

APRIL 10, 2019

STUDENT SCHOLARS DAY



BECKY OPPMAN

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SSD Committee

Feryal Alayont	Mathematics
Alice Chapman	History
Elizabeth Flandreau	Psychology
Lauren Keough	Mathematics
Andrew Lantz	Chemistry
Vinicius Lima	Visual and Media Arts
Leifa Mayers	Women, Gender, and Sexuality Studies
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
Dwayne Tunstall	Philosophy
Richard Vallery	Physics
Todd Williams	Psychology

Welcome to Student Scholars Day 2019!

It is with great pleasure that we welcome you to celebrate the diversity and excellence of faculty-student collaboration at GVSU. In its 23rd 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, Dana Arnold, Natalia Blanco, Lavar Green-Jackson, Kristin Schepke, and LaMaiya Wright who made this process manageable and enjoyable. We thank the members of the 2019 SSD committee, Feryal Alayont, Alice Chapman, Elizabeth Flandreau, Lauren Keough, Andrew Lantz, Vinicius Lima, Leifa Mayers, Melissa Morison, Debbie Morrow, Ross Reynolds, Michael Scantlebury, Dwayne Tunstall, Richard Vallery, and Todd Williams, 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 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 Becky Oppman 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. Becky'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.

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.

Panel Presentations

Kirkhof Center and Mary Idema Pew Library

9:00 a.m. – 5:00 p.m.

See page 126 for detailed schedule.

Exhibition of Art (Mar 27-Apr 11)

Mary Idema Pew Library Exhibition Space

April 10, 2019

Artist Reception 4:00 p.m.

See page 139 for detailed schedule.

Oral Presentations

Kirkhof Center

9:00 a.m. – 5:00 p.m.

See page 99 for detailed schedule.

Sessions

Kirkhof Center and Mary Idema Pew Library

9:00 a.m. – 5:00 p.m.

See page 135 for detailed schedule.

Film and Video

Mary Idema Pew Library Exhibition Space

9:00 a.m., 10:00 a.m, 11:00 a.m., & 1:00 p.m.

See page 144 for detailed schedule.

Statement from the Cover Artist

Becky Oppman

My artwork for the 2019 Student Scholars Day book cover is an abstract representation of the synthesis of many different academic fields forming the world of scholarship. Science, mathematics, history, art, psychology, and all other academic fields are related through the practice of research, which I see as the essence of Student Scholars Day. Visually, the artistic method of digital collage is used to represent the interaction between all of these fields.



Student Scholars Day Lunch

Kirkhof Center 2204 (Pere Marquette), Allendale Campus

12:00 p.m. (Invitation Only)

Preparing and Celebrating Graduate School Bound Students

The Office of Undergraduate Research and Scholarship and The Graduate School is hosting a lunch for GVSU students, and their faculty mentors, who are preparing for graduate school programs. We will celebrate your work and provide some tips as you prepare.

Panelists:

Isaac Clark: Medical Librarian at Western Michigan University's Homer Stryker M.D. School of Medicine.

Jennifer Landino: Her current research is supported by a postdoctoral fellowship from the American Cancer Society.

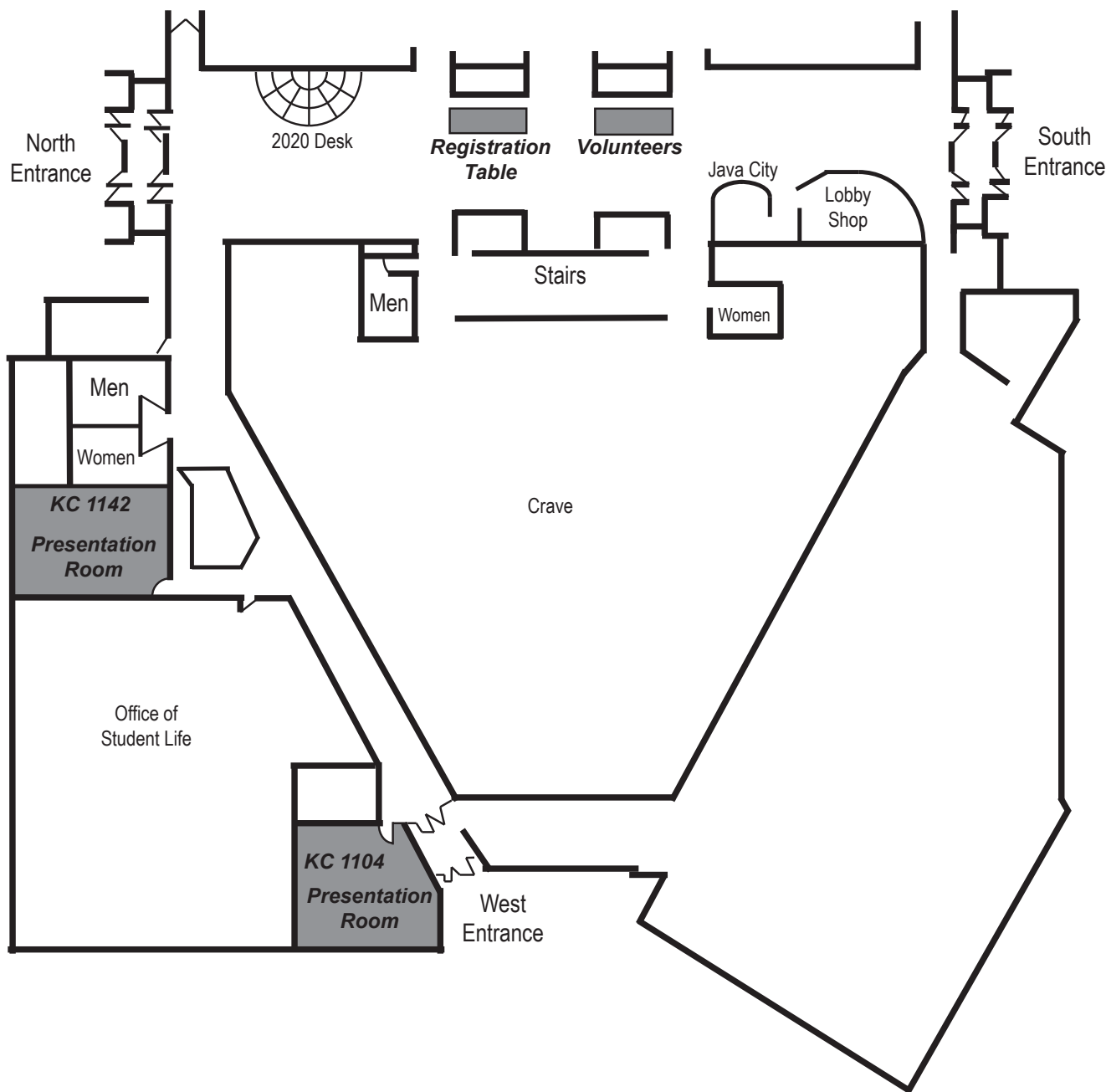
Zach Madaj: has worked in the Van Andel Research Institute's Bioinformatics and Biostatistics Core as a biostatistician for the past 4 years.

Erika VanDyke: Erika works with the Grand Rapids Foundation's restricted funds, and takes a leadership role with the activities of the Youth Grant Committee.

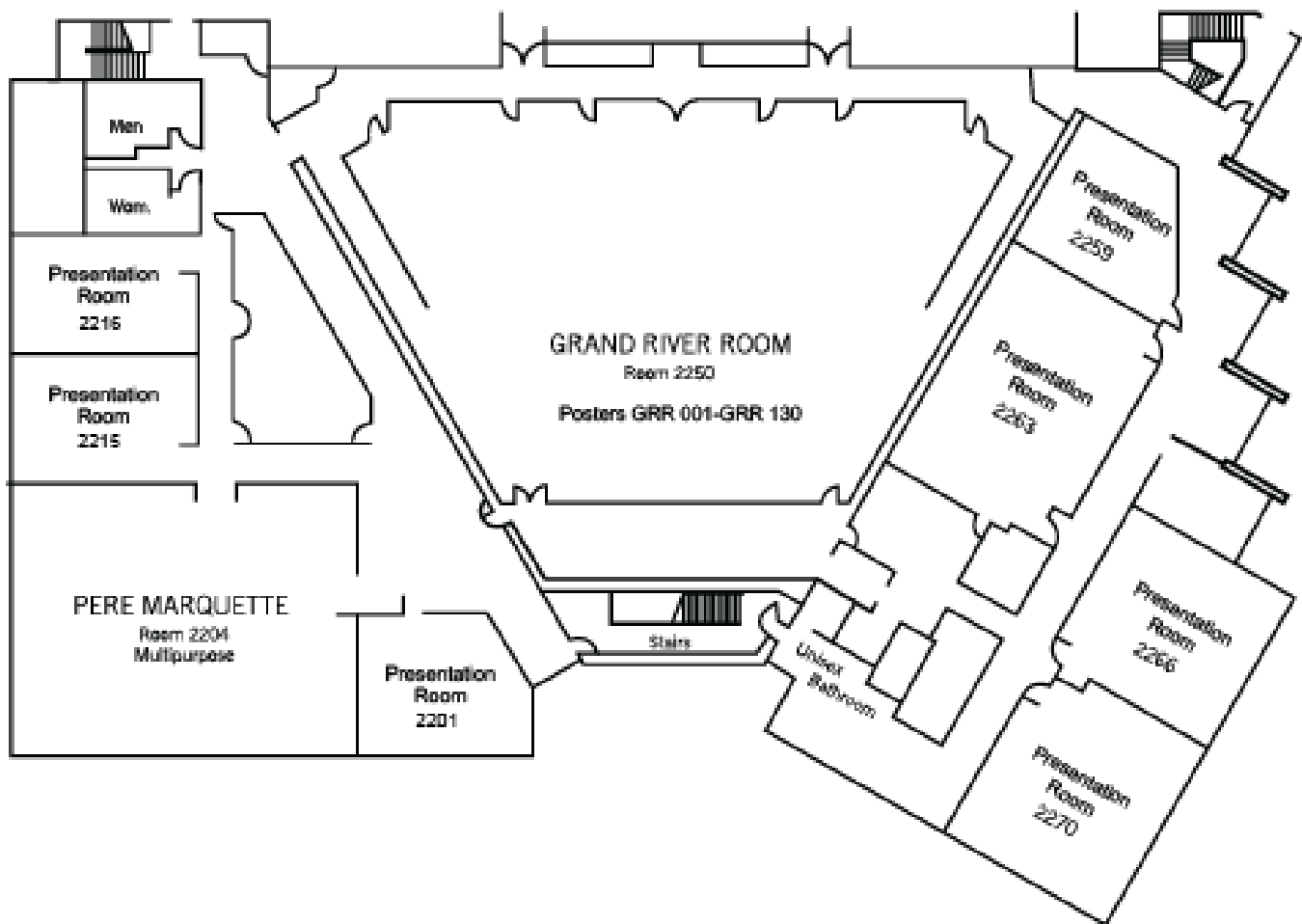
Moderator:

Dean Jeff Potteiger, The Graduate School

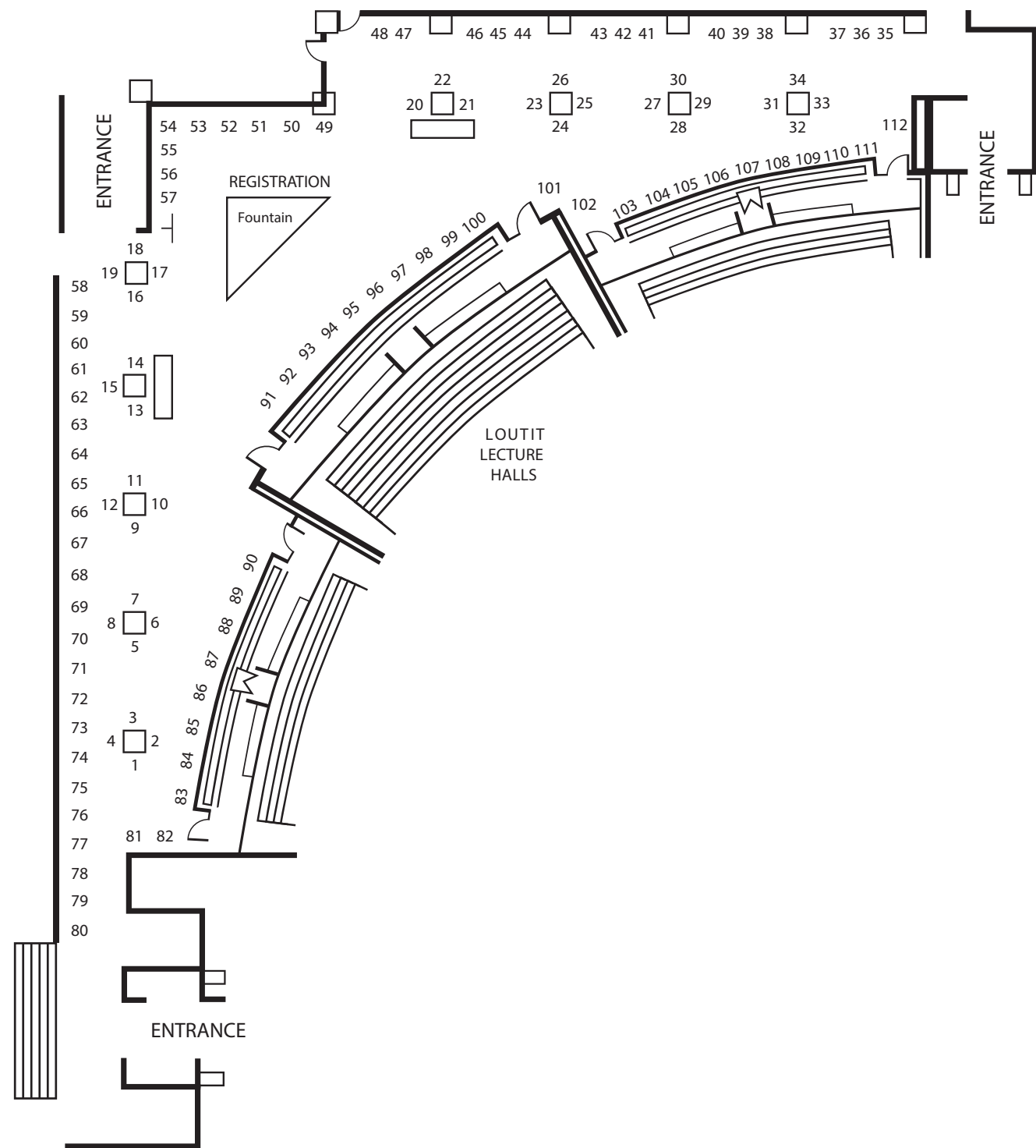
Kirkhof Center First Floor Map



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 2018 saw GVSU's second 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 2018 Beckman Scholars, both of whom are presenting at this year's SSD, are Erin Fish and Gage Paul. *More information about the program can be found at www.gvsu.edu/ours/sfp*

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 2018 McNair Scholars, many of whom are presenting at this year's SSD, include:

Brandy Curtis, Alexander Denison, Caitlan DeVries, Lavar Green-Jackson, Haley Hulan, Halily Jones, Christian Miller, Mitchell Mockerman, Kristin Schepke, and Amarri Smallwood.

