 068
Fish, Erin	Student	10:00 a.m.	Kirkhof Center GRR 074
Flaherty, Shannon	Student	9:00 a.m.	Henry Hall Atrium 024
Flandreau, Elizabeth	Mentor	9:00 a.m.	Henry Hall Atrium 075
Force, Victoria	Student	4:30 p.m.	Kirkhof Center 2266
Ford, Jacob	Student	10:00 a.m.	Henry Hall Atrium 045
Forest, Erika	Student	11:00 a.m.	Kirkhof Center GRR 158
Fortes Gonzalez, Mayra	Mentor	11:00 a.m.	Kirkhof Center 2263
Fortier, Miranda	Student	11:00 a.m.	Kirkhof Center GRR 016

Forton, Kasey	Student	9:00 a.m.	Kirkhof Center GRR 025
Foster, Sean	Student	10:30 a.m.	Kirkhof Center 2266
Fox, Audrey	Student	1:00 p.m.	Kirkhof Center GRR 038
Frank, Conrad	Student	3:00 p.m.	Kirkhof Center GRR 024
Franklin, Briana	Student	10:00 a.m.	Kirkhof Center GRR 126
Frantzeskakis, Melina	Student	1:00 p.m.	Henry Hall Atrium 040
Freeman, Collin	Student	11:00 a.m.	Kirkhof Center GRR 045
Freiburger, Andrew	Student	9:00 a.m.	Henry Hall Atrium 020
Freiman, Andrew	Student	1:00 p.m.	Kirkhof Center GRR 133
Freybler, Josephine	Student	1:00 p.m.	Kirkhof Center GRR 103
Furton, Douglas	Mentor	9:00 a.m.	Henry Hall Atrium 096
Furton, Douglas	Mentor	9:00 a.m.	Kirkhof Center GRR 138

G

Gabrosek, John	Mentor	4:30 p.m.	Kirkhof Center 2266
Gaffka, Katarina	Student	11:00 a.m.	Kirkhof Center GRR 134
Galea, Jonathan	Student	11:00 a.m.	Kirkhof Center GRR 041
Galen, Luke	Mentor	9:00 a.m.	Kirkhof Center GRR 106
Gallagher, Brenna	Student	12:30 p.m.	Kirkhof Center 1142
Geene, Alicia	Student	9:00 a.m.	Henry Hall Atrium 024
Gerhold, Emma	Student	11:00 a.m.	Henry Hall Atrium 046
Gillham, Alta	Student	11:00 a.m.	Henry Hall Atrium 038
Glass, Stephen	Mentor	9:00 a.m.	Kirkhof Center GRR 134
Glidden, Ashley	Student	12:00 p.m.	Kirkhof Center 1142
Godair, Danielle	Student	12:00 p.m.	Kirkhof Center GRR 130
Goethals, Sam	Student	9:00 a.m.	Henry Hall Atrium 104
Goldstein, Julie	Mentor	12:00 p.m.	MIP LIB Main Floor Video Display
Goldstein, Julie	Mentor	1:30 p.m.	Kirkhof Center 2259
Golus, Francesca	Student	4:00 p.m.	Henry Hall Atrium 092
Gonzalez, Jessalyn	Student	9:00 a.m.	Henry Hall Atrium 102
Gordon, Rebecca	Student	11:00 a.m.	Kirkhof Center GRR 142
Gottardo, Genevieve	Student	3:00 p.m.	Henry Hall Atrium 036
Gove, Hannah	Student	11:00 a.m.	Kirkhof Center GRR 134
Goy, Megan	Student	9:00 a.m.	Kirkhof Center GRR 075
Gracias, Meridell	Mentor	9:00 a.m.	Henry Hall Atrium 043
Gracias, Meridell	Mentor	9:00 a.m.	Kirkhof Center GRR 004
Gracias, Meridell	Mentor	9:00 a.m.	Kirkhof Center GRR 084
Graham, Douglas	Mentor	9:00 a.m.	Henry Hall Atrium 056
Grant, Avery	Student	9:00 a.m.	Kirkhof Center 1142

Green, Emma	Student	9:30 a.m.	Kirkhof Center 1142
Green, Jillian	Student	10:00 a.m.	Henry Hall Atrium 056
Greer, Gary	Mentor	9:00 a.m.	Kirkhof Center GRR 036
Greer, Gary	Mentor	9:00 a.m.	Kirkhof Center GRR 042
Greer, Gary	Mentor	9:00 a.m.	Kirkhof Center GRR 043
Gregart, Sydney	Student	11:00 a.m.	Henry Hall Atrium 005
Gregory, Vashti	Student	11:00 a.m.	Kirkhof Center GRR 045
Grey, Joshua	Student	10:00 a.m.	Henry Hall Atrium 073
Griffin, Carol	Mentor	9:00 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	9:30 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	10:00 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	10:30 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	11:00 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	11:30 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	2:00 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	2:30 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	3:00 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	3:30 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	4:00 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	4:30 p.m.	Kirkhof Center 1104
Griswold, Ashten	Student	9:00 a.m.	Kirkhof Center GRR 163
Gross, Jennifer	Mentor	9:00 a.m.	Kirkhof Center GRR 090
Grove, Ellen	Student	11:00 a.m.	Kirkhof Center GRR 163
Grunwald, Dirk	Mentor	9:00 a.m.	Kirkhof Center GRR 077
Grydehoj, Rasmus	Student	10:00 a.m.	Henry Hall Atrium 013
Gulbis, Caitlin	Student	1:00 p.m.	Henry Hall Atrium 026
Gulgin, Heather	Mentor	9:00 a.m.	Kirkhof Center GRR 103
Gustin, Nicole	Student	9:00 a.m.	Henry Hall Atrium 009
Gustin, Nicole	Student	9:00 a.m.	Henry Hall Atrium 043
Gustin, Nicole	Student	11:00 a.m.	Kirkhof Center GRR 004
Gustin, Nicole	Student	11:00 a.m.	Kirkhof Center GRR 084
Guy, Jarren	Student	9:00 a.m.	Kirkhof Center GRR 150
Gyorkos, Amy	Mentor	9:00 a.m.	Henry Hall Atrium 005
Gyorkos, Amy	Mentor	9:00 a.m.	Henry Hall Atrium 024
Gyorkos, Amy	Mentor	9:00 a.m.	Henry Hall Atrium 028
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 019
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 147
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 148

Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 150
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 152

H

Hahs, Emma	Student	9:00 a.m.	Kirkhof Center 2266
Hales, Zakkaria	Student	9:00 a.m.	Kirkhof Center GRR 046
Haley, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 041
Halick, Erica	Student	1:00 p.m.	Henry Hall Atrium 026
Hamel, Emily	Student	10:00 a.m.	Henry Hall Atrium 001
Hamilton, Sophia	Student	9:00 a.m.	Kirkhof Center GRR 081
Hansen, Alexis	Student	9:00 a.m.	Henry Hall Atrium 012
Harbin, Kaitlin	Student	12:30 p.m.	Kirkhof Center 1142
Harley, Alicia	Student	11:00 a.m.	Kirkhof Center 2263
Harrah, Ashleigh	Student	1:00 p.m.	Kirkhof Center 2263
Harrington, Susan	Mentor	9:00 a.m.	Kirkhof Center GRR 100
Harris, Jacob	Student	1:00 p.m.	Kirkhof Center GRR 063
Harris, Jacob	Student	1:00 p.m.	Kirkhof Center GRR 080
Hart, Matthew	Mentor	9:00 a.m.	Henry Hall Atrium 014
Hart, Matthew	Mentor	9:00 a.m.	Kirkhof Center GRR 007
Hartline, Courtney	Student	1:30 p.m.	Kirkhof Center 2270
Hartt, Kali	Student	11:00 a.m.	Henry Hall Atrium 042
Hauke, Montana	Student	9:00 a.m.	Henry Hall Atrium 102
Haven, Christopher	Mentor	10:00 a.m.	Kirkhof Center 2259
Haven, Christopher	Mentor	11:30 a.m.	Kirkhof Center 2266
Hecht, Bryce	Student	10:30 a.m.	Kirkhof Center 2259
Hedges, Kristin	Mentor	9:00 a.m.	Kirkhof Center GRR 110
Hefferan, Tara	Mentor	9:00 a.m.	Kirkhof Center GRR 057
Heine, Alexandra	Student	4:00 p.m.	Henry Hall Atrium 008
Helmer, Ross	Student	10:00 a.m.	Henry Hall Atrium 081
Helmer, Ross	Student	10:00 a.m.	Kirkhof Center GRR 155
Helms, Jacob	Student	9:00 a.m.	Henry Hall Atrium 024
Hendricks, Lauren	Student	11:00 a.m.	Henry Hall Atrium 084
Henke, Dellas	Mentor	4:00 p.m.	MIP Library Exhibition Space 05
Henry, David	Student	9:00 a.m.	Kirkhof Center GRR 022
Henshaw, Michael	Mentor	9:00 a.m.	Henry Hall Atrium 001
Henshaw, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 081
Henson, Samuel	Student	2:00 p.m.	Henry Hall Atrium 095
Hey, Kayla	Student	9:00 a.m.	Kirkhof Center 2263
Hey, Kayla	Student	12:00 p.m.	Kirkhof Center GRR 055

Heyburn, Emily	Student	2:00 p.m.	Kirkhof Center GRR 012
Heys, McKensey	Student	9:00 a.m.	Kirkhof Center 1142
Hiestand, Samuel	Student	3:00 p.m.	Henry Hall Atrium 091
Higbea, Raymond	Mentor	9:00 a.m.	Henry Hall Atrium 098
Hill, David	Student	1:00 p.m.	Kirkhof Center GRR 138
Hill, Kristi	Student	9:00 a.m.	Kirkhof Center GRR 085
Hill, Zach	Student	9:00 a.m.	Henry Hall Atrium 104
Hippensteel, Rebecca	Student	11:00 a.m.	Kirkhof Center 1104
Hodges, Hannah	Student	10:00 a.m.	Kirkhof Center GRR 042
Holder, Benjamin	Mentor	9:00 a.m.	Kirkhof Center GRR 056
Hollister, Robert	Mentor	9:00 a.m.	Kirkhof Center GRR 063
Hollister, Robert	Mentor	9:00 a.m.	Kirkhof Center GRR 064
Hollister, Robert	Mentor	9:00 a.m.	Kirkhof Center GRR 068
Hollister, Robert	Mentor	9:00 a.m.	Kirkhof Center GRR 073
Hollister, Robert	Mentor	9:00 a.m.	Kirkhof Center GRR 080
Holt, Lauren	Student	10:00 a.m.	MIP LIB Main Floor Video Display
Hoogstra, Wendy	Student	9:00 a.m.	Kirkhof Center GRR 067
Hook, Casey	Student	11:00 a.m.	Kirkhof Center GRR 147
Hosea, Mark	Student	9:00 a.m.	Henry Hall Atrium 011
Houchlei, Joshua	Student	4:00 p.m.	MIP Library Exhibition Space 03
Houghton-Rahrig, Lori	Mentor	9:00 a.m.	Kirkhof Center GRR 033
Houghton-Rahrig, Lori	Mentor	9:00 a.m.	Henry Hall Atrium 074
Howe, Jacob	Student	9:00 a.m.	Kirkhof Center GRR 140
Hrnyak, Vincent	Student	10:00 a.m.	Kirkhof Center GRR 160
Hrnyak, Vincent	Student	11:00 a.m.	Kirkhof Center GRR 070
Hudgins-Lopez, Nehemiah	Student	12:00 p.m.	MIP LIB Main Floor Video Display
Hudson, Michael	Student	10:00 a.m.	Kirkhof Center 2266
Hudson, Michael	Student	12:00 p.m.	Kirkhof Center 2259
Hughes, Kevin	Student	10:00 a.m.	Kirkhof Center GRR 051
Hughey, Cory	Student	10:00 a.m.	Henry Hall Atrium 081
Huizinga, Grace	Mentor	9:00 a.m.	Henry Hall Atrium 009
Huizinga, Grace	Mentor	9:00 a.m.	Kirkhof Center GRR 088
Hulan, Haley	Student	12:00 p.m.	Kirkhof Center 2270
Huner, Michael	Mentor	1:00 p.m.	Kirkhof Center 2270
Hunt, Jodee	Mentor	9:00 a.m.	Henry Hall Atrium 092
Hunt, Jodee	Mentor	9:00 a.m.	Kirkhof Center GRR 014
Hunter, Haleigh	Student	10:00 a.m.	Henry Hall Atrium 008
Hutchings, Robin	Student	9:00 a.m.	Henry Hall Atrium 034

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Idoni, Madison	Student	11:00 a.m.	Kirkhof Center 1142
Ippel, David	Student	9:00 a.m.	Kirkhof Center GRR 066
Irwin, Katherine	Student	4:00 p.m.	MIP Library Exhibition Space 09
Irwin, Victoria	Student	9:00 a.m.	Henry Hall Atrium 048

J

Janiga, Mark	Student	9:00 a.m.	Henry Hall Atrium 110
Janiga, Nicole	Student	1:00 p.m.	Henry Hall Atrium 112
Jawara, Sarah	Student	10:00 a.m.	Henry Hall Atrium 005
Jevtovic, Filip	Student	11:00 a.m.	Henry Hall Atrium 044
Johns, Katlyn	Student	1:00 p.m.	Henry Hall Atrium 004
Johnson, Delaney	Student	9:00 a.m.	Henry Hall Atrium 087
Jorden, Rose	Student	10:00 a.m.	Kirkhof Center GRR 126
Jose, Laurence	Mentor	9:00 a.m.	Kirkhof Center GRR 087
Juzwiak, Jordan	Student	9:00 a.m.	Kirkhof Center GRR 152
Juzwiak, Jordan	Student	3:00 p.m.	Henry Hall Atrium 036

K

Kares, Andi	Student	9:00 a.m.	Kirkhof Center GRR 046
Kares, Andi	Student	11:00 a.m.	Kirkhof Center GRR 161
Karpen, Mary	Mentor	9:00 a.m.	Kirkhof Center GRR 026
Kasmer, Lisa	Mentor	9:00 a.m.	Henry Hall Atrium 010
Kavner, Lauren	Student	12:00 p.m.	Henry Hall Atrium 088
Kayfish, Alex	Student	9:00 a.m.	Kirkhof Center GRR 081
Keeley, Olivia	Student	9:00 a.m.	Kirkhof Center GRR 152
Keenan-Whittemore, Kailey	Student	1:00 p.m.	Kirkhof Center GRR 080
Keller, Rachel	Student	1:00 p.m.	Henry Hall Atrium 066
Kelley, Cory	Student	11:00 a.m.	Kirkhof Center GRR 040
Kelly Lowenstein, Jeffrey	Mentor	1:30 p.m.	Kirkhof Center 2270
Kelly Lowenstein, Jeffrey	Mentor	2:00 p.m.	Kirkhof Center 2259
Kennedy, Morgan	Student	12:00 p.m.	Henry Hall Atrium 086
Kenny, Alanna	Student	11:00 a.m.	Henry Hall Atrium 108
Kenyon, Alena	Student	10:00 a.m.	Kirkhof Center 2259
Kenyon, Lisa	Mentor	9:00 a.m.	Henry Hall Atrium 037
Keough, Lauren	Mentor	9:00 a.m.	Henry Hall Atrium 027
Keough, Lauren	Mentor	9:00 a.m.	Kirkhof Center GRR 094
Keough, Lauren	Mentor	9:00 a.m.	Kirkhof Center GRR 163
Kern, Breanna	Student	9:00 a.m.	Kirkhof Center GRR 152
Khoo, Sok Kean	Mentor	9:00 a.m.	Kirkhof Center 2266