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

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 2018 Student Summer Scholars presenting at this year's SSD include:

David Bronicki, Roberto Carriedo Ostos, Nicholas Dewey, Hannah Fisher, Sabrina Jenkins, Jordan Juzwiak, Brendan Kosnik, Alyssa Langenberg, Eleanore Larson, Tyrese Lillard, Michael McCabe, Maxwell Okros, Anna Prince, Cecelia Roehm, Katrina Teunis, Isabel Thompson, Nicholas Urban, Eric Vaitkevicius, and Jessica Wyn.

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



Highlights of Student Work

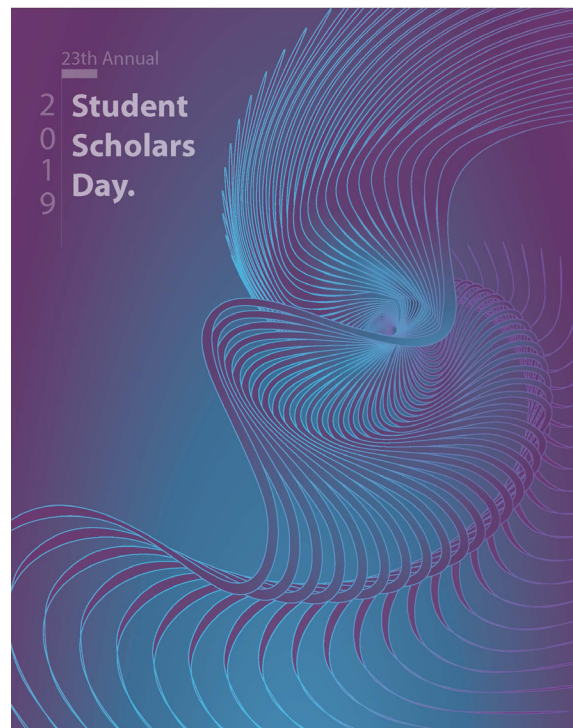
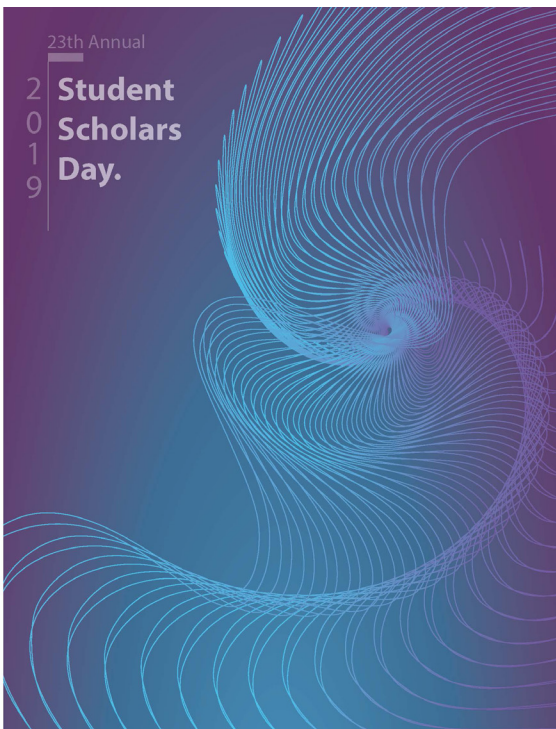
Student Scholars Day Abstract Book Cover

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.

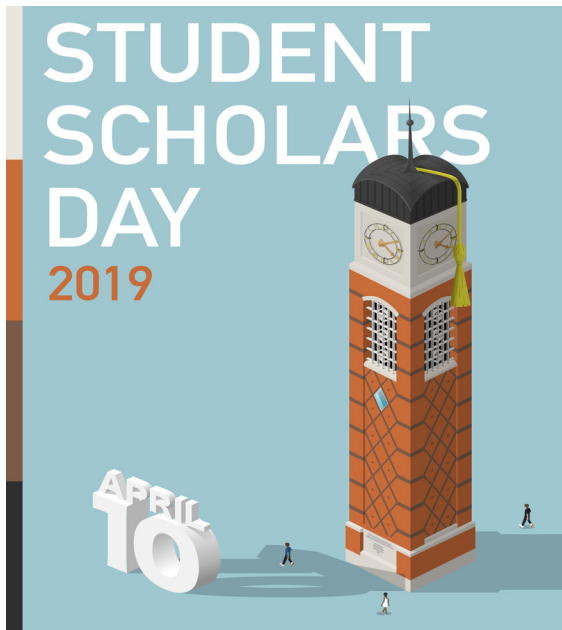
Samaa Alaa

Cover Design 1 and Cover Design 2



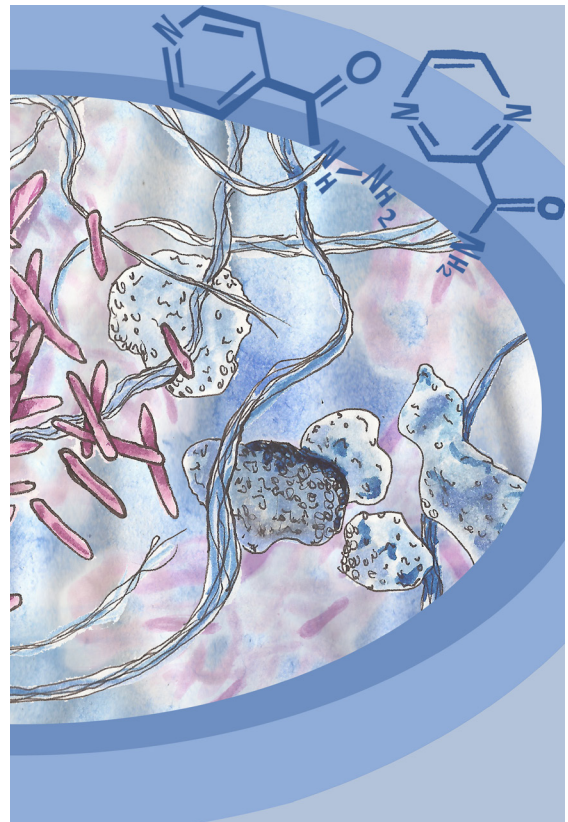
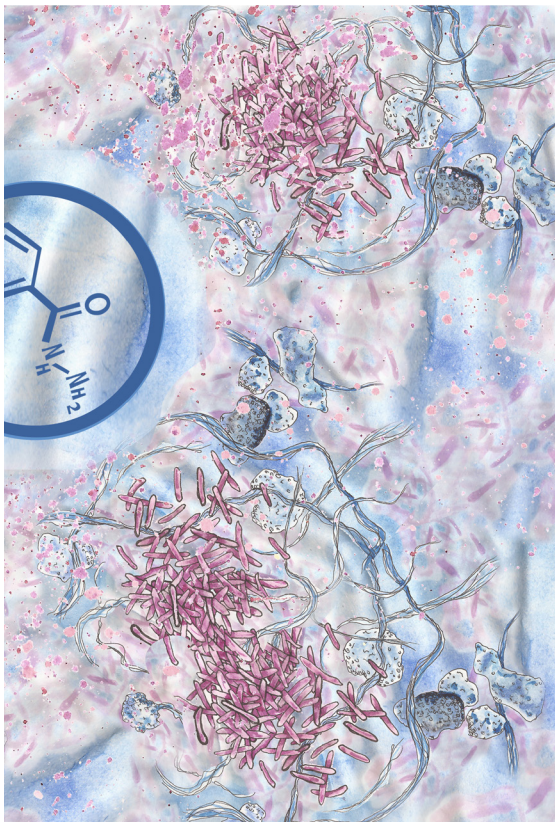
Nate Benson

Minimalist Isometric Grand Valley (Cook Carillon) Clock Tower



Anthea Mitchell

Illustration of an acid fast stain of a mycobacterium like Tuberculosis



fishladder

GVSU's student journal of art & writing
Spring 2019



Join us in celebration of the art and writing created by our campus community.

Embed by Castina Bombardo

Issue 17 Unveiling
Friday, April 19
6-8 p.m.
Lake Ontario Hall 164

Free copies of the journal will be available.

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 over 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:

Scholar & Fellowship Programs

Alayont Undergraduate Research Fellowship in Mathematics
Beckman Scholars Program at Grand Valley State University (BSP at GVSU)
GVSU Library Scholars Summer Program
GVSU McNair Scholars Program
P. Douglas Kindschi Undergraduate Research Fellowship in the Sciences
Student Summer Scholars (S3)/Modified Student Summer Scholars (MS3)

Research Support & Recognition

Academic Conference Fund (ACF)
Academic and Professional Enrichment Fund (APEF)
OURS Project Supplies Grant
Supplementary Research Support for Faculty
GVSU Undergraduate Research/Creative Scholar Transcript Designation
Undergraduate Research Assistants Program (URA)

Outreach Programs & Events

Goldwater Scholarship Program
Michigan Space Grant Consortium (MSGC)
OURS Ambassadors
Summer Research Orientation
Undergraduate Research Fair

Poster Presentations, Abstracts & Schedule

HENRY HALL ATRIUM 001

I'm Supposed to be Where? Digital and Paper Scheduling Across Adult Age Groups

Participants attending 4:00 PM - 5:00 PM

Presenter: Kelly Schwan

Mentor: Laura Lenkey

Scheduling activities of daily living is a task utilized by adults across the lifespan. This preliminary study investigates the use of paper and digital scheduling across adult age groups. Both paper and digital scheduling screener tasks were administered to 40 adults, divided into 3 groups: 30-49, 50-69, and 70-99 years of age. Initial findings suggest a difference across age groups for accuracy and efficiency of scheduling activities of daily living. Differences may be due to, exposure and use of technology, paper vs. digital scheduling preferences, and prior experiences with scheduling in general. These findings invite further investigation and should be considered when developing organizational treatment activities for persons experiencing difficulty with scheduling activities of daily living.

HENRY HALL ATRIUM 002

Effects of Dynamic Vs. Traditional Warm-up on Vertical Jump Performance

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

Presenters: Kyle Klok, Alisha Scholten, Skylar Swifink, Sydney Van Neuren

Mentor: Kyle Barnes

Previous research has shown little to no significant difference on vertical jump performance with differing warm ups. A contradicting study found dynamic warm up had the greatest impact on jump performance. The purpose of this study was to determine the difference in vertical jump performance with a novel dynamic warm up compared to a traditional warm up. 12 healthy, college students performed a vertical jump following each form of warm up; dynamic and traditional. The traditional warm up included three running laps and stretches which consisted of hamstring, quadriceps, calf, and glutes stretches. The dynamic warm up included movements where stretching and plyometrics were combined. Post warm-up each participant was equipped with the Beast Accelerometer and performed 3 vertical jump tests on the Vertec and an average was taken. Data is currently ongoing and results will be presented at Student Scholar Day.

HENRY HALL ATRIUM 003

Club Athletics and Academic Success

Participants attending 12:00 PM - 1:00 PM

Presenter: Haydn VanDenBerg

Mentor: Jon Coles

The goal of this research is to examine the relationship between gender specific club athletics and academic success, focusing specifically on what factors are the greatest predictors of good scholarship and also how scholarship of club athletes can be improved at Grand Valley.

HENRY HALL ATRIUM 004

Exploration of the Rho-associated Kinase Gene in Neurological Regeneration of

Planarian

Participants attending 12:00 PM - 1:00 PM

Presenters: Jack Ruhala, Janice Swanson

Mentor: Dawn Hart

Rho-associated kinase (ROCK) is a cytoskeletal regulator known to play a role in different neurological diseases. However, no previous studies have specifically looked at ROCK in regeneration. The focus of this study is the function of ROCK in neuro-regeneration in *Schmidtea mediterranean* planarian. Based on the known role of ROCK in brain development, we hypothesize that ROCK functions in regeneration. This experiment uses RNA interference of the ROCK gene to observe if there is any relationship between ROCK and regeneration after the amputation of the planarians head. The data collected from this experiment were analyzed using the Student's T- test. Although the data show that ROCK is unrelated to general regeneration growth, exploring other pathways in combination with ROCK may reveal an unidentified role in differentiation of cells in the central nervous system.

HENRY HALL ATRIUM 005

Protecting the Traditional Medicinal Knowledge of the Kenyan Maasai

Participants attending 9:00 AM - 10:00 AM

Presenter: Capriana Calvachi

Mentor: Kristin Hedges

Indigenous communities have used local plant life as a primary healthcare source for centuries, although these practices have been continually fading. The Olosho Ethnobotany Project, headed by Kristin Hedges, Ph.D., has been striving to document this important cultural resource among the Maasai in Kenya. It is important to establish measures of protection over this traditional knowledge, as this stage's literature review has focused on. This working paper summarizes the issues around protection, legal ramifications of bioprospecting, and recommended steps local communities can take when protecting their cultural resources and heritage. The Maasai should consider forming an inter-community representative board in the case that they are approached by bioprospectors, in order to fairly negotiate a deal that benefits all knowledge users. It is also recommended that they record their knowledge in a public database in order to establish proof of prior art in the case of a patent battle.

HENRY HALL ATRIUM 006

Archaeological Isotopic Investigations of Animal Resources at Early Urban Centers in the Southern Levant

Participants attending 1:00 PM - 2:00 PM

Presenter: Cecelia Roehm

Mentor: Elizabeth Arnold

This study examines archaeological teeth from domestic sheep, goats and donkeys using stable isotope analyses (carbon, oxygen and strontium) to provide information about the use and management of animal resources at several urban sites in Early Bronze Age (c. 2900-2500 BCE) Israel. The central research question is how do occupants of urban centers gain and use animals? The donkeys are expected to show high mobility with high diversity in strontium isotope values recorded in their teeth. Other domestic species are expected to have lower diversity in their signatures and show isotope values that indicate a local herding pattern. Stable isotope analysis tests these hypotheses by examining the life history of the recovered animals with a reconstruction of diet, mobility, and management practices obtained through sequential sampling along the teeth.

HENRY HALL ATRIUM 007

The Effects of the *Spartin-like* Gene on Regeneration in *S. mediterranea*

Participants attending 12:00 PM - 1:00 PM

Presenter: Tess Scheidel

Mentor: Matthew Christians

Planaria have long been the subject of studies done on regeneration and the process of differentiation of stem cells. However, there has not been any research done on the effects of the *Spartin-like* gene on regeneration in planaria. This gene is involved in the process of protein ubiquitination and the survival of neurons. Through the process of RNAi we knocked down the *Spartin-like* gene in attempts to understand its role in regeneration. We then amputated to study the differences in head regeneration. We found that regeneration is not visibly affected by the loss of the *Spartin-like* gene in planaria; however, behavioral phenotypes that were observed may serve as a link to the possible loss of neuron regeneration. Although the *Spartin-like* gene may not be a contributing factor in regeneration, the possible link we found between the *Spartin-like* gene and neuron regeneration in planaria may lead to further opportunities in this field of research.