Khoo, Sok Kean	Mentor	9:00 a.m.	Henry Hall Atrium 003
Khoo, Sok Kean	Mentor	9:00 a.m.	Kirkhof Center GRR 018
Khoo, Sok Kean	Mentor	9:00 a.m.	Kirkhof Center GRR 119
Khoo, Sok Kean	Mentor	11:00 a.m.	Kirkhof Center 2270
Khoo, Sok Kean	Mentor	1:00 p.m.	Kirkhof Center 2263
Kiessel, Tanner	Student	10:00 a.m.	Kirkhof Center GRR 090
Kilborn, James	Student	9:00 a.m.	Henry Hall Atrium 041
King, Lauren	Student	1:00 p.m.	Henry Hall Atrium 105
King, Sarah	Mentor	10:30 a.m.	Kirkhof Center 2266
Kinne, Claire	Student	12:00 p.m.	Kirkhof Center GRR 162
Kinney, Luke	Student	9:00 a.m.	Henry Hall Atrium 024
Kipp, Brian	Mentor	9:00 a.m.	Kirkhof Center GRR 135
Kirwin, Regina	Student	4:00 p.m.	Kirkhof Center GRR 091
Knapp, Jared	Student	11:00 a.m.	Henry Hall Atrium 044
Knauber, Lindsay	Student	10:00 a.m.	Kirkhof Center GRR 160
Kneeshaw, Tara	Mentor	9:00 a.m.	Henry Hall Atrium 083
Knight, Sylvia	Student	1:00 p.m.	Henry Hall Atrium 028
Knopf, Gerrit	Student	11:00 a.m.	Kirkhof Center GRR 078
Koch, Samantha	Student	9:00 a.m.	Kirkhof Center GRR 116
Koch Larue, Casey	Student	2:00 p.m.	Kirkhof Center GRR 105
Koirala, Aakriti	Student	9:00 a.m.	Henry Hall Atrium 050
Kolatski, Sierra	Student	3:00 p.m.	Kirkhof Center 1104
Kondyles, Loukas N.	Student	9:00 a.m.	Henry Hall Atrium 031
Konell, Ty	Student	11:00 a.m.	Kirkhof Center GRR 039
Kopperl, Sheldon	Mentor	9:00 a.m.	Kirkhof Center GRR 016
Kopperl, Sheldon	Mentor	9:00 a.m.	Kirkhof Center GRR 097
Kopperl, Sheldon	Mentor	9:00 a.m.	Henry Hall Atrium 008
Korman, Kyle	Student	10:00 a.m.	Henry Hall Atrium 090
Korman, Kyle	Student	2:00 p.m.	Henry Hall Atrium 017
Kovacs, Christine	Student	9:00 a.m.	Kirkhof Center GRR 087
Kovacs, Dalila	Mentor	9:00 a.m.	Henry Hall Atrium 020
Koviak, Cassidy	Student	9:00 a.m.	Kirkhof Center GRR 019
Kramer, Bryce	Student	10:00 a.m.	Henry Hall Atrium 056
Kranker, Michael	Student	9:00 a.m.	Kirkhof Center GRR 099
Krueger, Caleb	Student	9:00 a.m.	Kirkhof Center GRR 073
Krupp, Kara	Student	10:00 a.m.	Kirkhof Center GRR 008
Kruskie, Megan	Student	3:30 p.m.	Kirkhof Center 2259
Kucharski, Emily	Student	11:30 a.m.	Kirkhof Center 1104

Kunzi, Ross	Student	9:00 a.m.	Henry Hall Atrium 021
Kurjiaka, David	Mentor	9:00 a.m.	Henry Hall Atrium 029
Kurjiaka, David	Mentor	9:00 a.m.	Kirkhof Center GRR 086

L

LaDuca, Andrew	Student	2:00 p.m.	Kirkhof Center GRR 136
LaDuca, Andrew	Student	3:00 p.m.	Henry Hall Atrium 093
Labine, Ryan	Student	4:00 p.m.	MIP Library Exhibition Space 13
Lachman, Benjamin	Student	10:30 a.m.	Kirkhof Center 1104
Laframboise, Ashley	Student	10:00 a.m.	Henry Hall Atrium 066
Lake, Betsy	Student	4:00 p.m.	Kirkhof Center 2263
Lamb, Makenzie	Student	11:00 a.m.	Henry Hall Atrium 084
Lange, Benjamin	Student	9:00 a.m.	Kirkhof Center GRR 148
Langenberg, Alyssa	Student	10:00 a.m.	Henry Hall Atrium 013
Lansky, Kyra	Student	3:30 p.m.	Kirkhof Center 2270
Lantz, Andrew	Mentor	9:00 a.m.	Kirkhof Center GRR 010
Larson, Eleanore	Student	10:00 a.m.	Kirkhof Center GRR 155
Larson, Jayme	Student	11:00 a.m.	Kirkhof Center GRR 100
Laughter, Anna	Student	9:30 a.m.	Kirkhof Center 1142
LeBeau, Taylor	Student	2:00 p.m.	Henry Hall Atrium 085
Lechnar, Anaya	Student	9:00 a.m.	Kirkhof Center GRR 150
Lee, Joanna	Student	11:00 a.m.	Kirkhof Center GRR 079
Leiras, Claudia	Mentor	1:30 p.m.	Kirkhof Center 2266
Lenters, Geoffrey	Mentor	9:00 a.m.	Kirkhof Center GRR 159
Lenters, Geoffrey	Mentor	9:00 a.m.	Henry Hall Atrium 021
Lentine, Valerie	Student	1:00 p.m.	Henry Hall Atrium 077
Levack, Ethan	Student	1:00 p.m.	Henry Hall Atrium 077
Lewis, Kari	Student	4:30 p.m.	Kirkhof Center 1104
Li, Zhuoyang	Student	3:00 p.m.	Henry Hall Atrium 062
Linn, David	Mentor	9:00 a.m.	Henry Hall Atrium 006
Lioubimtseva, Elena	Mentor	9:00 a.m.	Henry Hall Atrium 022
Lioubimtseva, Elena	Mentor	9:00 a.m.	Henry Hall Atrium 025
Lioubimtseva, Elena	Mentor	9:00 a.m.	Henry Hall Atrium 030
Lioubimtseva, Elena	Mentor	9:00 a.m.	Henry Hall Atrium 091
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 005
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 034
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 045
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 046
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 129

Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 145
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 161
Lioubimtseva, Elena	Mentor	1:00 p.m.	Kirkhof Center 2259
Liu, Ruijie	Mentor	9:00 a.m.	Kirkhof Center GRR 111
Liu, Ruijie	Mentor	9:00 a.m.	Kirkhof Center GRR 003
LoPresto, Sam	Student	2:00 p.m.	Kirkhof Center GRR 127
Lombardo, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 008
Lombardo, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 120
Lord, Richard	Mentor	9:00 a.m.	Henry Hall Atrium 110
Lord, Richard	Mentor	9:00 a.m.	Kirkhof Center GRR 028
Lord, Richard	Mentor	9:00 a.m.	Kirkhof Center GRR 132
Lou, Leon	Mentor	9:00 a.m.	Henry Hall Atrium 031
Lown, Deborah	Mentor	9:00 a.m.	Kirkhof Center GRR 082
Lown, Deborah	Mentor	9:00 a.m.	Kirkhof Center GRR 139
Lozon, Elizabeth	Student	12:00 p.m.	Kirkhof Center GRR 130

M

MacKay, Samantha	Mentor	9:00 a.m.	Kirkhof Center GRR 062
MacKay, Samantha	Mentor	9:00 a.m.	Kirkhof Center GRR 044
MacKay, Samantha	Student	10:00 a.m.	Kirkhof Center GRR 125
Machniak, Emily	Student	9:00 a.m.	Kirkhof Center GRR 163
Mackey, Danielle	Student	9:00 a.m.	Kirkhof Center GRR 113
Madden, Gwyn	Mentor	9:00 a.m.	Kirkhof Center GRR 127
Madden, Gwyn	Mentor	9:00 a.m.	Kirkhof Center GRR 009
Magusin, Jacqueline	Student	3:00 p.m.	Henry Hall Atrium 036
Makuch, Sadie	Student	10:00 a.m.	Kirkhof Center 1142
Maleszyk, Michael	Student	2:30 p.m.	Kirkhof Center 2259
Maley, Morgan	Student	11:00 a.m.	Kirkhof Center GRR 106
Manderscheid, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 095
Mannor, Emily	Student	10:30 a.m.	Kirkhof Center 1142
Mansour, Pauline	Student	12:00 p.m.	Kirkhof Center GRR 122
Mantri, Jidnyasa	Student	10:00 a.m.	Kirkhof Center GRR 061
Maouene-Cavin, Josita	Mentor	9:00 a.m.	Henry Hall Atrium 012
Mara, Joslyn	Student	11:00 a.m.	Kirkhof Center GRR 118
Marsden, Daniel	Student	11:00 a.m.	Kirkhof Center GRR 117
Marshall, Liyah	Student	10:00 a.m.	Henry Hall Atrium 013
Marshall, Liyah	Student	10:00 a.m.	Henry Hall Atrium 035
Martin, Sydney	Student	4:00 p.m.	Henry Hall Atrium 049
Martiradonna, Julia	Student	12:00 p.m.	Kirkhof Center GRR 071

Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 049
Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 058
Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 039
Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 076
Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 128
Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 121
Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 035
Mason, Julia	Mentor	9:30 a.m.	Kirkhof Center 2266
Mason, Julia	Mentor	12:30 p.m.	Kirkhof Center 2259
Matchett, Stephen	Mentor	9:00 a.m.	Henry Hall Atrium 093
Mathews, Dakota	Student	11:00 a.m.	Kirkhof Center GRR 115
Mathis, Brittany	Student	11:30 a.m.	Kirkhof Center 1142
Mattingly, Tori	Student	9:00 a.m.	Henry Hall Atrium 024
Matusiak, Paige	Student	12:00 p.m.	Kirkhof Center GRR 050
Mayers, Leifa	Mentor	9:00 a.m.	Kirkhof Center GRR 035
Mayers, Leifa	Mentor	9:00 a.m.	Kirkhof Center GRR 039
Mayers, Leifa	Mentor	9:00 a.m.	Kirkhof Center GRR 049
Mayers, Leifa	Mentor	9:00 a.m.	Kirkhof Center GRR 058
Mayers, Leifa	Mentor	9:00 a.m.	Kirkhof Center GRR 076
Mayers, Leifa	Mentor	9:00 a.m.	Kirkhof Center GRR 121
Mayers, Leifa	Mentor	9:00 a.m.	Kirkhof Center GRR 128
Mayers, Leifa	Mentor	9:30 a.m.	Kirkhof Center 2266
Mayers, Leifa	Mentor	10:30 a.m.	Kirkhof Center 2266
Mayers, Leifa	Mentor	12:30 p.m.	Kirkhof Center 2259
Mayers, Leifa	Mentor	4:00 p.m.	Kirkhof Center 2259
McClees, Claire	Student	1:00 p.m.	Henry Hall Atrium 022
McDaniels, Heather	Student	10:00 a.m.	Kirkhof Center GRR 164
McDermott, Holly	Student	4:00 p.m.	MIP Library Exhibition Space 15
McFarland, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 031
McHugh, Caitlin	Student	10:00 a.m.	Kirkhof Center GRR 044
McMonagle, Grace	Student	3:00 p.m.	Henry Hall Atrium 027
Mechling, Jacob	Student	11:00 a.m.	Henry Hall Atrium 078
Mellerowicz, Zachary	Student	9:00 a.m.	Kirkhof Center GRR 067
Metzger, Stacey	Student	11:00 a.m.	Henry Hall Atrium 084
Meyer, Kyle	Student	10:00 a.m.	Henry Hall Atrium 081
Meyers, Lauren	Student	10:00 a.m.	Henry Hall Atrium 019
Miller, Christian	Student	2:00 p.m.	Kirkhof Center GRR 111
Miller, Grant	Student	1:00 p.m.	Kirkhof Center GRR 109

Miller, Kristen	Student	10:00 a.m.	Henry Hall Atrium 013
Miller, Laura	Student	11:00 a.m.	Henry Hall Atrium 038
Miller, Madison	Student	9:00 a.m.	Kirkhof Center GRR 072
Miller, Michael	Student	1:00 p.m.	Kirkhof Center 2259
Miller, Olivia	Student	12:00 p.m.	Kirkhof Center GRR 146
Miller, Olivia	Student	1:00 p.m.	Kirkhof Center GRR 144
Minor, Deborah	Student	9:00 a.m.	Kirkhof Center GRR 083
Mitchell, Anthea	Student	9:00 a.m.	Kirkhof Center GRR 009
Mitchell, Anthea	Student	10:00 a.m.	Kirkhof Center GRR 110
Moler, Maxwell	Student	9:00 a.m.	Henry Hall Atrium 025
Moll, Sarah	Student	10:00 a.m.	Kirkhof Center GRR 124
Moore, Jared	Mentor	9:00 a.m.	Henry Hall Atrium 053
Moore, Jennifer	Mentor	9:00 a.m.	Henry Hall Atrium 015
Moran, Nick	Student	2:00 p.m.	Kirkhof Center 2259
Morison, Melissa	Mentor	12:00 p.m.	Kirkhof Center 2266
Morison, William	Mentor	9:00 a.m.	Henry Hall Atrium 106
Mort, Jackson	Student	2:00 p.m.	Henry Hall Atrium 017
Mort, Jackson	Student	3:00 p.m.	Kirkhof Center GRR 143
Mueller, Rachel	Student	11:00 a.m.	Kirkhof Center GRR 131
Mugica-Canos, David	Student	9:00 a.m.	Henry Hall Atrium 087
Mulnix, Ethan	Student	3:00 p.m.	Henry Hall Atrium 091
Mulvey, Kaitlyn	Student	9:00 a.m.	Kirkhof Center 1142
Musolf, Cort	Student	11:00 a.m.	Kirkhof Center GRR 149

N

Napier, Shannon	Student	9:00 a.m.	Henry Hall Atrium 034
Napier, Shannon	Student	9:00 a.m.	Henry Hall Atrium 089
Nelson, Aaron	Student	11:00 a.m.	Kirkhof Center GRR 161
Nelson, Olivia	Student	10:00 a.m.	Kirkhof Center 2263
Neuhaus, TJ	Student	11:00 a.m.	Henry Hall Atrium 054
Nghiem-Olson, Vauwn	Student	11:00 a.m.	Henry Hall Atrium 059
Nguyen, Thuy-Thuong	Student	3:00 p.m.	Kirkhof Center GRR 001
Noel, Hannah	Student	3:00 p.m.	Kirkhof Center 2263
Nordman, Erik	Mentor	9:00 a.m.	Kirkhof Center GRR 114
Norris, Alexander	Student	10:00 a.m.	Kirkhof Center 2270
Norris, Margaret	Student	10:00 a.m.	Kirkhof Center 1142

O

O'Connor, Tara	Student	3:30 p.m.	Kirkhof Center 2270
Ojeda-Retamal, Joshua	Student	2:00 p.m.	Kirkhof Center GRR 053

Okarski, Jacob	Student	10:00 a.m.	Henry Hall Atrium 045
Okopski, Carianne	Student	12:00 p.m.	Kirkhof Center GRR 035
Oliphant, Christopher	Student	11:00 a.m.	Kirkhof Center GRR 117
Oneka, Morgan	Student	12:30 p.m.	Kirkhof Center 2266
Oppman, Rebecca	Student	9:00 a.m.	Kirkhof Center GRR 069
Oravitz, Olivia	Student	9:00 a.m.	Henry Hall Atrium 100
Orr, Taylor	Student	3:00 p.m.	Kirkhof Center GRR 014
Osiptsov, Philipp	Student	9:00 a.m.	Henry Hall Atrium 060
Oss, Kendrick	Student	9:00 a.m.	Kirkhof Center GRR 150
Ostrow, Bruce	Mentor	9:00 a.m.	Kirkhof Center GRR 025
Ott, Ruth	Student	9:30 a.m.	Kirkhof Center 2266
Ott, Ruth	Student	11:00 a.m.	Kirkhof Center 2266
Oyebanji, Oyekanmi Oyeniya	Student	3:00 p.m.	Henry Hall Atrium 064

P

Page, William	Student	3:00 p.m.	Henry Hall Atrium 005
Paithankar, Shreya	Student	2:00 p.m.	Henry Hall Atrium 098
Palazzolo, Linda	Student	11:00 a.m.	Kirkhof Center GRR 146
Pankratz, Trey	Student	9:00 a.m.	Kirkhof Center GRR 132
Parker, Darren	Mentor	9:00 a.m.	Henry Hall Atrium 034
Parmley, Taylor	Student	11:00 a.m.	Kirkhof Center GRR 134
Parr, Mary	Student	10:00 a.m.	Henry Hall Atrium 019
Pascoe, Meredith	Student	2:00 p.m.	Henry Hall Atrium 030
Paulson, Molly	Mentor	9:00 a.m.	Henry Hall Atrium 023
Pazdernik, Charles	Mentor	3:30 p.m.	Kirkhof Center 2259
Pearl, Christopher	Mentor	9:00 a.m.	Henry Hall Atrium 033
Pearl, Christopher	Mentor	9:00 a.m.	Henry Hall Atrium 111
Pearl, Christopher	Mentor	9:00 a.m.	Kirkhof Center GRR 021
Pearl, Christopher	Mentor	9:00 a.m.	Kirkhof Center GRR 079
Pearl, Christopher	Mentor	9:00 a.m.	Kirkhof Center GRR 093
Pearl, Christopher	Mentor	9:00 a.m.	Kirkhof Center GRR 101
Pellegrom, Colin	Student	11:00 a.m.	Kirkhof Center GRR 048
Pellegrom, Colin	Student	1:00 p.m.	Kirkhof Center GRR 112
Pentecost, Thomas	Mentor	9:00 a.m.	Kirkhof Center GRR 096
Perez, John	Student	10:00 a.m.	Henry Hall Atrium 058
Perez, John	Student	11:00 a.m.	Henry Hall Atrium 044
Perrine, Toni	Mentor	9:00 a.m.	Henry Hall Atrium 049
Peruzzi, Christopher	Student	3:00 p.m.	Henry Hall Atrium 093
Peters, Alyson	Student	2:00 p.m.	Henry Hall Atrium 085

Peterson, Bethany	Mentor	9:00 a.m.	Kirkhof Center GRR 118
Peterson, Grace	Student	10:00 a.m.	Henry Hall Atrium 006
Peterson, Rachel	Mentor	4:30 p.m.	Kirkhof Center 2270
Petriella, Dominic	Student	10:00 a.m.	Kirkhof Center GRR 052
Peyton, Dalton	Student	1:00 p.m.	Kirkhof Center GRR 103
Pham, Uyen	Student	11:00 a.m.	Kirkhof Center GRR 154
Phillips, Alexander	Student	12:00 p.m.	Henry Hall Atrium 088
Pickett, Trevor	Student	12:00 p.m.	Kirkhof Center GRR 157
Pipe, Alycia	Student	11:00 a.m.	Kirkhof Center GRR 084
Pipe, Alycia	Student	1:00 p.m.	Henry Hall Atrium 074
Plichta, Mitchell	Student	9:00 a.m.	Kirkhof Center GRR 046
Plue, Morgan	Student	11:00 a.m.	Kirkhof Center GRR 033
Poirier, Caroline	Student	12:00 p.m.	Henry Hall Atrium 032
Polen, Madison	Student	10:00 a.m.	Henry Hall Atrium 079
Pols, Amanda	Student	11:00 a.m.	Kirkhof Center GRR 145
Powers, Brenna	Student	4:00 p.m.	Kirkhof Center GRR 139
Powers, Rachel	Mentor	9:00 a.m.	Kirkhof Center GRR 154
Powers, Rachel	Mentor	9:00 a.m.	Henry Hall Atrium 051
Pozzi, Gabriela	Mentor	11:00 a.m.	Kirkhof Center 2263
Pozzi, Gabriela	Mentor	4:00 p.m.	Kirkhof Center 2263
Prego, Daniel	Student	11:00 a.m.	Kirkhof Center GRR 149
Preston, Marilyn	Mentor	10:30 a.m.	Kirkhof Center 2266
Priebs, Nicholas	Student	10:00 a.m.	Henry Hall Atrium 081
Priebs, Nicholas	Student	12:00 p.m.	Kirkhof Center GRR 157
Ptak, Karolina	Student	4:00 p.m.	MIP Library Exhibition Space 07
Ptak, Karolina	Student	4:00 p.m.	MIP Library Exhibition Space 08

Q

Quinlan, Kayla	Student	11:00 a.m.	Kirkhof Center GRR 147
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R

Ramirez, Siera	Student	9:00 a.m.	Kirkhof Center GRR 151
Ramsson, Eric	Mentor	9:00 a.m.	Henry Hall Atrium 055
Rancour, Sierra	Student	9:00 a.m.	Kirkhof Center GRR 046
Ranger, Nicholas	Student	12:00 p.m.	MIP LIB Main Floor Video Display
Rankinen, Wil	Mentor	9:00 a.m.	Kirkhof Center GRR 078
Rankinen, Wil	Mentor	9:00 a.m.	Henry Hall Atrium 054
Raymo, Ronald	Student	1:00 p.m.	Kirkhof Center GRR 011
Rayor, Diane	Mentor	9:00 a.m.	Kirkhof Center GRR 012
Reasoner, Erin	Student	11:00 a.m.	Kirkhof Center 2270

Reasoner, Erin	Student	1:00 p.m.	Kirkhof Center 2263
Rebello Lima, Vinicius	Mentor	9:00 a.m.	Kirkhof Center GRR 069
Rebello Lima, Vinicius	Mentor	10:00 a.m.	Kirkhof Center 2263
Rebello Lima, Vinicius	Mentor	4:00 p.m.	MIP Library Exhibition Space 02
Rebello Lima, Vinicius	Mentor	4:00 p.m.	MIP Library Exhibition Space 03
Rebello Lima, Vinicius	Mentor	4:00 p.m.	MIP Library Exhibition Space 07
Rebello Lima, Vinicius	Mentor	4:00 p.m.	MIP Library Exhibition Space 08
Rebello Lima, Vinicius	Mentor	4:00 p.m.	MIP Library Exhibition Space 09
Rebello Lima, Vinicius	Mentor	4:00 p.m.	MIP Library Exhibition Space 10
Rebello Lima, Vinicius	Mentor	4:00 p.m.	MIP Library Exhibition Space 13
Rebello Lima, Vinicius	Mentor	4:00 p.m.	MIP Library Exhibition Space 19
Reed, Chris	Mentor	9:00 a.m.	Kirkhof Center GRR 022
Reed, Chris	Mentor	9:00 a.m.	Kirkhof Center GRR 027
Reed, Chris	Mentor	9:00 a.m.	Kirkhof Center GRR 040
Reed, Chris	Mentor	9:00 a.m.	Kirkhof Center GRR 048
Reed, Chris	Mentor	9:00 a.m.	Kirkhof Center GRR 051
Reid, Jordan	Student	11:00 a.m.	Henry Hall Atrium 078
Reid, Madison	Student	9:00 a.m.	Kirkhof Center GRR 066
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 047
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 061
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 062
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 063
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 064
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 065
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 069
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 070
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 071
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 072
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 097
Remski, Lindsey	Student	9:00 a.m.	Kirkhof Center GRR 083
Remski, Lindsey	Student	1:00 p.m.	Kirkhof Center GRR 103
Renaud, Liah	Student	9:00 a.m.	Henry Hall Atrium 034
Renaud, Liah	Student	9:00 a.m.	Henry Hall Atrium 089
Richards, De'Chelle	Student	4:00 p.m.	Kirkhof Center GRR 128
Richiert, Dawn	Mentor	9:00 a.m.	Kirkhof Center GRR 027
Richiert, Dawn	Mentor	9:00 a.m.	Kirkhof Center GRR 048
Richiert, Dawn	Mentor	9:00 a.m.	Kirkhof Center GRR 051
Richter, Tani	Student	3:00 p.m.	Kirkhof Center GRR 085