HENRY HALL ATRIUM 008

Validation of Holy Basil-Induced Dilation in Coronary Arteries

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

Presenters: Navjot Azad, Joleen Cejmer, Spencer Wilkerson

Mentor: Francis Sylvester

The goal of this study was to observe the potential vasodilation of holy basil, a health supplement also known as Tulsi, using an *in vitro* animal model. Holy basil is a plant that is native to Asia and is putatively known for having a range of health benefits. To study the beneficial cardiovascular properties of holy basil, we devised an experiment in which we precontracted porcine arteries prior to testing the dilation in response to holy basil. Coronary arteries were dissected from hearts provided by a local abattoir, cut into 2mm segments, and then mounted on force transducers placed in isolated organ baths. The segments were equilibrated for 1 hour in Krebs-Henseleit buffer bubbled with 95% O₂ and 5% CO₂. All arteries were then precontracted with potassium chloride for fifteen minutes followed by the cumulative addition of increasing concentrations of holy basil. Completion of these experiments will give us insight into the potential benefits of holy basil.

HENRY HALL ATRIUM 009

Interactions Between Stress and Diet on Endocrine and Gene-expression Outcomes in Mice

Participants attending 10:00 AM - 11:00 AM

Presenters: Morgan Block, Taylor Desjarlais

Mentor: Elizabeth Flandreau

Environmental stress is known to increase risk for mental illness, however, it may also increase the risk for metabolic syndrome characterized by obesity and type 2 diabetes. Conversely, an unhealthy diet is known to increase risk for metabolic syndrome but may also be a risk factor for mental illness. In this study we find that 10 days of social defeat stress plus unhealthy diet high in fat or sucrose led to changes in endocrine systems and brain gene expression 30 days after the exposure. These data support the hypothesis that even short term administration of a high sucrose diet can lead to long-term changes in endocrine systems and brain circuitry relevant to stress and

metabolism.

HENRY HALL ATRIUM 010

The Physiological Effects of C4 on Aerobic Training

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

Presenters: Lauren Monahan, Riya Patel, Alexandria Reeves, Marisa Royer

Mentor: Kyle Barnes

Previous research has shown evidence on pre-workout supplements effects on muscle endurance and strength but, there is limited research and data on pre-workout supplements and the physiological effects of aerobic testing. This study is designed to measure the physiological effects of C4 while participating in the Bruce Protocol and to compare the effects of C4 by measuring heart rate, blood pressure and RPE to the control group. 10 college aged students were randomly allocated to either control (no C4) or experimental group which consumed 9 g C4/kg body mass. Subjects then performed the Bruce Protocol on a treadmill. Heart rate and RPE were monitored throughout the test and blood pressure was measured pre and post. Data collection is currently undergoing and results will be presented at Student Scholars Day.

HENRY HALL ATRIUM 011

Effects of Acute Moderate Exercise and Sedentary Behavior on Cognitive Performance

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

Presenters: Katelyn Erickson, Heidi Mucha, Sara Nelson

Mentor: Kyle Barnes

Previous research has shown that exercise increases overall blood flow to the brain and improves cognitive performance. The purpose of this study was to examine the effects of running on the various components of cognition such as flexibility, perception, and selective attention through the use of a Stroop test. The Stroop test assesses cognition by an individual naming the ink color of the word printed rather than reading the word itself. To increase external validity, we assessed cognition after sedentary behavior and after a bout of acute moderate exercise. In a randomized crossover design, participants either ran on a treadmill at an RPE of ~11 out of 20 or watched Netflix while seated for 15 minutes. Each session was separated by at least 48 hours. Immediately before and after the intervention, the participants completed the Stroop test to measure the accuracy and speed of cognitive performance. Data collection is currently ongoing, and the results will be presented at SSD.

HENRY HALL ATRIUM 012

Effects of Active and Passive Recovery on Blood Lactate Clearance

Participants attending 1:00 PM - 2:00 PM

Presenters: Danielle Beissel, Victoria Malak

Mentor: Kyle Barnes

Previous research has shown passive recovery results in a gradual decrease in lactate over a period of time after exercise, whereas active recovery results in abrupt decrease. The purpose of this study was to compare differences between active and passive recovery after a maximal anaerobic cycle test on blood lactate clearance rates. The experiment was conducted in a randomized repeated measures design. Ten healthy, college-aged students performed a Wingate bike test against 7.5% of their body weight. Two minutes following the test the first blood lactate sample was measured and then the subject participated in active or passive recovery for 8 min. Lactate

samples were measured again at 6 and 10 min following the completion of the Wingate test. Capillary blood lactate samples were taken from the fingertip and assessed using a portable lactate analyzer. Testing sessions were separated by at least 48 hours. Data collection is currently ongoing and results will be presented on SSD.

HENRY HALL ATRIUM 013

The Effect of Post Workout Heat Immersion on Recovery

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

Presenters: Zachary Dowd, Jonathon Grube, Alicia Mihelic, Andrew Williams

Mentor: Kyle Barnes

Previous studies have shown that cold temperatures have a positive effect on exercise recovery; however, there is a paucity of data on how heat affects recovery immediately after exercise. The purpose of this study is to assess the effects of post-workout heat immersion on exercise-induced muscle soreness. Soreness was assessed on the biceps brachii muscle prior to the beginning of the exercise test, immediately post-test, 15 minutes post-test, and 48 hours post-test using a pressure algometer. Both groups performed five sets of bicep curls to fatigue with each set decreasing in weight by a standardized amount. The experimental group was submerged in a warm water tank (102°F) for 15 minutes and the control group had no intervention. Data is currently being collected but data and results will be presented at SSD.

HENRY HALL ATRIUM 014

Investigation of Regeneration after *Cullin-3* Knock-Down via RNAi Treatment on *S. mediterranea*

Participants attending 10:00 AM - 11:00 AM

Presenter: Kevin Frost

Mentor: Matthew Christians

In this study, we are conducting research on *S. mediterranea* to see if the inhibition of *Cullin-3* will affect regeneration. Since regeneration is complex, we are uncertain with what genes are involved in the regeneration process. We primarily focus on the relationship between *Cullin-3* and head regeneration, which has never been investigated before. We proceeded to complete this experiment by looking at the regeneration of *S. mediterranea* after the amputation and *Cullin-3* knockdown. We found that knocking down *Cullin-3* correlated with a higher rate of regeneration in comparison to the negative control (ccdB). Further study is needed to suggest whether *Cullin-3* may negatively regulate growth in planarians.

HENRY HALL ATRIUM 015

Study the Cardio-Protective Effects of ERK1/2 Using Genetically Modified Mice

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

Presenter: Nicholas Urban

Mentor: Ruijie Liu

Heart disease remains the most prominent health issue in the United States. Previous studies have demonstrated the cardio-protective benefit of an increase in extracellular signal-regulated kinase 1 and 2 (ERK1/2) activity by genetically knocking out either of the known dual-specificity phosphatases (DUSP6 or DUSP8) responsible for regulating ERK1/2 phosphorylation in mice. In this study, genetically modified mice with knockouts of both the DUSP6 and DUSP8 genes (DKO) were used to study the beneficial effects of ERK1/2. Western blot analysis

showed an increase in ERK1/2 phosphorylation compared to wild type mice (WT). DKO mice also demonstrated significantly increased organ/bodyweight ratios compared to WT mice, and histological analysis showed a significant increase in cell area of DKO mice. In conclusion, our mouse model demonstrates that an increase in ERK1/2 phosphorylation may potentially prevent disease from various organs, such as the heart and liver.

HENRY HALL ATRIUM 016

Embryological and Clinical Analysis of Bilateral Supernumerary Rectus Capitis Posterior Major Through Cadaveric Dissection of 86 Year Old Female

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

Presenter: Maxwell Okros

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

The rectus capitis posterior major muscle is one of the three muscles that make up the suboccipital triangle and assist in extension and lateral rotation of the head. These muscles are typically present as a bilateral pair, with one muscle body per left and right side. In this study, we examine a bilateral anomaly of supernumerary rectus capitis posterior major muscles through cadaveric dissection of an 86 year old female. We will also discuss the association of rectus capitis posterior muscle anomalies with clinical conditions such as cervicogenic headaches as well as possible embryologic mechanisms that may contribute to such an anomaly (Tagil et al. 2005).

HENRY HALL ATRIUM 017

Dance Training Effects on Hamstring Flexibility and Ankle Mobility in Basketball Players

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

Presenter: Megan Alwardt

Mentor: Amanda Cunningham

College-aged female basketball players have prevalent lower body injuries. This could be due to their improper biomechanics while playing which could further be caused by the lack of flexibility. If their training had a greater emphasis on flexibility, their injury rate could decrease. Dance trainings allude to greater flexibility. If dance training is found to enhance flexibility, it could help basketball players have more proprioception and not get injured. Groups will be split into a dance training group and a control group. It is hypothesized that dance training will be associated with an increase in hamstring flexibility and ankle mobility in basketball players. Data will be presented at SSD.

HENRY HALL ATRIUM 018

City of Holland

Participants attending 9:00 AM - 10:00 AM

Presenters: Rachel St John, Sandra Vercellino

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Holland, Michigan, obtained from the American Community Survey.

HENRY HALL ATRIUM 019

Community Profile, Jenison, MI

Participants attending 4:00 PM - 5:00 PM

Presenter: Evan Rushton

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Jenison, Michigan, obtained from the American Community Survey.

HENRY HALL ATRIUM 020

A Comparison of the Metabolic Cost of Running in Sub 2-hour Marathon Running Shoes in Elite and Recreation Runner

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

Presenter: Jordan Juzwiak

Mentor: Kyle Barnes

A sub 2-hr marathon requires a velocity that is 2.5% faster than the world record at the time of this study (2:02:57). Both Nike and Adidas have developed shoes to help runners break the 2-hr barrier. *Purpose:* To determine if these shoes reduce VO_2 compared with established racing shoes. *Methods* 28 elite and 14 recreational runners ran 5x 5-min trials at fixed running speeds in Nike Vaporfly (NVF), Adidas Sub2 (SUB2), and Adidas adios 3 (ADI) shoes in a randomized counterbalanced design. Subjects' VO_2 and stride characteristics were measured throughout each trial. *Results:* The NVF shoe improved running economy by $2.8 \pm 1.5\%$ compared to ADI and $2.4 \pm 1.5\%$ compared to SUB2 in elite runners and $2.9 \pm 2.6\%$ compared to ADI and $2.2 \pm 2.1\%$ compared to SUB2 in recreational runners. Correlations between changes in VO_2 and stride characteristics were trivial-small. *Conclusion:* Wearing the NVF shoes during submaximal running resulted in significant reduction in VO_2 compared to ADI and SUB2.

HENRY HALL ATRIUM 021

Online Freak Show: Rethinking the Registry

Participants attending 9:00 AM - 10:00 AM

Presenter: Shelby Kiser

Mentor: Brandon Youker

The sex offender registry as it exists today is a specter of its original intentions. Once intended to keep people safe, it now serves instead as a scarlet letter for a vulnerable population in our society. The goal for this presentation is to explore the removal of the sex offender registry from public view. The visibility of the online sex offender registry is rarely used to keep a community safe, but rather to discriminate against those listed. Instead of creating a resource for the community, it is an online "freak show" that only promotes further exclusion for a community that might otherwise be rehabilitated into society. If there is no registry for violent crimes such as murder and domestic abuse, why do sex offenders receive a social life sentence? This presentation discusses the effects of the sex offender registry on community safety, the mental health of the offenders, and the impact on recidivism.

HENRY HALL ATRIUM 022

Alzheimer's Disease: A Promising Future

Participants attending 9:00 AM - 10:00 AM

Presenter: Tiana Aden

Mentor: John Capodilupo

Alzheimer's is an irreversible progressive brain disorder that slowly destroys memory and thinking skills, and

eventually the ability to carry out the simplest tasks. As of today, there is not a cure for this disease, however recent medical advancements have brought us closer to effective treatment. Alzheimer's disease is currently recognized as one of the most prominent and important medical problems in older people to date. To date, the only treatments for Alzheimer's exist solely to treat the symptoms associated with the disease and not to stop its progress.

However, recently, there has been an emergence of groundbreaking and promising treatments that aim at slowing and ultimately stopping the progression of the disease altogether. The purpose of this research is to examine this debilitating disease and the promising outlook of the future treatments and cures, as well as informing the public about this information.

HENRY HALL ATRIUM 023

Does GVSU Support Working Students' Mental Health?

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

Presenter: Hannah Kelly

Mentor: Hsiao-ping Chen

In a survey comprised of 25 working students at GVSU, it was determined that student mental health is affected by student employment. 48% of student workers interviewed claimed to have their mental health negatively affected by their jobs, and 68% of students felt more stressed on days that they work. In addition to this 32% of students claimed that their grades are negatively affected by employment. When asked whether student workers felt supported by GVSU in general on a scale of 1-5, 1 being not at all supported and 5 being very much supported, only 24% of students rated GVSU a 4 or 5. In addition to this, 56% of students stated that they received little to no support at all from GVSU professors when it came to student work. These numbers are staggering because they show that working students are in need of additional support from GVSU, and that improvements must be made to the current atmosphere surrounding student workers.

HENRY HALL ATRIUM 024

Examining the Growth of *C. albicans* Filamentous Mutants In Embedded Conditions

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

Presenter: Curtis Mack

Mentor: Ian Cleary

Candida albicans is an opportunistic fungal pathogen and a member of the normal human microbiota. Various environmental conditions stimulate changes in cellular morphology, one being growth embedded in solid media. Examination of scientific literature revealed that several mutant strains known to grow filamentously under yeast conditions had not been tested in embedded growth. One example is a strain over-expressing the transcription factor SFL2. Our initial goal was to close this gap in our knowledge of these strains. Interestingly, our experiments revealed that over-expression of SFL2 was also able to overcome the repression of filament induction that results from over-expression of the repressor NRG1. This effect appears to be specific to embedded conditions since in several liquid media tested simultaneously over-expression of SFL2 and NRG1 produces only elongated yeast cells.