Riebschleger, Zakary	Student	9:00 a.m.	Kirkhof Center GRR 151
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 081
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 083
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 102
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 085
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 123
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 160
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 162
Risko, Olivia	Student	9:00 a.m.	Henry Hall Atrium 079
Risko, Olivia	Student	2:00 p.m.	Henry Hall Atrium 080
Ritsema, Molly	Student	11:00 a.m.	Kirkhof Center GRR 084
Robb, Lauren	Student	9:00 a.m.	Kirkhof Center GRR 140
Robertson, Sarah	Student	3:00 p.m.	Henry Hall Atrium 003
Robinson, Cole	Student	1:00 p.m.	Kirkhof Center 2270
Robinson, Grace	Student	9:00 a.m.	Kirkhof Center GRR 123
Rodriguez, Sabrina	Student	1:00 p.m.	Henry Hall Atrium 112
Rodriguez-Villasante Fernandez, Gonzalo	Student	3:30 p.m.	Kirkhof Center 2270
Rogers, Rebecca	Student	11:00 a.m.	Kirkhof Center GRR 058
Rogers, Rebecca	Student	1:00 p.m.	Kirkhof Center GRR 059
Rojas, Hannah	Student	1:00 p.m.	Kirkhof Center GRR 092
Roldan, Michelle	Student	1:00 p.m.	Kirkhof Center GRR 090
Rosekrans, Makayla	Student	9:00 a.m.	Henry Hall Atrium 016
Rosier, Brooke	Student	3:30 p.m.	Kirkhof Center 2270
Rosol, Kira	Student	11:00 a.m.	Kirkhof Center 2263
Rosol, Kira	Student	2:30 p.m.	Kirkhof Center 2270
Ross, Sally	Mentor	9:00 a.m.	Henry Hall Atrium 046
Roudebush, Christine	Student	9:00 a.m.	Kirkhof Center 1142
Rounsifer, Ronald	Student	9:00 a.m.	Henry Hall Atrium 082
Rubambiza, Gloire	Student	3:00 p.m.	Kirkhof Center GRR 077
Rucker, Karmen	Student	12:00 p.m.	Kirkhof Center GRR 065
Rushing, Morgan	Student	3:00 p.m.	Henry Hall Atrium 091
Russa, Mary	Mentor	9:00 a.m.	Henry Hall Atrium 013
Russell, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 060
Russell, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 158
Russell, Amy	Mentor	2:00 p.m.	Kirkhof Center 2266
Ryefield, Misti	Mentor	9:00 a.m.	Henry Hall Atrium 076
S			
Sachteleben, Emma	Student	10:00 a.m.	Kirkhof Center GRR 008

Salame, Ali	Student	2:00 p.m.	Kirkhof Center GRR 053
Salas, Nora	Mentor	9:00 a.m.	Henry Hall Atrium 058
Salas, Nora	Mentor	9:00 a.m.	Henry Hall Atrium 004
Saleh, Jenna	Student	10:00 a.m.	Henry Hall Atrium 023
Sartorius, Erin	Student	9:00 a.m.	Kirkhof Center 2259
Saville, Mackenzie	Student	10:00 a.m.	Henry Hall Atrium 079
Schafer, Claire	Student	12:30 p.m.	Kirkhof Center 1142
Schaub, Gayle	Mentor	10:00 a.m.	Kirkhof Center 2263
Schepke, Kristin	Student	2:00 p.m.	Henry Hall Atrium 015
Schippers, Laura	Student	4:00 p.m.	MIP Library Exhibition Space 02
Schley, Zachary	Student	1:00 p.m.	Henry Hall Atrium 022
Schlicker, Steven	Mentor	9:00 a.m.	Henry Hall Atrium 089
Schlicker, Steven	Mentor	9:00 a.m.	Kirkhof Center GRR 105
Schout, Jenny	Student	12:30 p.m.	Kirkhof Center 1142
Schuemann, Eric	Student	1:00 p.m.	Kirkhof Center GRR 085
Schutzenhofer, Alyssa	Student	9:00 a.m.	Henry Hall Atrium 060
Schutzenhofer, Alyssa	Student	3:00 p.m.	Kirkhof Center GRR 031
Schymik, Gregory	Mentor	9:00 a.m.	Kirkhof Center GRR 061
Scollard, Morgan	Student	11:00 a.m.	Kirkhof Center GRR 131
Scripps, Jerry	Mentor	9:00 a.m.	Henry Hall Atrium 082
Sederlund, Allison	Student	9:00 a.m.	Henry Hall Atrium 031
Seley, Beverly	Mentor	4:00 p.m.	MIP Library Exhibition Space 15
Seley, Beverly	Mentor	4:00 p.m.	MIP Library Exhibition Space 18
Serrata, Medar	Mentor	3:00 p.m.	Kirkhof Center 2263
Seymour, Jenna	Student	1:00 p.m.	Kirkhof Center GRR 137
Shalayko, Eric	Student	4:00 p.m.	Henry Hall Atrium 049
Shane, David	Student	1:00 p.m.	Kirkhof Center GRR 094
Shaughnessy, Megan	Student	12:00 p.m.	Kirkhof Center GRR 148
Shavalier, Sydney	Student	12:00 p.m.	Kirkhof Center GRR 010
Shavalier, Sydney	Student	1:00 p.m.	Kirkhof Center GRR 020
Shaw, Darcie	Student	9:00 a.m.	Kirkhof Center GRR 152
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 026
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 039
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 042
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 044
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 045
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 066
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 077

Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 078
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 079
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 080
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 084
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 085
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 086
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 112
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 083
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 130
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 067
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 126
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 131
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 149
Shi, Yi	Student	3:00 p.m.	Henry Hall Atrium 071
Shier, Anna	Student	9:00 a.m.	Kirkhof Center GRR 163
Shippy, Rachel	Student	9:00 a.m.	Kirkhof Center GRR 104
Short, Lindsey	Student	10:00 a.m.	Kirkhof Center GRR 044
Sickrey, Jordan	Student	10:00 a.m.	Kirkhof Center 2259
Sikora, Alex	Student	10:00 a.m.	Henry Hall Atrium 079
Simmers, Jacqueline	Student	11:00 a.m.	Kirkhof Center GRR 084
Simon, Derek	Student	9:00 a.m.	Henry Hall Atrium 104
Simon, Katelyn	Student	3:00 p.m.	Henry Hall Atrium 036
Sincox, Brittany	Student	10:00 a.m.	Kirkhof Center GRR 026
Sincox, Brittany	Student	3:00 p.m.	Kirkhof Center 2263
Skubick, Solona	Student	11:00 a.m.	Kirkhof Center GRR 106
Slim, Yousif	Student	3:00 p.m.	Henry Hall Atrium 007
Slowik, Amanda	Student	2:00 p.m.	Henry Hall Atrium 111
Smedes, Natalie	Student	11:00 a.m.	Kirkhof Center GRR 084
Smith, Hailey	Student	11:00 a.m.	Henry Hall Atrium 042
Smith, Kendra	Student	10:00 a.m.	Kirkhof Center 2263
Smith, Kendra	Student	4:00 p.m.	MIP Library Exhibition Space 12
Smith, Stafford	Mentor	4:00 p.m.	MIP Library Exhibition Space 01
Smith, Tori	Student	9:00 a.m.	Kirkhof Center GRR 083
Snoke, Morgan	Student	11:30 a.m.	Kirkhof Center 1142
Sobeck, Jacob	Student	11:00 a.m.	Henry Hall Atrium 099
Sommers, Jacob	Student	11:00 a.m.	Henry Hall Atrium 099
Sommers, Jacob	Student	1:00 p.m.	Kirkhof Center GRR 103
Sparks, Benjamin	Student	3:00 p.m.	Henry Hall Atrium 061

Spear, Josalyn	Student	11:30 a.m.	Kirkhof Center 1142
Spielberger, Dana	Student	4:00 p.m.	Henry Hall Atrium 010
Spoelstra, Sandra	Mentor	9:00 a.m.	Kirkhof Center GRR 092
Spring, Robin	Mentor	3:30 p.m.	Kirkhof Center 2270
Spyker, Anthony	Student	1:00 p.m.	Kirkhof Center GRR 020
Stankus, Corey	Student	4:00 p.m.	Henry Hall Atrium 028
Stansbie, Jonathan	Student	11:00 a.m.	Kirkhof Center GRR 117
Stark, David	Mentor	9:00 a.m.	Kirkhof Center 2263
Staves, Mark	Mentor	11:30 a.m.	Kirkhof Center 2259
Stayman, Joshua	Student	9:00 a.m.	Kirkhof Center GRR 036
Steers, Allison	Student	9:00 a.m.	Kirkhof Center GRR 148
Steffens, Brent	Mentor	9:00 a.m.	Kirkhof Center GRR 037
Stewart, Jennifer	Mentor	9:00 a.m.	Kirkhof Center GRR 113
Stinson, Noah	Student	10:00 a.m.	Kirkhof Center GRR 126
Stoepker, Jessyca	Student	3:00 p.m.	Henry Hall Atrium 057
Stoll, Skyler	Student	4:30 p.m.	Kirkhof Center 2270
Stone, Jennifer	Student	9:00 a.m.	Kirkhof Center GRR 066
Strablow, Sydney	Student	10:00 a.m.	Henry Hall Atrium 106
Strickler, Matthew	Student	9:00 a.m.	Kirkhof Center GRR 123
Strickler, Timothy	Mentor	9:00 a.m.	Henry Hall Atrium 016
Strickler, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 027
Strickler, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 048
Strickler, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 051
Stroik, Laura	Mentor	9:00 a.m.	Henry Hall Atrium 011
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 027
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 048
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 051
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 112
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 151
Strouse, Susan	Mentor	9:00 a.m.	Kirkhof Center GRR 033
Sugg, Brittany	Student	1:00 p.m.	Kirkhof Center GRR 103
Sui, Yuan	Student	3:00 p.m.	Henry Hall Atrium 070
Sullivan, Dorie	Student	12:00 p.m.	Kirkhof Center GRR 030
Sun, Wanxiao	Mentor	9:00 a.m.	Kirkhof Center GRR 161
Sundblad, Morgan	Student	9:00 a.m.	Kirkhof Center GRR 086
Suran, Kimberly	Student	4:00 p.m.	Kirkhof Center GRR 056
Suttner, Bekah	Student	9:00 a.m.	Kirkhof Center GRR 013
Sutton, Parker	Student	10:00 a.m.	Henry Hall Atrium 081

Swets, Benjamin	Mentor	9:00 a.m.	Kirkhof Center GRR 030
Swiatek, Austin	Student	9:00 a.m.	Kirkhof Center GRR 005
Sylvester, Francis	Mentor	9:00 a.m.	Henry Hall Atrium 060
Sylvester, Francis	Mentor	9:00 a.m.	Kirkhof Center GRR 072
Sylvester, Francis	Mentor	9:00 a.m.	Kirkhof Center GRR 089
Symons, Benjamin	Student	4:00 p.m.	MIP Library Exhibition Space 14
Symons, Benjamin	Student	4:00 p.m.	MIP Library Exhibition Space 18
Szarecka, Agnieszka	Mentor	9:00 a.m.	Henry Hall Atrium 073
Szilagyi, Jakob	Student	9:00 a.m.	Henry Hall Atrium 102

T

Tafel, Heather	Mentor	10:30 a.m.	Kirkhof Center 2259
Talley, Brett	Student	9:00 a.m.	Kirkhof Center GRR 027
Tappenden, Audrey	Student	10:00 a.m.	Kirkhof Center GRR 121
Tardani, Renee	Student	10:00 a.m.	Kirkhof Center GRR 043
Taylor, Grant	Student	1:00 p.m.	Kirkhof Center 1142
Tefend, Jenna	Student	9:00 a.m.	Kirkhof Center GRR 095
Tekiela, Kelly	Student	10:00 a.m.	Henry Hall Atrium 032
TerAvest, Victoria	Student	12:30 p.m.	Kirkhof Center 1142
Thomas, Derek	Mentor	9:00 a.m.	Henry Hall Atrium 048
Thomas, Derek	Mentor	9:00 a.m.	Kirkhof Center GRR 054
Thompson, Joshua	Student	1:00 p.m.	Henry Hall Atrium 052
Thompson, Sarah	Student	9:00 a.m.	Henry Hall Atrium 055
Thrun, Victoria	Student	11:30 a.m.	Kirkhof Center 1142
Thweni, Angela	Student	10:00 a.m.	Kirkhof Center 1142
Tomsich, Lauren	Student	4:00 p.m.	MIP Library Exhibition Space 19
Trefftz, Christian	Mentor	9:00 a.m.	Henry Hall Atrium 082
Trulock, Rachel	Student	9:30 a.m.	Kirkhof Center 1142
Tsou, Pei-Lan	Mentor	9:00 a.m.	Henry Hall Atrium 095
Tusch, Guenter	Mentor	9:00 a.m.	Henry Hall Atrium 098
Tusch, Guenter	Mentor	9:00 a.m.	Kirkhof Center GRR 061

U

Uhl, Emily	Student	10:00 a.m.	Kirkhof Center GRR 096
Underhill, Matthew	Student	9:00 a.m.	Kirkhof Center GRR 159
Ureel, Faith	Student	2:00 p.m.	Kirkhof Center 2266
Uy, Dominador	Student	1:00 p.m.	Kirkhof Center GRR 006

V

Vaitkevicius, Eric	Student	3:00 p.m.	Henry Hall Atrium 091
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Valdez, Glenn	Mentor	9:00 a.m.	Henry Hall Atrium 035
Vallery, Richard	Mentor	9:00 a.m.	Henry Hall Atrium 107
Van Dam, Benjamin	Student	9:00 a.m.	Kirkhof Center 1104
Van Dusen, Alexis	Student	1:00 p.m.	Kirkhof Center GRR 103
Van Til, Monica	Student	9:00 a.m.	Henry Hall Atrium 012
VanDam, Julia	Student	2:00 p.m.	Kirkhof Center GRR 123
VanFleteren, Aaron	Student	9:00 a.m.	Henry Hall Atrium 025
VandenBerg, Brittany	Student	9:00 a.m.	Kirkhof Center GRR 140
VandenBosch, Melodee	Mentor	9:00 a.m.	Henry Hall Atrium 109
VandenBosch, Melodee	Mentor	9:00 a.m.	Kirkhof Center GRR 102
VanderKooi, Marie	Mentor	9:00 a.m.	Henry Hall Atrium 098
VanderMolen, Julia	Mentor	9:00 a.m.	Henry Hall Atrium 050
VanderPlas, Victoria	Student	11:00 a.m.	Kirkhof Center GRR 131
Vanderest, Sebastian	Student	11:00 a.m.	Henry Hall Atrium 044
Vegh, Richard	Student	3:00 p.m.	Henry Hall Atrium 097
Vieta, Sarah	Student	1:00 p.m.	Henry Hall Atrium 037
Villasana-Acosta, Carla	Student	9:00 a.m.	Kirkhof Center 2263
Viviano, Norwood	Mentor	4:00 p.m.	MIP Library Exhibition Space 14

W

Wagasky, Courtney	Student	10:00 a.m.	Kirkhof Center 2263
Wagendorp, Jeroen	Mentor	9:00 a.m.	Kirkhof Center GRR 024
Wagendorp, Jeroen	Mentor	9:00 a.m.	Henry Hall Atrium 041
Wagner, Jordan	Student	9:00 a.m.	Kirkhof Center GRR 019
Walder, Elizabeth	Student	9:00 a.m.	Henry Hall Atrium 012
Wallar, Bradley	Mentor	9:00 a.m.	Kirkhof Center GRR 074
Wampler, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 068
Wampler, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 001
Wampler, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 029
Wampler, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 032
Wampler, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 070
Wampler, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 155
Wampler, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 156
Wampler, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 157
Wang, Bing	Student	3:00 p.m.	Henry Hall Atrium 065
Wanic, Haley	Student	2:00 p.m.	Henry Hall Atrium 008
Wanye, Frank	Student	1:00 p.m.	Kirkhof Center GRR 017
Warner, Savannah	Student	10:00 a.m.	Kirkhof Center 1142
Wasielowski, Alexa	Student	10:00 a.m.	Kirkhof Center 1104