HENRY HALL ATRIUM 025

Diet Isotope Analysis of Individuals from the Earliest Neolithic Farming Settlement in Central Europe

Participants attending 1:00 PM - 2:00 PM

Presenter: Jessica Hoover

Mentor: Alexey Nikitin

Agriculture arrived in Europe 7,500 years ago, brought by migrants from western Anatolia (present day Turkey). It has been assumed that Anatolian farmers had established a viable producing economy shortly after their arrival in Europe, but the extent of their reliance on agricultural crops and domesticated animals in the early years of their residence in Europe is still unclear. Brunn 2, the earliest phase of the archeological complex at Brunn am Gebirge, Wolfholz near Vienna, Austria, belonging to the Formative phase of the Linearbandkeramik (LBK) culture, contains burials of members of an LBK farming community several generations post-arrival of Anatolian migrants in central Europe. An analysis of stable isotope ratios of carbon and nitrogen from the Brunn 2 remains allows the diet of the earliest European farmers to be directly evaluated.

HENRY HALL ATRIUM 026

Modifications and Improvements to a Precision Spectrometer for Gas Samples

Participants attending 9:00 AM - 10:00 AM

Presenters: Salvatore Curcuru, Theodore Schultz

Mentors: George McBane, Stephanie Schaertel

Several modifications have been made to a high-precision near-infrared spectrometer used for lineshape measurements in gases. The multipass sample cell has been converted from a 31-pass to an 11-pass configuration and the optical design of the spectrometer has been modified to send more of the available laser light through the sample. These changes were intended to improve the signal-to-noise ratio and the baseline flatness of the spectra. The vacuum design has been changed in order to improve gas mixing times and permit more stable measurements with shorter waiting periods between gas injections. These modifications and their effects on pressure broadening measurements on carbon monoxide will be described.

HENRY HALL ATRIUM 027

Reducing an Impact Bias Towards a Health Food

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

Presenters: Hope Holyfield, Alyssa Langenberg

Mentor: Amanda Dillard

In this study, we tested if there was an impact bias for a health food and if such a bias could be reduced with an adaptation exercise. First, participants read a message about the health benefits of kale. Following this, one-half of participants were randomly assigned to an adaptation recall exercise in which they wrote about how emotions weaken over time. All participants then ate kale and then reported their experienced emotions. Findings indicated that participants showed an impact bias towards kale: they overestimated the negative emotion they would experience and underestimated the positive emotion they would experience. Although the adaptation exercise did not reduce these biases, those who did the adaptation exercise ate more kale and reported higher intentions to eat kale in the future (relative to the control group). These results suggest that reminding people of their ability to adapt could motivate healthier choices that they may initially have negative affect toward.

HENRY HALL ATRIUM 028

Development of International Community Based Learning Programs

Participants attending 9:00 AM - 10:00 AM

Presenters: Lauren Butzer, Hannah Hooton

Mentor: Lorie Tuma

Over nine years, 121 students have coordinated events at the American Pavilion and participated in program planning at the International Cannes Film Festival under the direction of Dr. Lorie Tuma. This case study outlines the process involved in creating authentic [international] community-based learning opportunities for hospitality and event students. Analysis includes why international experiences are important for students, the need for partnerships, the impact of relationships on a program, and the process involved in student recruitment. The case demonstrates the difference between traditional study abroad programs and community-based learning programs as they align with specific curriculum and learning outcomes. Recommendations and implementation include the appointment of two undergraduate instructional leaders who will use this construct as a bilateral model to create a new experience for students who desire to participate in the same capacity at the Tokyo Olympics in 2020.

HENRY HALL ATRIUM 029

The Effect of Degenerative Eye Disease on Social Relationships

Participants attending 2:00 PM - 3:00 PM

Presenter: Rachel Bushey

Mentor: Tara Hefferan

Degenerative eye diseases (DEDs) such as macular degeneration and glaucoma are responsible for a progressive reduction in vision in upwards of 14 million patients in the United States. Vision loss causes many changes, including personal struggles in and out of the home. These patients are commonly supported in their mental health and in adapting their home environment, but there is a little known about how their casual and familial relationships are impacted by the DED. DED patients were recruited to take an online survey about their disease and any modifications they had made in their home and life. Some responders participated in a semi-structured interview to provide further insight into how their social relationships had changed or are changing. This information was analyzed to identify trends to better help the DED community understand the changes that may be experienced while living with the disease.

HENRY HALL ATRIUM 030

Anisotropic Variation in the Collagen Fiber Structure of Macaca Pericardium

Participants attending 3:00 PM - 4:00 PM

Presenter: Michael McCabe

Mentor: Chris Reed

The pericardium is a fibrous sac which encloses the heart, stabilizing it as it contracts. Previous research has demonstrated that the collagen fibers which primarily constitute its structure may be anisotropic. That is, oriented in a preferred direction. However, the degree of anisotropy can vary with both species and position on the heart. To date these variations have only been investigated with a limited number of species. Therefore, in this study we sought to determine what, if any, anisotropic variation exists in the pericardium of *Macaca fascicularis* and *M. mulatta*, representing a novel model of pericardial anisotropy. To assess anisotropic variation, *Macaca* hearts were obtained whole, and the pericardium dissected to obtain samples overlying the right and left ventricles and apex. Samples were sectioned, stained, photographed. The resulting images were analyzed to determine fiber anisotropy. Anisotropy ratings from each location were compared to determine variation.

HENRY HALL ATRIUM 031

Mechanistic Exploration of Ketenimine Formation at Cobalt Bis(Alkoxide) Centers

Participants attending 2:00 PM - 3:00 PM

Presenter: Nicholas Dewey

Mentor: Richard Lord

Ketenimines are a useful synthetic starting point for making heterocycles in materials and pharmaceutical applications because they are high-energy species. The sustainable synthesis of such species presents a chemical challenge if the reaction is to be done in an atom-economical fashion. Recent work has shown that the first isolable high-valent cobalt carbene can transfer its carbene moiety to isocyanide and form ketenimines. Unfortunately, the reaction only happens once and not in the desired catalytic (repeatable) fashion. This project sought to better understand this transformation and improve its design to become catalytic through computational modeling and density functional theory.

HENRY HALL ATRIUM 032

Material, Type, and Weight Aesthetic Standardization of Balance Pan Weights in Nippur

Participants attending 12:00 PM - 1:00 PM

Presenter: Molly Dlugos

Mentor: Elizabeth Arnold

Balance pan weights used in Mesopotamia have standards of measurement, especially weight units. These units indicate economic activity such as manufacture and trade. The weights have distinctive characteristics of material and type that showcase an aesthetic standard also present during this period, 2500-750 BCE. The most common material used is hematite and the most common type is sphendonoid. The correlation between the two demonstrates a standard that exists within the aesthetic characteristics of balance pan weights.

HENRY HALL ATRIUM 033

An Examination of Partial Hip Replacements and the Prevalence of Intraoperative Fractures of the Femur

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

Presenter: Aaron Muscaro

Mentor: Timothy Strickler

The purpose of this project was to dissect a cadaveric hip that had undergone orthopedic replacement in order to plastinate the specimen for future educational use. Beginning in October 2018, dissection of the 86-year-old male cadaver was completed over the subsequent four months. In order to locate the orthopedic repair, the pelvis was hemi-sected and disarticulated from the body. The type of orthopedic repair was confirmed to be a partial hip replacement, or a replacement of the femoral head with a prosthetic metal ball. In addition to the hip prosthesis, a metal-plate was found along the femur shaft indicating a fracture of the femur. While hospital records could not be obtained to show the cause of this injury, literature has shown the prevalence of intraoperative fractures of the femur. Following plastination of the hip specimen, a literature review was conducted to further investigate intraoperative femoral fractures in orthopedic hip replacement cases.

HENRY HALL ATRIUM 034

Structural and Functional Analysis of Bacilithiol-conjugate Amidase Involved in

Bacillithiol Recycling

Participants attending 1:00 PM - 2:00 PM

Presenter: Michaela Castleman

Mentor: Paul Cook

Bacillithiol (BSH) is present in many gram-positive organisms such as the pathogenic *Bacillus anthracis*. This compound helps maintain redox homeostasis, detoxifies xenobiotics, and enables resistance against the FDA-approved antibiotic fosfomycin. The BSH biosynthesis pathway has three enzymes: BshA (replaces the UDP group of UDP- *N*-acetylglucosamine with a malate group), BshB (a zinc-dependent deacetylase that produces glucosaminyl-malate), and BshC (putative cysteine ligase). Once BSH is bound to a toxin, the bacillithiol-conjugate amidase (BCA) acts to recycle the glucosaminyl-malate back into the biosynthesis pathway. Currently, there is no X-ray crystallographic structure of BCA solved, therefore this project focuses on obtaining a structure of BCA from *B. thuringiensis* and *B. licheniformis*. The analysis of these enzymes gives insight into their functions, which may assist the development of inhibitors to combat fosfomycin resistance through repression of BSH production.

HENRY HALL ATRIUM 035

Kalamazoo City Community Analysis

Participants attending 9:00 AM - 10:00 AM

Presenter: Anya Ward

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Kalamazoo, Michigan, obtained from the American Community Survey.

HENRY HALL ATRIUM 036

Exploring Differences in Partial Credit Among Chemistry Faculty

Participants attending 10:00 AM - 11:00 AM

Presenter: Charissa Kashian

Mentor: Nathan Barrows

Students who go through general chemistry can have very different experiences based on their professor. Every professor has a different background and learned how to grade in different ways. This causes students to have very different scores on almost identical questions, which causes much frustration in many students. This issue is also growing with a mandatory common final exam occurring in CHM 115. This study aims to understand how and why professors assign partial credit to short answer questions, with a goal of creating a common rubric for professors to use in order to standardize partial credit grading. In order to achieve this, general chemistry professors were invited to participate in two interviews that required them to assess student answers to seven standard general chemistry questions. Participants were then asked to discuss general background questions and other experiences. The results and recommendations for practice will be presented.

HENRY HALL ATRIUM 037

Images of Nursing from West Michigan: A Photo Ethnography

Participants attending 9:00 AM - 10:00 AM

Presenter: Aldina Mahmutovic

Mentor: Susan Strouse

The image of nursing is diverse and complex, yet few recent studies consider how nurses view their professional image. This study aimed to uncover how West Michigan nurses perceive the image of nursing. Approval was given by Sigma-Kappa Epsilon at Large, to recruit participants from members, and by Grand Valley's IRB. Via an online REDCap survey, participants submitted an original photo and written narrative. Before starting, participants consented to use of their submissions in dissemination. Submissions were searched for underlying patterns using thematic analysis (Leininger, 1991). Themes identified were: (1) nurses establish relationships with unique and vulnerable clients, using their insight to act as sources of peace, care, and compassion; (2) nurses are strong, knowledgeable professionals who utilize creative and critical thinking to address clients' complex, and at times urgent, healthcare needs. The results indicate a need for better communication of positive nursing images.

HENRY HALL ATRIUM 038

Characterization of Putative *Salmonella enterica* Serovar Typhimurium Virulence Genes

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

Presenter: Luke Rozema

Mentor: Aaron Baxter

Salmonella enterica serovar Typhimurium is a Gram-negative pathogen responsible for a large percentage of food-borne illnesses in the US each year. Upon entry, *S. Typhimurium* invades the epithelial cells and Peyer's patches of the small intestine via a type III secretion system. Invasion requires a region of the genome known as *Salmonella* Pathogenicity Island 1 (SPI-1). Central to the upregulation of SPI-1 is the gene *hilA*, which is both positively and negatively regulated via a series of proteins that senses the bacteria's current environment. One of the major negative regulators of *hilA* is the gene *hilE*. Previously, it was found that the genomic area around *hilE* carries key characteristics commonly seen in pathogenicity islands. The purpose of this research is to characterize the effects two polar mutations (4501 and 4502), located in this region have on virulence. This was done by measuring *hilA* expression, motility, and invasion of these mutants compared to wild type bacteria.

HENRY HALL ATRIUM 039

Ghanaian Girl: A Guide To Your Body

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

Presenter: Alaina White

Mentor: Karen Zivi

In preparation to study abroad in Ghana, I researched the stigmatization against menstruation in West African communities and uncovered the harsh, harmful conditions women face everyday during menarche. Social stigmas and unsanitary conditions lead to shame, illness, and sometimes even death. While in the village of Winneba, my peers and I visited a primary school where we hosted a workshop that taught the younger girls how to make reusable sanitary pads using available resources. This became the inspiration for my children's book, "Ghanaian Girl: A Guide To Your Body." The content of the book is tailored specifically to meet the needs of Ghanaians, with instructions for making reusable sanitary pads included in the back. The aim of my book is to provide educational materials on reproductive health to Ghanaian youth, a resource that can be read in private without shame or embarrassment. Copies of the book will be distributed to primary schools in Winneba this upcoming summer.

HENRY HALL ATRIUM 040

The Sea Witch vs. the Bad Boy: Men in the Mother Role of *Hairspray*

Participants attending 4:00 PM - 5:00 PM

Presenters: Laura Bianchi, Delaney Brummett, Mallory Stevenson
Mentor: Kathryn Remlinger

This study relies on discourse analysis and performance theory to compare the language use in the representations of femininity of the protagonist's mother, Edna Turnblad, in two versions of *Hairspray*. In the original 1988 film, the drag queen Divine plays Edna; however, in the 2007 rendition, John Travolta — an actor known for masculine characters — plays Edna. While both renditions of the film are comedic, the portrayal of Edna differs greatly between them. Through our preliminary analysis of the stylistic and prosodic features (e.g. pitch and tone) as well as speech acts, we have found marked differences in how the two actors linguistically perform femininity. For example, in the the 1988 version Divine relies on features not stereotypically associated with feminine characteristics such as swearing, and in the 2007 remake Travolta emphasizes stereotyped femininely-indexed linguistic features such as heightened pitch and lack of agency (needing to be verbally prompted into action).

HENRY HALL ATRIUM 041

Preventative Conservation of Family Collections

Participants attending 10:00 AM - 11:00 AM

Presenter: Marisa Stankov

Mentor: Sigrid Danielson

Families who wish to preserve their heirlooms and hand them on to the next generation may face challenges such as a limited budget or limited access to the institutional resources available to museums. For my honors senior project, I am creating a conservation plan for my parents' collection. This plan addresses how to maintain the photographs, coins, and documents my parents want to have preserved. I am determining cost-effective options for storage units, as well as how to integrate a storage space into the house where environmental risks, such as humidity, can be monitored. I will share my conservation plan and helpful resources for family collections during the poster session of Student Scholars Day.

HENRY HALL ATRIUM 042

Implications of Fibromyalgia in the Juvenile and Young-Adult Population

Participants attending 9:00 AM - 10:00 AM

Presenter: Laura Galligan

Mentor: Genevieve Elrod

An overview of relevant research regarding fibromyalgia in this population was conducted through a search on the databases Pubmed and CINAHL. Studies regarding the correlation between physical, emotional, and sexual abuse and chronic widespread pain are discussed. Other data regarding genetics, stress, growth and development, cognitive behavioral therapy, and pharmacology are also investigated. The concluding argument is: this population is being treated in the same ways as the adult population without data that supports this strategy. More research needs to be done regarding fibromyalgia in this population. This is a valuable argument because up to 0.9% of young adults (age 20-29) have fibromyalgia (as cited in Gündüz et. al, 2017, p. 91) but there is no evidence-based treatment to ease their symptoms. A lack of effective treatment will influence their lifelong physical and psychological well-being.