Wassermann, Maura	Student	9:00 a.m.	Henry Hall Atrium 100
Watson, Jenna	Student	1:30 p.m.	Kirkhof Center 1142
Weber, Rachael	Student	4:00 p.m.	Henry Hall Atrium 008
Webster V, Albert	Student	11:00 a.m.	Henry Hall Atrium 039
Weeden, Taylor	Student	12:00 p.m.	Kirkhof Center GRR 162
Weeden, Taylor	Student	2:00 p.m.	Kirkhof Center GRR 156
Wehrle, Katelyn	Student	4:00 p.m.	Kirkhof Center 2263
Weiland, Macie	Student	4:00 p.m.	Kirkhof Center GRR 119
West, Madelyn	Student	11:00 a.m.	Kirkhof Center GRR 107
Wheeler, Tyler	Student	11:00 a.m.	Henry Hall Atrium 107
White, Katherine	Student	4:00 p.m.	Kirkhof Center GRR 129
White, William	Student	11:00 a.m.	Kirkhof Center GRR 146
Wichman, Maia	Student	9:00 a.m.	Kirkhof Center GRR 163
Wietecha, Zachary	Student	11:00 a.m.	Kirkhof Center GRR 041
Williams, Alexandra	Student	11:00 a.m.	Henry Hall Atrium 002
Williams, Asia	Student	9:00 a.m.	Kirkhof Center GRR 072
Williams, Sabrina	Student	9:30 a.m.	Kirkhof Center 2270
Wilson, Alexis	Student	1:00 p.m.	Kirkhof Center GRR 011
Wilson, Jordyn	Student	11:00 a.m.	Kirkhof Center GRR 045
Wilson, Kaylee	Student	10:00 a.m.	Henry Hall Atrium 101
Winchester, Randy	Mentor	9:00 a.m.	Henry Hall Atrium 002
Winchester, Randy	Mentor	9:00 a.m.	Kirkhof Center GRR 107
Winchester, Randy	Mentor	9:00 a.m.	Kirkhof Center GRR 137
Witucki, Laurie	Mentor	9:00 a.m.	Henry Hall Atrium 087
Witucki, Laurie	Mentor	2:30 p.m.	Kirkhof Center 2259
Woellecke, Alena	Student	4:30 p.m.	Kirkhof Center 2266
Wolffe, Gregory	Mentor	9:00 a.m.	Kirkhof Center GRR 017
Wolffe, Gregory	Mentor	12:30 p.m.	Kirkhof Center 2266
Woller-Skar, M	Mentor	9:00 a.m.	Kirkhof Center GRR 098
Wood, Maureen	Student	9:00 a.m.	Henry Hall Atrium 012
Woods, Jacqueline	Student	11:00 a.m.	Kirkhof Center GRR 131
Wright, Holly	Student	3:00 p.m.	Kirkhof Center 2263
Wright, Mallory	Student	11:00 a.m.	Kirkhof Center 2263
Wroblewski, Michael	Mentor	10:00 a.m.	Kirkhof Center 2270
Wyffels, Brenna	Student	4:00 p.m.	Kirkhof Center 2259
X			
Xu, Yihua	Student	3:00 p.m.	Henry Hall Atrium 063

y

Yaffa, Brooke	Student	12:00 p.m.	Kirkhof Center GRR 162
Yang, Danqing	Student	3:00 p.m.	Henry Hall Atrium 072
Yats, Katherine	Student	9:00 a.m.	Kirkhof Center GRR 163
Yee, Kimbo	Mentor	9:00 a.m.	Henry Hall Atrium 104
Yee, Kimbo	Mentor	9:00 a.m.	Kirkhof Center GRR 104
Yee, Kimbo	Mentor	9:00 a.m.	Kirkhof Center GRR 115
Yee, Kimbo	Mentor	9:00 a.m.	Kirkhof Center GRR 146
York, Kelsey	Student	3:00 p.m.	Kirkhof Center GRR 097
Youker, Brandon	Mentor	9:00 a.m.	Kirkhof Center GRR 023
Younggren, Carli	Student	10:00 a.m.	Kirkhof Center GRR 037

z

Zack, Suzanne	Mentor	10:00 a.m.	MIP LIB Main Floor Video Display
Zellar, Victoria	Student	9:00 a.m.	Kirkhof Center GRR 009
Zettle-Sterling, Renee	Mentor	4:00 p.m.	MIP Library Exhibition Space 16
Zivi, Karen	Mentor	9:00 a.m.	Kirkhof Center GRR 059
Zivi, Karen	Mentor	2:00 p.m.	Kirkhof Center 2270
Zolynsky, Nicole	Student	9:00 a.m.	Kirkhof Center GRR 069
Zuiderveen, Rachael	Student	10:00 a.m.	Kirkhof Center GRR 076
Zwarych, Kyle	Student	9:00 a.m.	Henry Hall Atrium 100

Online Schedule Builder

Updated Presentation Information in lieu of Printed Addendum

This book is printed with information current as of mid-February. Changes often occur after the print date, and are reflected online on the Schedule Builder.

To access the Schedule Builder:

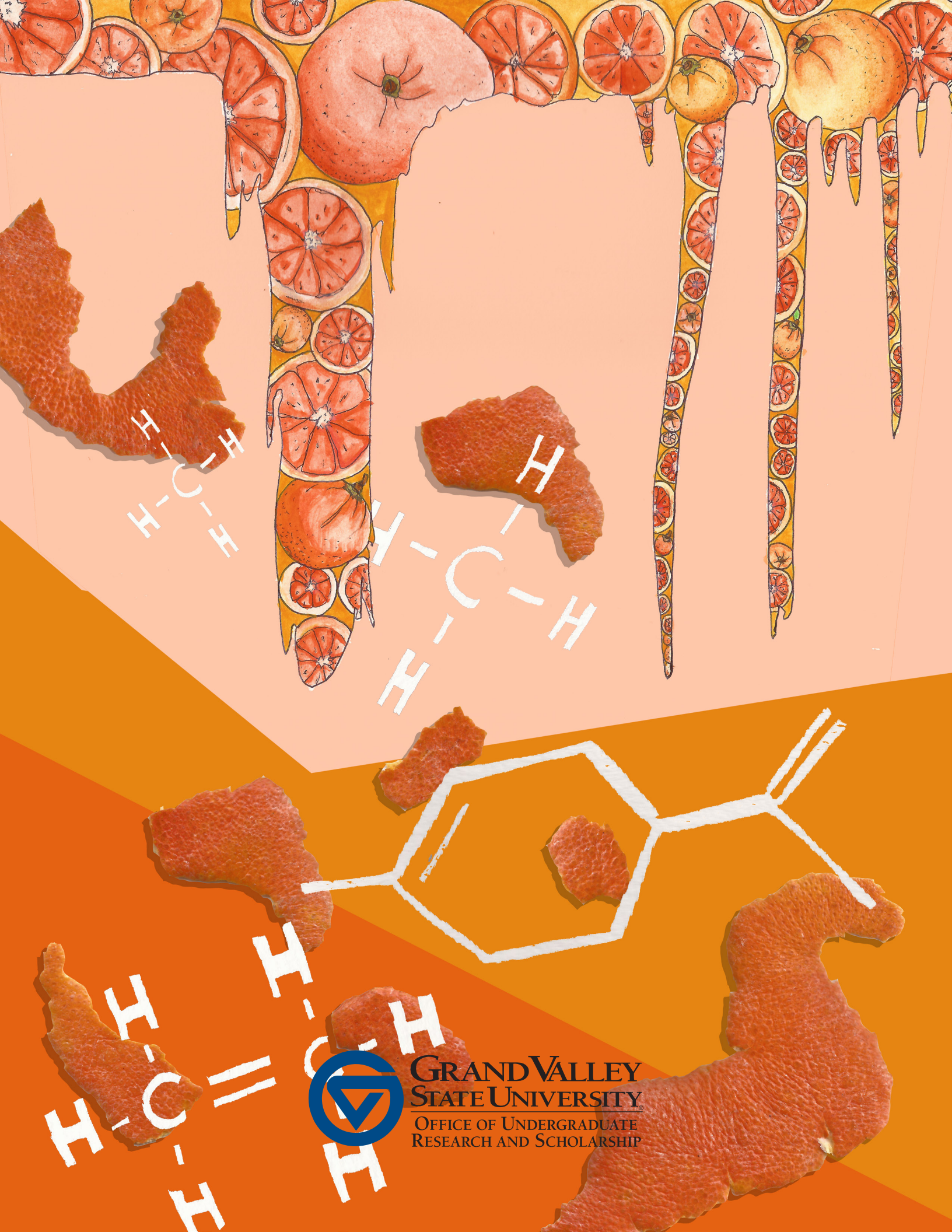
1. Go to gvsu.edu/ours/ssd
2. Click on the “Schedule Builder” link
3. Login and follow instructions

We are here to help. Please let any SSD committee member or SSD volunteer know if you have any questions. You may also contact the Office of Undergraduate Research and Scholarship at ours@gvsu.edu and/or 616-331-8100.

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