HENRY HALL ATRIUM 043

Using Macroinvertebrates as Bioindicators: An Assessment of the Ecological

Restoration of Muskegon Lake, Michigan

Participants attending 1:00 PM - 2:00 PM

Presenter: Rachel Orzechowski

Mentor: Alan Steinman

Three shoreline sites in Muskegon Lake, a drowned rivermouth lake in west Michigan, were surveyed for aquatic macroinvertebrates using artificial substrates (Hester-Dendy plates). Hester-Dendy samplers were replaced monthly in three locations at each site from September 2018 to January 2019. Samples were taken from three habitats with different vegetation cover: submergent (25%-49% submerged vegetation); emergent (1%-24% emerged vegetation); and open (0% total surrounding vegetation). A similar study conducted in the summer of 2018 found the two sites most dominated by aquatic plants had lower species richness than the open site and were associated with low dissolved oxygen (DO) and cooler water temperatures. In contrast, the open site had higher overall macroinvertebrate diversity and was associated with high DO and warmer water. These unexpected results led to the current study, comparing the influence of different habitats on macroinvertebrate richness and diversity.

HENRY HALL ATRIUM 044

College Activism: The Ways and the Reasons

Participants attending 3:00 PM - 4:00 PM

Presenter: Patricia Durell

Mentors: Julia Mason, Leifa Mayers

Activism is a malleable concept which serves as a driving force behind human rights efforts, social justice movements, and movements towards equality. This project examines the relationship between college students and an activist identity through interviewing self-selecting college students between the ages of 18-42 who identify as activists. I will be using feminist discourse analysis grounded in feminist standpoint theory. The women's studies field is closely related to activism as they both promote the empowerment, equality, and inclusion of minority voices. This study will support an analysis of the relationship between the field and activism through highlighting young voices from varying backgrounds, focusing on their journeys with activism and, potentially, oppression. The project's narrative analysis and intersectional lens will explore individual stories of activism and analyze how identity politics, systems of power, and discrimination affect different identities.

HENRY HALL ATRIUM 045

The Combinatorics of RNA

Participants attending 10:00 AM - 11:00 AM

Presenter: Katrina Teunis

Mentor: Lauren Keough

RNA, much like DNA, is made up of four building blocks called nucleotides, Adenine, Guanine, Cytosine, and Uracil. These nucleotides form a string that likes to fold in on itself and bond together - Adenine with Uracil and Guanine with Cytosine. The order and number of nucleotides present will determine how many ways the string of RNA can fold. Using these guidelines, we move into the theoretical and consider what happens when we have $2n$ nucleotides, where n is a natural number. For strings containing only one type of nucleotide and its bonding pair, we determined how to build a string that will fold $n+1$ different ways for all n that is not one less than a prime number. We also found transformations on words that can be used to produce other words with the same foldability as the original. This research was funded by the Modified Student Summer Scholars Program from the Office of

Undergraduate Research at Grand Valley State University.

HENRY HALL ATRIUM 046

An Evaluation of Antibiotic Prescribing Habits Over a 5-year Period

Participants attending 1:00 PM - 2:00 PM

Presenter: Brittany Kovaly

Mentor: Babasola Fateye

Context: Stewardship efforts put forth by the CDC call for monitoring of unnecessary antibiotic use as a tool in evaluating and improving prescribing habits to reduce antibiotic resistance. Objective: This study will observe antibiotic prescription habits at West Michigan health system over a 5-year time period and classify based on diagnosis, facility type, and graphical distribution of patients. Design: This is a retrospective review of antibiotic use within a West Michigan health system. Outcome Measures: This study aims to evaluate changes in antibiotic use overtime, observe unnecessary antibiotic prescriptions by evaluating the number of antibiotics prescribed for viral infections and track antibiotic prescription rates in relation to patient zip codes. The results of this study will determine if the increased efforts to minimize antibiotic use in recent years have been effective. It will also establish if there is a need for further education on viral disease treatment.

HENRY HALL ATRIUM 047

Gaining Legitimacy through Literature? An Analysis of Indian English

Participants attending 2:00 PM - 3:00 PM

Presenter: Grace Irwin

Mentor: Dan Brown

World English is the study of different varieties of English around the world. One of the oldest non-native varieties with the richest history is Indian English. For much time, the term 'Indian English' was used as a semi-pejorative term for uneducated usage. More recently, however, Indian English is gaining legitimacy, both in the eyes of its speakers and in the eyes of the world. This presentation has three parts: a linguistic analysis of Indian English showing how it has unique characteristics, based on speech samples from two YouTube videos; a sociolinguistic analysis of the variety showing how a YouTube video in which speakers of Indian English were interviewed about their variety indicates more positive attitudes of Indian English speakers toward their variety; and an analysis of how Indian English has been used in literature and how such literature may have helped this variety gain legitimacy, as Indian writers have been awarded prestigious prizes for their works.

HENRY HALL ATRIUM 048

β -synuclein as Treatment for Parkinson's Disease: A Study in Fly

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

Presenters: Diego Flores, Gage Paul

Mentor: Sok Kean Khoo

Parkinson's disease (PD) is the second most common neurodegenerative disorder that impacts 1-2% of the elderly population. PD is characterized by the loss of midbrain dopaminergic neurons, leading primarily to motor impairment. Another hallmark of PD is α -synuclein (α -syn) protein aggregates, also known as Lewy bodies. Lewy bodies can be targeted by β -synuclein (β -syn) a protein homolog that has been shown to reduce α -syn aggregation in cell and mouse models. In *Drosophila melanogaster*, α -syn is expressed within its nervous system

by inserting human α -syn gene into its 3rd chromosome. The flies are fed β -syn peptide in a dose dependent, controlled environment. The effect of Lewy bodies inhibition by β -syn will be assessed by locomotion assays and immunofluorescence microscopy to visualize protein aggregation in fly brain. The use of β -syn to treat motor impairment and protein aggregation in fly can potentially lead to novel and noninvasive treatments for patients.

HENRY HALL ATRIUM 049

Synthesis and Characterization of N-Methylaniline Substituted Iron-Alkene Complexes

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

Presenter: Andrew Laduca

Mentor: Stephen Matchett

Asymmetry in metal-olefin bonding (measured by crystal structures, or inferred from the ^{13}C NMR) has direct implications for the reactivity of the resulting metal-olefin complexes. Previous literature work (involving 3 complexes) has shown that when the bond is only slightly asymmetric, nucleophilic reactivity increased. However, if the bond is too asymmetric, the compound becomes unreactive. The over-arching goal of our research is to synthesize a large set of iron complexes that exhibit a wide range of metal olefin asymmetries and thus make the definitive link between structure and reactivity. While several classes of iron olefin complexes have previously been made in our laboratory, the current work focuses on the synthesis and characterization a series of N-methylaniline substituted iron-alkene complexes. Analysis of ^{13}C NMR and XRD data shows them to be very asymmetric. When the series is completed, we will then focus on measuring the kinetics (reactions rates) for each.

HENRY HALL ATRIUM 050

Detroit Community Analysis

Participants attending 1:00 PM - 2:00 PM

Presenter: Richard DeBerry

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Detroit, Michigan, obtained from the American Community Survey.

HENRY HALL ATRIUM 051

Localization of Histamine in the Male Accessory Gland and its Influence on Post-mating Responses (PMRs) of Females in *Drosophila*

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

Presenters: Madeline Allen, Lauren Gerritsen, Anna Prince

Mentor: Martin Burg

This study is the first to localize histamine to the secondary cells in the male accessory gland of *Drosophila*. The secondary cells of the accessory gland that histamine was localized in are known to be required for the induction of post-mating responses (PMRs) in females. These PMRs, induced when males copulate with females, include responses such as egg laying, sperm viability, and courtship rejection. To investigate whether these PMRs are affected when histamine is absent, normal females underwent a courtship conditioning with either normal males or *Hdc*^{JK910} mutant males, which are unable to synthesize histamine. Results indicate that a lack of histamine in males affects egg laying 2 days after courtship conditioning, while courtship rejection was altered 4 and 10 days after courtship conditioning with *Hdc*^{JK910} mutant males. Further studies are being done in order to develop a more

complete histamine localization within the secondary cells of the accessory gland.

HENRY HALL ATRIUM 052

Metal Ion Analysis of a Hydrolase Involved in Bacillithiol Metabolism

Participants attending 1:00 PM - 2:00 PM

Presenter: Shea Siwik

Mentor: Paul Cook

Bacillithiol (BSH) is a compound found in some pathogenic species such as *Staphylococcus aureus* and contributes to resistance against antibiotics such as the FDA-approved fosfomycin. The biosynthesis of BSH is composed of three enzymes. BshA uses UDP- *N*-acetylglucosamine (UDP-GlcNAc) and malate to produce GlcNAc-mal. BshB is a zinc deacetylase that produces GlcN-mal, and BshC acts as a putative cysteine ligase to produce BSH. Once BSH is attached to a toxin, the bacillithiol-S-conjugate amidase (BCA) results in a cysteine-bound toxin and GlcN-mal, which is recycled back into the biosynthesis pathway. In *Staphylococcus* organisms, the activity of BshB and BCA is performed by one enzyme, the bacillithiol-related amidase/deacetylase (BRAD). While BRAD is believed to use Zn^{2+} as its preferred metal cation, other metals were evaluated, with Mn^{2+} producing the most robust response. The current focus is to observe the effects of varying metal concentrations on its activity.

HENRY HALL ATRIUM 053

Assessing Sex and Age of Non-Adult Humans from Umm-el-Jimal, Jordan

Participants attending 2:00 PM - 3:00 PM

Presenter: Cecelia Roehm

Mentor: Gwyn Madden

The use of the occipital and temporal bones of the skull allow for an estimation of the age and sex of non-adult individuals, and this analysis will be performed on individuals from the Umm-el-Jimal site in northern Jordan. This research is being conducted in order to test the reliability of the aging and sexing methods presented by researchers in regards to using the occipital bone for age and the temporal bone for sex of non-adult humans. This study builds on previous research done on area BB:2 from Umm-el-Jimal, Jordan (Madden, G. and J. Brashler 2011). The goals of this paper are to understand what the minimum number of non-adults from area BB:2 is, and what the age range of these individuals are. Also, these methods will be looked at for reliability of aging and sexing non-adult individuals in the archaeological record. The methods employed in this study will be compared with methods applied by Madden and Brashler 2011.

HENRY HALL ATRIUM 054

A New Extraction Method of the Essential Oil from Anise Hyssop

Participants attending 9:00 AM - 10:00 AM

Presenters: Brooke Maguire, Breezy Squires

Mentors: Dalila Kovacs, James Krikke

Anise Hyssop, a perennial flower native to the Great Plains of North America, is known for containing an intense anise-mint aroma. The plant is also less commonly known for its ability to be used as an insecticide and to protect against infections. Estragole, the main volatile compound of the essential oil extracted from anise hyssop, is a common flavoring additive. This research tested a new method for extraction of estragole. Instead of using a traditional steam distillation, an espresso coffee-pot was used to extract the estragole oil. The products of both

extraction methods were analyzed quantitatively and compared. Results showed that the coffee-pot extraction method was successful although it had a lower yield of oil than the traditional extraction. However the coffee-pot is much faster, uses less energy and shows fewer impurities. Less energy consumption and fewer impurities make the new extraction method greener, more environmentally friendly.

HENRY HALL ATRIUM 055

Acoustic Levitation Using 3 Dimensional Standing Waves: Theory and Demonstration

Participants attending 11:00 AM - 12:00 PM

Presenter: Brett Clark

Mentors: David Austin, Richard Vallery

Though the force of sound is rarely considered, acoustic (sound) waves are able to levitate small particles including ants and other objects. We approached acoustic levitation using standing waves from both a theoretical and experimental perspective. Our apparatus consisted of two transducers (effectively small speakers) facing each other separated by approximately 2 cm. We built up our theoretical model from fundamental acoustics and fluid dynamics, starting with analyzing first order acoustic effects and moving to considering second order effects such as acoustic scattering. Prediction of the pressure field and of how particles clustered stemmed from properties of the apparatus and the levitated particles. We made measurements on the position of levitated particles based on varying their mass. These measurements were compared to predictions in order to test the accuracy of the theoretical model.

HENRY HALL ATRIUM 056

Causes of Ordovician Aged Deformation within the Point Pleasant Formation in Northern Kentucky

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

Presenters: Diana Bullen, Leah Goodrich, Brendan Huehn, Eleanore Larson

Mentor: Peter Riemersma

Unique deformed and undeformed layering of shale and limestone occur at our outcrop of the Point Pleasant Formation. We hope to identify the deformation mechanisms that produced sinuous and inclined layers within otherwise parallel laminated bedding. The possible causes for such soft sediment deformation from the literature include seismic activity, liquefaction, turbidity currents, and sandy debris flows. We will be describing the textural properties in hand samples and thin sections to help identify the kind of deformation and differentiate between causal mechanisms. Microscopy will be used to identify any microstructures that may be present. Evidence of graded bedding would support a turbidite origin while floating clasts in a fine-grained matrix suggest a debris flow origin or liquefaction. We hope to develop a hypothesis for the sequence of events and mechanisms of deformation at our outcrop.

HENRY HALL ATRIUM 057

Language Ideology on Twitter: Spanish in the United States

Participants attending 3:00 PM - 4:00 PM

Presenters: Melissa Schmitz, Anna Shier, Alaina Wierenga

Mentor: Kathryn Remlinger

This study will examine the language ideology surrounding Spanish in the United States and how such attitudes

are used to perpetuate discrimination against Spanish speakers. We will be focusing on the language-based racial stereotypes and discriminatory practices that are seen on Twitter by using discourse analysis to examine the discursive practices used to express bias. Discursive features that we will examine include intertextuality, the incorporation of exterior texts into the text of interest, and interdiscursivity, which refers to the mixing of genres within a text. Preliminary research suggests that negative stereotypes and language-based bias against Latino/as and Spanish speakers in the United States are widespread and heavily normalized in American society through the culture of Twitter.

HENRY HALL ATRIUM 058

How Do Children Describe the People Around Them?

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

Presenters: Lauren Browning, Lindsey Carene, Alyssa Ford, Ericka Makowski, Melissa Sharapata

Mentor: Josita Maouene-Cavin

The objective of this study was to report developmental differences and similarities between younger and older children when producing descriptors of people. Previous studies exist for the characteristics of objects, but there is a lack of research on features describing people. 15 participants (ages 3.8-10.9) were recruited and asked three questions about 21 words (15 people and 6 objects). Each question prompted an answer about either appearance, behaviors, or contexts. The words were chosen from a list of early vocabulary norms. The children's judgments showed a significant gender difference overall, where boys provided 18% more characteristics than girls. The word that triggered the most descriptors was *you*, and the least was *doctor*. Older children produced 2/3 of the descriptors. The most common appearance based descriptors were body parts and accessories, the most frequent contexts were home/house/school, and the most common behaviors were general: *can*, *be*, *do*, *go*, and *make*.

HENRY HALL ATRIUM 059

The Effects of Rho-associated Kinase in Planarian

Participants attending 3:00 PM - 4:00 PM

Presenter: Madelynn Kelly

Mentor: Dawn Hart

Rho-associated kinase (ROCK) affects regeneration as it regulates the cytoskeleton. Within this lab, we explored what exactly the ROCK gene does to aid regeneration of the brain. We used dsRNA to knockdown ROCK and its functions then measured regeneration of the brain following amputation. To identify differences in regrowth, we measured the blastema to the whole body area of the planarians for ROCK and control RNAi groups. This resulted in blastema to body ratios that were similar across all groups. Therefore, we conclude that omission of the ROCK gene in planarian worms did not affect the regrowth of their brains. Perhaps more genes who share functions similar to ROCK need to be knocked down as well or the blastemal regrowth was successful but missing a specific cell type due to the silencing of ROCK. We expect this finding to aid in future experiments about ROCK and its role in regeneration and perhaps inspire a repeatable experiment knocking down genes with similar functions.

HENRY HALL ATRIUM 060

Puerto Rican English: Stateside versus Local Varieties

Participants attending 2:00 PM - 3:00 PM

Presenter: Thomas Rodgers

Mentor: Dan Brown

This research analyzes the features of Puerto Rican English (PRE) as it is used in stateside locations as well as the local setting. First, it defines PRE as an English variety at the sound, vocabulary, and grammatical level. This is accomplished through the analysis of speech samples from the Speech Accent Archive and the International Dialects of English Archive. Additionally, it considers the sociolinguistic context for PRE as well as the historical impact of English in Puerto Rico. Previous research on PRE and historical reference material was used to inform this component of the study. This study argues that PRE used in stateside locations differs from the variety used in Puerto Rico. Previous research has shown how contact with regional dialects in the United States can impact shifts in English varieties. This research demonstrates that the features of one English variety can shift based on its sociolinguistic placement and the proximity to other English varieties.

HENRY HALL ATRIUM 061

'Pride in my Philippine English!'

Participants attending 2:00 PM - 3:00 PM

Presenter: Abdulah Alasiri

Mentor: Dan Brown

Kachru attempted to categorize countries based on English nativity. This placed the U.S. and UK in what Kachru called the 'Inner Circle' and the Philippines in an 'Outer Circle.' However, when it comes to English's ownership and nativity, the literature reveals that the Philippines is not simply in an outer circle, but the Philippines itself has three circles of its own. In this literature investigation and review, the researcher investigated the Philippines' English variety by a linguistic comparison with the American English variety, as it is the mostly used variety due to the American colonization. Interviews were conducted with three female Filipinos. Conclusions reveal that Philippines' English variety is believed to be independent and Filipinos have pride in it.

HENRY HALL ATRIUM 062

China English? Where to Go? -The Future Direction of China English Development

Participants attending 2:00 PM - 3:00 PM

Presenter: Ruoxuan Sun

Mentor: Dan Brown

According to Kachru's English Nativity Circles, China English is a developing variety in the Expanding Circle. In the first part of the review, the researcher examined the unique features of China English in linguistic domains by extensive literature review and linguistic analysis. In addition, during the spread and localization of English in China, the increasing popularity of English has posed a threat to the native language and cultural identity in China. As a result, where to position English in China leads to an ambivalent debate among Chinese scholars and government policymakers. On the basis of this background, a survey was conducted through questionnaires to show participants' attitudes and opinions towards China English and its future. In the end, the researcher put forward her argument: instead of placing English in a threatening position, it's more meaningful and practical to 'enhance the English expression of Chinese culture and identity' (Gao, 2018).

HENRY HALL ATRIUM 063

Refining Your Reading Skills with the Prosody Training App and WALL-E Intonation Game

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

Presenters: Lucretia Dunlap, Michelle Roldan

Mentor: Jennifer Gross

Prosody refers to the melody of language. All languages have a distinct melody (music). Intonation and rhythm are a part of this melody. Intonation is the rise and fall of voice (“D’oh!”). Rhythm is the alternating patterns of stressed and unstressed syllables (PROduce; proDUCE). The meaning of a sentence, even a word, can change because of rhythm and intonation. Yet, written English offers few cues to extract the appropriate melody. Extrapolating from psycholinguistic theory, one goal of the study was to heighten readers’ prosody sensitivity by exposure to rhythm-enhanced text in the prosody training app. The second goal was to evaluate if intonation sensitivity was related to rhythm sensitivity by asking participants to play the WALL-E intonation game. In the game, participants deciphered the intentions underlying the robotic ‘conversations’ from the film. At all ages, prosody sensitivity plays a role in reading abilities.

HENRY HALL ATRIUM 064

Structural and Biochemical Characterization of OXA-24 β -lactamase and Novel Fragment-based Inhibitors

Participants attending 10:00 AM - 11:00 AM

Presenter: Uyen Pham

Mentor: Rachel Powers

β -lactams have been the most prescribed antibiotics since their introduction in the 1940’s. Extensive use of antibiotics has contributed to the emergence of bacterial defense mechanisms against β -lactams. The most concerning is the production of β -lactamase enzymes that catalyze the hydrolysis of the amide bond in the β -lactam ring, rendering the antibiotic inactive. One way to suppress the action of β -lactamases and overcome resistance is by identifying novel non- β -lactam-based inhibitors. Fragment molecule NK3 was found to inhibit OXA-24 β -lactamase, albeit with weak affinity. Analogs of NK3 were ordered and tested in kinetic assays in an effort to improve binding affinity with OXA-24. Of the analogs tested, a few showed improved binding affinity to OXA-24. To better understand the structural basis for this improved affinity, OXA-24 was crystallized and atomic level resolution structures of OXA-24 in complex with the analogs were obtained using X-ray crystallography.

HENRY HALL ATRIUM 065

Environmental and Kinetic Aspects of Polycyclic Aromatic Hydrocarbon Biodegradation

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

Presenter: Zachary Stuart

Mentor: Tara Kneeshaw

Polycyclic aromatic hydrocarbons (PAHs) are organic compounds formed by two or more fused benzene rings. They are widespread contaminants that enter the environment naturally (ex. from forest fires) and they pose a significant risk to human and ecosystem health. Recently, spills of oil known as diluted bitumen (sourced from tar sands) have emerged as a new source of contamination. Bacteria are capable of degrading these compounds through a process called biodegradation. These reactions are not well understood. Important aspects of these reactions include rates (to determine environmental persistence) and the products formed (to ensure they are safer than the parent compounds). This research evaluated known rates and products of the biodegradation reactions for specific PAH compounds, in particular those found in the area affected by the 2010 Kalamazoo River oil spill. Understanding the behavior of these compounds is important as the use of tar sands oils is becoming more prevalent.

HENRY HALL ATRIUM 066

Alternatives to the Visual Habituation Paradigm for Individuals with Disabilities

Participants attending 11:00 AM - 12:00 PM

Presenter: Paige Robinson

Mentor: Naomi Aldrich

Purpose: To compile and review existing research related to habituation methodologies for non-typical developing populations. Methods: A literature review was performed using five electronic databases to sort primary sourced studies published in peer-reviewed journals. Results: Eighteen studies were included in this literature review. Findings will be discussed in terms of participant population, habituation methodologies utilized, and efficacy of the different methodologies. Conclusions: Habituation methodologies utilizing physiological measures adapted for non-typical developing populations produced similarly effective results as data generated from the visual habituation paradigm. Further empirical evidence examining viable alternatives to the visual habituation paradigm for children and adults with disabilities is warranted.

HENRY HALL ATRIUM 067

Grand Rapids: A Rising Community

Participants attending 10:00 AM - 11:00 AM

Presenter: Alexandra Hunt

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Grand Rapids, Michigan, obtained from the American Community Survey.

HENRY HALL ATRIUM 068

How Does the Usability of Electronic Health Records Impact Provider Efficiency and Patient Safety?

Participants attending 9:00 AM - 10:00 AM

Presenter: Wanda Sankey

Mentors: Raymond Higbea, Guenter Tusch, Marie VanderKooi

Electronic health records (EHRs) have been implemented in many healthcare settings with the premise of increased productivity and improved patient interactions. 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, which could jeopardize patient safety and quality of care. Hence, analysis of the benefits and downfalls of the implementation of EHRs is a paramount step to improving provider-patient interactions and overall health. Prior review of the implementation of EHRs has been primarily focused on the hospital setting. Given the variability and importance of non-hospital medical centers, assessing the impact of EHRs to local offices is of exceptional importance. This study aims to better assess the implementation of EHRs by electronic survey and focus groups of local medical centers in an effort to improve patient safety and EHR usability.

HENRY HALL ATRIUM 069

Art and the Geometer

Participants attending 2:00 PM - 3:00 PM

Presenter: Katherine Yats

Mentor: Karen Novotny

Art and the beauty of mathematics have been inextricably linked since the beginning. Through an exploration of the properties of the Poincaré disk model of hyperbolic geometry and the hemisphere model of projective geometry, the most elementary elements of mathematics (parabolas, circles, polygons, ellipses, etc.) become the building blocks of art. Using ideal polygons, an intricate kaleidoscope effect is created in the Poincaré disk; congruent polygons and hyperbolic circles define a new perspective when searching for equivalency; and the curves of math's most basic functions introduce to the eye what mathematicians have always known: mathematics is the art of the soul.

HENRY HALL ATRIUM 070

Analysis of Dental Topography of Early Eocene North American Omomyids in the Bighorn Basin, Wyoming

Participants attending 4:00 PM - 5:00 PM

Presenter: Emily Elliott

Mentor: Laura Stroik

The Bighorn Basin in Wyoming provides fossil evidence of an explosion of diversity of mammalian species at the Paleocene-Eocene boundary. One of the most significant influences believed to have driven these evolutionary changes is the dramatic temperature increase of the Paleocene-Eocene Thermal Maximum. To determine the extent to which climate has influenced the evolution of these Eocene North American mammals, the association between temperature and dietary niche (reconstructed using relief index, a dental topographic measure) was examined for omomyid euprimates correlation analysis indicated that climate change and shifts in omomyid dietary niches are linked. ($P < 0.05$), providing further evidence of the significant role both biotic and abiotic environments play in species' niche and ecological community structure.

HENRY HALL ATRIUM 071

Analysis of Olfactory Compounds in Foods Eaten by Wild Common Marmoset Monkeys (*Callithrix jacchus*) in Brazil

Participants attending 11:00 AM - 12:00 PM

Presenter: Mary Price

Mentor: Cynthia Thompson

Many mammalian species use olfactory cues to determine the quality of food sources. The chemical richness (i.e. number of compounds) in foods' olfactory cues can communicate information that may influence feeding behavior. The chemicals present in two foods eaten by wild common marmosets, gum ($n=19$) and fruit ($n=12$), were analyzed using GC-MS. The recorded retention times were examined using NIST analysis to identify the chemical components present. Richness was compared across gum species, fruit species, and ripe and unripe fruits. Richness didn't differ between ripe and unripe fruits, fruit species, or gum species. Since there is no significant difference in richness between the samples, the olfactory cues utilized by marmosets for foraging doesn't appear to be dependent on the chemical richness of the food source. The factors influencing marmoset behavior likely rely on alternate chemical cue properties, such as variation in the presence or concentration of specific compounds.

HENRY HALL ATRIUM 072

Groundwater Springs Erode Sapping Valleys, and Moderate Stream Environments in Ottawa County, Michigan

Participants attending 10:00 AM - 11:00 AM

Presenter: Eleanore Larson

Mentor: Patrick Colgan

Sapping valleys are eroded by springs and their streams and moderate stream temperature and environments. We investigate if spring valleys in Ottawa County, Michigan were formed by sapping, and monitor spring discharge, sand transport, hydraulic head, temperature, and conductivity from May 2018 to March 2019. We observed daily and seasonal variations in hydraulic head, temperature, and conductivity in groundwater and springs. Spring-fed stream flow was ~50 gpm in summer and stage varied by < 6 cm seasonally. Spring temperature varied from 5 to 14°C and sand transport was continuous. The valleys meet criteria for sapping valleys (e.g. light-bulb shaped, steep-heads, 90° tributary junctions). Diurnal changes are driven by evapotranspiration and rainfall. Seasonal changes depend on aquifer recharge rates. In summer, the springs cool the valleys. In winter, the springs do not freeze and spring-head temperatures remained between 5° to 9° C, warming environments for plants and animals.

HENRY HALL ATRIUM 073

Puff Puff Passing Recreational Cannabis in Michigan: The Social Perspective of a Shop Owner

Participants attending 9:00 AM - 10:00 AM

Presenter: Brent Parzuchowski

Mentor: Brandon Youker

The 2018 election in Michigan, resulted in the passing of Proposal 1 legalizing the use of recreational marijuana for those over the age of 21. To ease the transition to legalization, policy makers, law enforcement, the judicial system, store owners, and researchers must collaborate to develop policies that are efficient and well regulated. This inquiry examines the policies, procedures, and impacts for those establishing a recreational cannabis. Preliminary discussions with current recreational cannabis store owners, finds the process confusing and arduous highlighting the difficulty of the licensing procedure and working with an outdated tracking system. Owners suggested a disconnect between those who create the policies and those who abide by them. This study gathered the perspectives of recreational cannabis experts' nationwide to develop a consensus on appropriate legalization policies. The findings will give policy makers a fuller picture of the issues as they determine policy.

HENRY HALL ATRIUM 074

Investigating Social Evolution Using *Salmonella enterica*'s production of Siderophores

Participants attending 12:00 PM - 1:00 PM

Presenters: Hunter Cochrane, Lindsay Vargo

Mentors: Aaron Baxter, Doug Graham

Evolutionary theory predicts that within any population of individuals cooperating to produce a common resource, natural selection will favor the appearance of 'cheaters:' individuals that don't expend the energy to produce the resource, but which nonetheless benefit from the contributions of others that do. Under certain conditions, cheaters will be at a competitive advantage over cooperators. We set out to engineer such a system using the bacterial species *Salmonella enterica* by creating a mutant strain with an entC gene deletion. This deletion shuts down the metabolic pathway that produces siderophores, proteins that are secreted into the environment that bind to a critical nutrient, iron, and facilitate its uptake. We tested the hypothesis that, when grown together under iron-limiting conditions, the entC mutant should exhibit greater growth rates than the wild type strain because it isn't exerting the

metabolic energy to transcribe, translate, and secrete siderophores.

HENRY HALL ATRIUM 075

A Semester of Hand Lettering

Participants attending 10:00 AM - 11:00 AM

Presenter: Noah Catton

Mentor: Vinicius Rebello Lima

Throughout the course of this semester, I have taken on the task of learning what is known as 'modern calligraphy', or hand lettering. This is an art form that is expressed through drawing letters, rather than writing them. The purpose of my presentation is to document the process by which I learned this skill and clearly show the steps by which I achieved this. The poster will be set up in a way to best show this visually, starting with the first item that I produced, including basic strokes and the use of a pointed pen, and ending with a physical representation, shown through a postcard of the skills that I now have, and the way they can be used functionally. I will also have a brief statement on the history of hand lettering/calligraphy, and the implications of how this skill will be effectively used in my future.

HENRY HALL ATRIUM 076

Synthesis of Anthranilic Acid Derivatives as Potential Anti-Microbial Agents

Participants attending 11:00 AM - 12:00 PM

Presenter: Mason Bergsma

Mentors: Bill Schroeder, Laurie Witucki

As drug resistant bacteria continue to surface, scientists must develop new compounds to combat these microbes. Biological tests on novel anthranilic acid derivatives have shown promising results for application as anti-microbial agents. The goal of this research is to synthesize anthranilic acid compounds and further investigate their biological properties. By varying the length of the carbon chain, adding halogens, and adding another amine group onto the parent compound, the Structure Activity Relationships (SAR) can be assessed. The final products will be characterized by NMR, TLC, and IR spectroscopy. Although further synthesis and analysis must be done, compounds of this type show a promising future as anti-microbial agents.

HENRY HALL ATRIUM 077

Harry Potter and the Silurian Stone Unraveling the Conditions that Produced the Silurian Bisher Formation Unconformity in Kentucky

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: Spencer Hower, Jason McWhinnie, Madeline Okkonen, Rachel Rilett

Mentor: Peter Riemersma

The mysterious nature of the unconformity can only be revealed by examining clues which exist within the cryptic, uppermost stone at the top of the Bisher Formation. The 444-million-year-old outcrop is composed of dolomite unconformably overlain by Ohio Black Shale that represents a drastic change in marine environment. We will investigate the processes that created the unconformity by studying the distinctive nature of the Bisher beneath the unconformity which contains pyrite, fossils, oil staining and burrowing. The processes of pyrite provides evidence of geochemical conditions in the marine sediments. Our investigation involves an analysis of fossil data, thin sections, hand samples and photographs of the outcrop. We hope to determine whether the unconformity was formed during

a period of low sea level or during a rising transgressive sea.

HENRY HALL ATRIUM 078

To Hyphenate or Not To Hyphenate? The Question to Ask Same-Sex Married Couples

Participants attending 4:00 PM - 5:00 PM

Presenters: Lesley Lobdell, Cassandra McCraney, Stacey Melville

Mentor: Kathryn Remlinger

The purpose of our research is to explore same-sex marriage titles. Aside from heterosexual women who choose to keep their maiden name, or those who utilize the honorific “Ms.”, same-sex couples are not left with clear-cut expectations/options concerning married names and honorific titles. Our research will delve into the idea of titles (Mrs, Ms, Mr), and names, in regards to same-sex civil partnerships or marriages. Our study is conducted through an analysis of same-sex celebrity couples, and their specific choices in regards to their titles and [last]names. This research is based on the theory of Performance of gender, which is reflected through the subjects’ language, more specifically in regards to use of titles and decisions of [last]names.

HENRY HALL ATRIUM 079

Origin of the Fossiliferous Limestone in the Kope Formation; Variability in Storm Frequency and Sediment Supply

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

Presenters: Kierstin Bachman, Ryan Karrip, Trevor Pickett, Daryn Taylor

Mentor: Peter Riemersma

The Kope Formation of northern Kentucky contains some of the most fossiliferous limestone in the world, though the conditions under which these layers formed are still highly contentious. This formation shows layers of silt- and clay-rich mudstone abruptly shifting to coarse-grained, fossil-rich limestone. One hypothesis is that high-energy storms winnow out mud and concentrate fossils. This alternates with periods of low energy and little storm activity, allowing mud to accumulate. An alternative hypothesis is that the abundance of fossils is the result of decreased sediment deposition rates or changes in sea level. To differentiate between these hypotheses, we will examine hand samples and conduct thin section point count analyses. Investigating the condition of fossils and relative amount of fine-grained mud in the limestone will be used to determine the depositional conditions and the most likely reason for the cyclicity in the Kope Formation.

HENRY HALL ATRIUM 080

Figuring Female Sexual Agency within Sex Advice Columns

Participants attending 11:00 AM - 12:00 PM

Presenter: Bianca Krause

Mentor: Julia Mason

Within contemporary society male sexuality is often prioritized and accounts of pleasure often exclude women. Illustrating the challenge of navigating sexual agency in an era where women are in constant struggle between embracing an active sexuality and adhering to restricting stereotypes, women’s sexuality is informed by popular culture. Prescribing specific scripts surrounding sexual roles and relationships, women’s magazines serve to reinforce women’s identity, agency, and sexuality. This research employs feminist content analysis to examine both quantitative and qualitative data to assess sex advice columns from *Cosmopolitan’s* website. Exploring how female

sexuality is constructed within these articles, this analysis contributes contemporary insights to the scripts regulating women as well as expands the conversation surrounding the representation of women's sexuality and agency.

HENRY HALL ATRIUM 081

The Effects of Two Key Cardiac Genes on Mouse Blood Pressure

Participants attending 11:00 AM - 12:00 PM

Presenter: Kyle Fish

Mentor: Francis Sylvester

The purpose of this study is to determine the effect of two genes that are important for myocardial growth and development on blood pressure (BP). These genes code for enzymes known as phosphatases which regulate the heart. We hypothesize that these genes also play a role in regulating vascular function. To test this hypothesis, we recorded the BP of knockout (KO) and wild-type control mice once a week. The KO mice are designated DUSP 6/8 as these mice are deficient in dual-specificity phosphatases 6 and 8. BP was recorded using Iworx's Labscribe 3 software and a pressure cuff that was connected to a computer-driven data recorder. The cuff was placed around the base of the mouse's tail, with a sensor secured distally to detect pulsatile blood flow within the ventral artery. The first recorded pulsatile response as the pressure in the tail cuff was released was used to determine the BP. These results will further our understanding of the role of DUSP6/8 in vascular function.

HENRY HALL ATRIUM 082

Exploring the Role of Chertification and Dolomitization on the Silurian Brassfield Formation of Northern Kentucky

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

Presenters: Aaron Hall, Jared Myers, Conner Palm, Kayla Schulte

Mentor: Peter Riemersma

The Brassfield consists of fossiliferous limestone at most locations, however at our outcrop it has undergone diagenetic changes that altered the lithology. Calcite in the limestone has been replaced by dolomite and chert. We will be focusing on the processes of dolomitization and chertification and determining the relative order in which they formed. Our method will be to examine hand samples and thin sections that were collected from the outcrop. As the dolomitization process commonly obliterates and removes fossils while chertification does not, we will look to identify if fossils are present in the chert nodules. If so, then we can conclude that chertification happened before dolomitization. If there are no fossils within the nodules, then dolomitization occurred first and destroyed any traces of fossils.

HENRY HALL ATRIUM 083

Origin and Growth of Freshwater Microbialites in Fish Lake, Michigan

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

Presenter: Lauren Chwojncki

Mentor: Peter Riemersma

Cyanobacteria were the dominant lifeform in our early earth and helped to create an oxygen rich atmosphere. Microbialites are dome-shaped carbonate nodules wrapped in a thin layer of cyanobacteria and are a rare occurrence that require unique conditions. This research investigates how the Fish Lake microbialites form, grow, and impact the local ecosystem. In addition to mapping water chemistry in the lake, a series of aquariums were

used to relate oxygen production (metabolic activity) over time to microbialite size. The amount of carbonate sediment produced by each microbialite was found to correlate with nodule volume. Microbialite communities are restricted to only specific parts of the lake and their distribution appears to be influenced by ground water influx, wave energy, and vegetation. Microbialites also provide a habitat and a tasty food source for macroinvertebrates in an otherwise muddy environment.

HENRY HALL ATRIUM 084

A Noncompetitive Inhibitor's Effect on the Processivity of Telomerase

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

Presenter: Anne Larson

Mentor: Agnieszka Szarecka

Telomerase (TERT) is active in 85-90% of human cancer cells, allowing for unlimited cell division by protecting the chromosomes and therefore enabling tumor growth. To prevent cell division in cancer cells, inhibiting TERT is an attractive solution as it is not expressed in healthy cells. A new TERT inhibitor, BIBR 1532, has proven promising in pre-clinical studies, however, research and drug design are limited by lack of structural data for TERT and poor understanding of TERT functional dynamics and mechanisms of allosteric inhibition. In this project we focus on the mechanism of BIBR's action. We present analysis of its binding to a pocket in the thumb domain of TERT, and its effects on TERT's dynamics based on three crystal structures of TERT. The understanding of vibrational modes of TERT and their modulation in the presence of inhibitors will help in optimizing drugs targeting BIBR's site and help identify other potential binding sites with a different effect on processivity.

HENRY HALL ATRIUM 085

Effects of Histamine Signaling on the pH Gradient in Both Larval and Adult Mid-gut of *Drosophila melanogaster*.

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: Sam Plaska, Kelly Tekiela, Joseph VanSlooten

Mentor: Martin Burg

The study of histamine function has been focused on its role as a neurotransmitter in the nervous system of *Drosophila melanogaster*, likely due to the limited knowledge of histamine's presence in other tissues. We report that histamine has now been localized to 4 regions of the larval gut. Of these regions, the copper cell region (midgut) is of particular interest, as copper cells are analogous to acid-secreting parietal cells of the vertebrate stomach. By feeding larvae the dye bromphenol blue, the pH of various gut regions can be determined. The pH of gut from *Hdc^{JK910}* histamine-deficient larvae and adults indicated a less acidic pH in the copper cell region than in normal flies. Gut tissue from the *ort^{P306}* histamine receptor-deficient mutant also display a similar phenotype, implying that histamine signaling plays a vital role in the regulation of acid secretion. These results implicate *D. melanogaster* as a potential model organism for the study of gut pH regulation.

HENRY HALL ATRIUM 086

Design and Manufacturing of 3D Printed Foot for High Cycle Count Compression Testing

Participants attending 11:00 AM - 12:00 PM

Presenter: Spencer Scarber

Mentor: Wendy Reffeor

This project optimized the material properties of a 3D printed foot model intended for high cycle count compression testing. Additionally, an analysis of 3D printing post processing was conducted to determine the most effective method by which a 3D printed foot could be altered following printing. Three separate filament fill densities were compressed under a 3000N load to simulate the forces of running. Material performance was based on a cubes ability to withstand the 3000N applied force without deforming plastically; a characteristic necessary to maintain the structural integrity of the foot model. The results indicated that the highest fill density performed the best for high cycle count compression testing using a 3D printed US male size 9 foot model. This research has implications in the biomechanical testing and additive manufacturing communities.

HENRY HALL ATRIUM 087

The Gravitational Signature of Asteroid Populations on LISA Orbits

Participants attending 10:00 AM - 11:00 AM

Presenter: David Bronicki

Mentor: Brett Bolen

We have modeled the effect of the asteroid belt on the LISA spacecrafts. To do so, we obtained orbital and other parameters of 700,000 belt asteroids from the Jet Propulsion Laboratory Small-Body Database. Since many of the masses are unknown, we used measured values of albedo, absolute magnitude, and asteroid type to estimate the individual masses via a Monte Carlo method. The asteroids and LISA spacecrafts orbits were then simulated, and the force of the asteroids on each spacecraft were calculated. We then generated several different scenarios by repeating the mass generation. This allowed for creating a statistical distribution of the asteroid belt on the LISA spacecrafts. We also expect to obtain a long-term secular influence on the LISA spacecrafts which may be obtained by perturbative methods.

HENRY HALL ATRIUM 088

Analysis of Cannabinoids in Commercial Hemp Supplement Products

Participants attending 10:00 AM - 11:00 AM

Presenter: Delaney Johnson

Mentor: Laurie Witucki

Hemp has been cultivated by humans for centuries for its use in textiles and medicines. There has been a large increase in the use of hemp-infused products, projected to be a \$22 billion industry in 2019—"The Next Gold Rush". The major chemical constituent in hemp oil is Cannabidiol (CBD), which is said to be beneficial for a variety of ailments including inflammation and arthritis, pain relief, and anxiety. This study investigates the presence of CBD in both human and pet health consumer products. Due to the large variety of products available (oils, baked goods, candies, etc.), various sample preparation techniques were developed prior to analysis with gas chromatography-mass spectrometry (GC-MS) to determine the presence of CBD and other terpenes in the prepared samples. A comparison of the chemical constituent profile of CBD vs. broad spectrum hemp oil containing products will be presented.

HENRY HALL ATRIUM 089

Health and Fitness Among College-Aged Enrollees in the UFIT Program

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

Presenter: Malia Brooks

Mentor: Christopher Dondzila

Introduction: College Campus Recreation programs are influential in shaping a college student's experience by encouraging physical activity throughout these formative years. Grand Valley's UFIT program provides students the opportunity to meet with Fitness Specialists to discuss their current health and wellness goals. Purpose: To assess the health and physical fitness in college-aged persons enrolling in the UFIT program. Methods: Intake assessments are conducted as part of enrollment in the UFIT program. Data from ten years of intake assessments will be analyzed from male and female participants aged 18-22 years. Health (body mass index, resting heart rate and blood pressure) and physical fitness (cardiovascular endurance, muscular strength/endurance, flexibility, and body composition) will be assessed by age, representing the progression through college. Results: Analysis of this data is currently in progress and will be presented at Student Scholar's Day.

HENRY HALL ATRIUM 090

Challenges in Surveying Quality Initiatives in US Hospitals

Participants attending 9:00 AM - 10:00 AM

Presenter: Jidnyasa Mantri

Mentors: Gregory Schymik, Guenter Tusch

The healthcare industry in the US is facing a move towards capitation that is driving a shift in focus from specific treatment outcomes towards the broader concept of the overall patient experience. This is changing the way health care systems look at quality of care and has driven them to apply well known quality improvement practices from the industrial sector to their businesses. Prior work identified six factors that drive quality outcomes. This research is an attempt to build a survey instrument based on published, validated instruments to measure those factors at the hospital level. Our finding is that most research has been done investigating a specific unit in the hospital focusing on the perspective of the employees in the unit. These surveys do not translate well to an industry-wide investigation of the overall hospital quality culture. Future research will concentrate on the development of a new instrument focusing on the hospital quality culture as the unit of analysis.

HENRY HALL ATRIUM 091

Population Growth in Ann Arbor Over the Years

Participants attending 9:00 AM - 10:00 AM

Presenters: Jeramie Barnes, Keagan Finch

Mentor: Mark Hoffman

A visual community profile of the population of Ann Arbor, Michigan, obtained from the American Community Survey.

HENRY HALL ATRIUM 092

Analysis of the Drug Binding Effects in the GABA(A) Ligand Gated Receptors and Ion Channels

Participants attending 11:00 AM - 12:00 PM

Presenter: Rose Lizzo

Mentor: Agnieszka Szarecka

CYS-loop receptors, e.g. GABA(A), are involved in neurotransmission and belong to a large family of diverse proteins implicated in cognitive and neurological functions. GABA(A) receptors are drug targets for anxiety,

depression, psychosis, and anesthesia. In this project, we focus on analyzing the binding modes of various modulator drugs in the cryo-EM structures of human GABA(A) receptors. Mechanisms of action of these drugs are poorly understood. Here we report on the structural changes in the receptor binding pockets, namely the backbone conformation and side-chain interactions with different drug ligands. We use Normal Mode Analysis to determine the differences in the protein motions during ligand binding. Our structural analysis shows that the binding pockets for Xanax and diazepam are very similar while that of bicuculline differs considerably. This project will shed light on the allosteric effects in the CYS-loop family, leading to drugs tailored for specific receptor subtypes.

HENRY HALL ATRIUM 093

Statistical Consulting Center (SCC) Activity Report

Participants attending 1:00 PM - 2:00 PM

Presenters: Samantha Milano, Abigail Zysk

Mentor: Bennett Otieno

The mission of the Statistical Consulting Center (SCC) is to enhance university research efforts by offering quality statistical advice to faculty and student projects, and to develop collaborations with West Michigan businesses through consulting projects. The success of the SCC is driven by client need, student talent, director's dedication, and support from the Department of Statistics, CLAS and The Graduate School. The SCC is used by a variety of students and faculty from all departments, and individuals representing West Michigan businesses throughout the entire year. Also, clients often visit the SCC more than once, with a variation of motives and intentions. Using a variety of different software programs including R, SAS, and Python, this project aims to provide useful insights on the significant impact the SCC has within the university and the outside community, and present graphical summaries of relevant SCC data.

HENRY HALL ATRIUM 094

Genetic Regulation of *Escherichia coli* Biofilm Formation Under Various Oxygen Conditions

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

Presenters: Sean DeLong, Michael Garnaat

Mentor: Aaron Baxter

Biofilms increase the ability of *Escherichia coli* to colonize and survive within an environment. The bacteria form a community of cells that adhere to surfaces providing protection and nutrients for the bacteria. *E. coli* is predominately a commensal organism within the intestines of varying hosts, and can also acquire genes, resulting in disease. Biofilms require many genes to be created. Previous work in other organism's show that factors such as oxygen can be sensed to help regulate gene expression of cellular processes. Our hypothesis is that biofilm formation within a host may utilize genes to sense oxygen levels and control biofilm creation accordingly. A library of *E. coli* mutants is being analyzed for biofilm levels under varying oxygen levels and compared to wild type cells under the same conditions. Identification of the regulators involved in biofilm formation in response to oxygen allows for a better understanding of the mechanisms for *E. coli* colonization and survival.

HENRY HALL ATRIUM 095

PP2A Regulation in Planarian

Participants attending 1:00 PM - 2:00 PM

Presenter: Callie Rich

Mentor: Dawn Hart

In humans, it is understood that the regeneration of neuronal cells doesn't occur. Therefore, when studying neuronal regeneration, we turn to planarians, an organism that efficiently regenerates all body parts, to identify genes involved in this process. PP2A phosphatase is known to function in cell growth and differentiation; therefore, we specifically knocked-down PP2A using RNA interference (RNAi) then amputate the head to identify a role for PP2A in neuronal regeneration. To measure the effects of the knockdown, we compared planarian regrowth by measuring the blastema generated in PP2A knockdown samples compared to positive and negative controls. A Student T-test was performed to assess the differences in growth between the data sets. We calculated a p-value of 0.193, meaning that differences in growth for our knocked down planarians was not significant. We hope future studies will identify genes that function in brain regeneration and apply the findings to brain cells in humans.

HENRY HALL ATRIUM 096

Use of Gendered Intensifiers within the TV Show *Charmed*

Participants attending 4:00 PM - 5:00 PM

Presenters: Alanna Campbell, Sandra Price

Mentor: Kathryn Remlinger

On *Charmed*, a TV show starring three powerful witches who are also sisters, there is a gendered use of language as perpetuated by society standards, specifically with the use of intensifiers. Though contradictory to their power on the show, the women often use a linguistic set of intensifiers such as, *so*, *really*, *super*, *very*, etc. in order to describe the challenges they face as well as critiquing the social differences in the lives of each other, reflecting stereotypes about the way women speak. We will be using difference theory to illustrate how the men on the show are considered secondary characters but still hold the power in conversations. In addition, we will be using dominance theory to examine if there is a linguistic difference between the sisters, as the power dynamic on the show is not equal. Specifically, we will be looking at episodes in multiple seasons to reflect the power dynamic changes throughout the show to potentially further support our preliminary analysis.

HENRY HALL ATRIUM 097

Testing the Role of an Uncharacterized Gene in *Candida albicans* Filamentation

Participants attending 12:00 PM - 1:00 PM

Presenter: Eric Vaitkevicius

Mentor: Ian Cleary

The fungus *Candida albicans* is in most human intestines and mucous membranes, and it typically does not cause disease in healthy individuals. However, with changes in the host, such as in immune compromised individuals, disease can arise due to *C. albicans* ability to change cellular shape between round yeast and elongated filaments. In *C. albicans* cellular shape is regulated by a genetic program. The function of many genes associated with filamentation is unknown. Our goal is to understand the particular contribution to this process of one gene, *FGR16*. *FGR16* overexpression caused increased biofilm growth in some media, and increased clumping in some broth cultures. Changes in plate growth included reduced filamentous growth, as well as increased invasion. These results confirm that *FGR16* overexpression affects cell shape. We are testing how well this gene's function is maintained between organisms; by overexpressing homologs in *C. albicans* and looking for effects on cell shape.

HENRY HALL ATRIUM 098

New Media Representations of US Immigrants: An Examination of Immigration in Memes

Participants attending 3:00 PM - 4:00 PM

Presenters: Joseph Groszkiewicz, Megan LaPlatt, Evan Sturgeon, Carly Vaitkevicius

Mentor: Kathryn Remlinger

This project analyzes the relationship between immigration and language used about immigrants by observing Twitter memes. Utilizing a language ideology approach, we study the patterns of retweets a meme receives and the commentary it generates. We apply methods of discourse analysis to examine how the language of the meme and its comments reinforce linguistic stereotypes about immigrants. Preliminary findings indicate that Twitter users often engage in potentially damaging conversations toward immigration that are facilitated by memes. These findings reflect the patterns of microaggression that emerge during and after a major immigration boom.

HENRY HALL ATRIUM 099

Phylogenetic Analysis of *Palisota* (Commelinaceae) Using Chloroplast and Nuclear Regions

Participants attending 3:00 PM - 4:00 PM

Presenter: Alexandra Crum

Mentor: Timothy Evans

The plant genus *Palisota* (family Commelinaceae) consists of about 26 species. The genus, which differs from other Commelinaceae genera in stamen and pollen characters, a fleshy berry-type fruit, and anatomical characters, has been divided into two sections based on uniseriate vs. biseriate seed arrangement. Molecular phylogenetic analyses in Commelinaceae placed *Palisota* near the base of the family, although its precise position is unclear. Chloroplast (*matK*, *rbcL*, *rps16*, and *trnL-trnF*, *psbI-psbK*, *atpB-rbcL*, *atpF-atpH* and *psbA-trnH* intergenic spacers) and nuclear (AT103) regions in 21 accessions representing 15 *Palisota* species and 15 outgroup species were sequenced and analyzed using maximum likelihood and Bayesian methods, with the goal of resolving *Palisota*'s placement within Commelinaceae and relationships among species. The sectional classification is not supported, and results will be discussed in the context of sectional classifications, fruit color and seed arrangement.

HENRY HALL ATRIUM 100

Non-normative Spaces and the 'Freaks' that Reside Within

Participants attending 11:00 AM - 12:00 PM

Presenter: Samantha Brouwer

Mentors: Julia Mason, Leifa Mayers

The focus of this research project is to look at those with physical disabilities who were a part of these shows as the 'freaks' and the 'oddities' and how they created space for themselves to exist within a set of strict societal and cultural norms. The methodology that I will use for this research project is textual analysis by looking at promotional posters, portraits, letters, and photographs of performers that were part of Barnum and Bailey's circus between 1870 and 1900. In order to examine how disability in freak shows are represented, exploited, and used to create non-normative spaces, I am going to analyze archival materials from a few archives including the Circus World Museum and the New York Public Library that represent the American freak show between the 1870s and the 1930s, as this was the generally agreed upon peak of this cultural phenomenon. By looking at this social space, I will gain a better understanding of how this social space functioned.

HENRY HALL ATRIUM 101

Altering College of Health Professions' Undergraduate Curriculum: Incorporating American Sign Language

Participants attending 2:00 PM - 3:00 PM

Presenter: Jessica Parzynski

Mentor: Wil Rankinen

This poster demonstrates the importance of including American Sign Language (ASL) into the Grand Valley State University (GVSU) College of Health Professions' undergraduate curriculum. Exposing students to ASL in the classroom is beneficial to students, the health professions, and the community. Several universities found ASL strengthened their liberal education and fostered an inclusive environment for their community. Previous research supports the inclusion of ASL as a foreign language credit and curriculum requirement. Faculty interviews from the College of Health Professions provide insight on ASL as a previous major at GVSU, circumstances of it being discontinued, and the potential of reincorporating it into future curricula. By adding ASL classes as a certificate, minor, or major requirement, the College of Health Professions would facilitate further compliance with GVSU's policies and objective goal statements laid out in the strategic plan.

HENRY HALL ATRIUM 102

Calcification of the Thyroid Gland

Participants attending 9:00 AM - 10:00 AM

Presenter: Hannah Vermeer

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

The normal adult thyroid is a small, bilobed endocrine gland located in the anterior neck. This gland is responsible for the production of thyroxine (T4) and triiodothyronine (T3), two hormones important in metabolic regulation. Dissection of a 99 year old female cadaver revealed a calcification of one lobe of the thyroid gland. Calcification of the thyroid occurs when calcium deposits accumulate in the gland, and may be the result of either benign or malignant thyroid disease. The following study will describe calcification of the thyroid gland and discuss the significance and possible implications of this abnormality.

HENRY HALL ATRIUM 103

Changes in Behavior of Amur Tigers (*Panthera tigris altaica*) Following Introduction to a New Enclosure at John Ball Zoo

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

Presenter: Kylie Galla

Mentor: Jodee Hunt

Zoo animals alter their behavior in response to environmental changes. These may include introduction of new individuals to a social group, or changes in husbandry or enclosure features. Zoo animals may also move between zoos, thereby introducing them to a new location or social group. Two male, juvenile, sibling Amur tigers were transferred to John Ball Zoo and introduced to a 920 m² outdoor enclosure. We quantified spatially explicit behaviors over a 6-week period following introduction to explore how enclosure use changed over time. We quantified behavior in 30-minute bouts of all-occurrences interval sampling, alternating AM and PM observation sessions. Animals exhibited restricted spatial use initially, but increased diversity of behaviors and spatial use of the enclosure over time. In addition, the two individuals differed in their use of space and patterns of behavior. Both

tigers expressed particular behaviors, e.g., sleeping or pacing, in specific locations.

HENRY HALL ATRIUM 104

Effects of Arginine on Muscular Endurance

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

Presenters: Devon Gildea, Matthew Lautner, Kyryl Prisichenko, Austin Willey

Mentor: Ross Sherman

Background: In previous research, L-arginine has been suggested to be a vasodilator allowing more oxygenated blood to flow to the muscles and thus increased muscular endurance. Purpose: The aim of this study is to determine the effects of L-arginine on muscular endurance. Methods: Eight Healthy, college-aged students completed two supplementations (4 g L-arginine and placebo) trials using a randomized, cross-over design. Prior to testing, participants completed three familiarization trials that were used for baseline values. Each supplement was consumed at least 35 min before testing. Muscular endurance was then assessed using a push-up test, curl-up test, and floor press test, with five-minute rest between each test. Each trial was separated by at least two and no more than seven days. Results: Data will be presented at Student Scholar's Day.

HENRY HALL ATRIUM 105

Farm to Lake: Quantitative Analysis of Antibiotics, and Metagenomic Characterization of Microflora in Surface Waters in Livestock Farm Areas Contiguous to Lake Michigan.

Participants attending 1:00 PM - 2:00 PM

Presenter: Ethan Wright

Mentor: Babasola Fateye

Microorganisms that are continuously exposed to low concentrations of antibiotics, in large part due to livestock farms, show increased risk of microbial resistance. Microbes subjected to an environment that is constantly exposed to low concentrations of antibiotics can either adapt or die. The adaptation confers resistance to succeeding generations of microbes, thus increasing the prevalence of resistant genes in microbes. We hypothesize that the concentration of antibiotics in water samples will not be correlated with antibiotic resistance genes within microbes exposed in these waters.

HENRY HALL ATRIUM 106

Continuation of an Analysis of Polycyclic Aromatic Hydrocarbons (PAHs) following a Tar Sands Oil Spill in the Kalamazoo River

Participants attending 2:00 PM - 3:00 PM

Presenter: Nicholas Actis

Mentor: Tara Kneeshaw

In July of 2010 pipeline 6B owned by Enbridge Energy Partners ruptured causing roughly 1 million gallons of diluted bitumen (a heavier tar-like oil) to spill into the Kalamazoo River near Ceresco, MI. This type of oil is very thick and is capable of adhering to sediment to the point where dredging is the only mean of removal. This type of oil is heavily saturated with polycyclic aromatic hydrocarbons (PAHs) which constitute 50% of its molecular make up and are known to be carcinogenic. To transport this oil, it must be diluted with bio-solvents and even more PAHs. In this follow up study, we used microcosms consisting of the contaminated sediments and native water to evaluate how the concentration of the PAHs degrade over time. Following a 4 year incubation period, water and sediment

were analyzed for PAH compounds. The results were compared to those obtained upon sample construction and changes were evaluated.

HENRY HALL ATRIUM 107

Cardiovascular Response to Post-Exercise Cold Water Intake

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

Presenters: Kaylee Dando, Daniel Farias, Amanda Jones, Shannon Maloney

Mentor: Ross Sherman

Background: Previous studies suggest that post exercise cold water intake improves heart rate recovery. Purpose: The objective is to measure the effect of post exercise cold water intake on the cardiovascular system's response after aerobic exercise. Methods: Six healthy participants were recruited. Physiological data of HR, HR variability (HRV), BP, blood lactate, and urine hydration were recorded pre-exercise. Euhydrated participants exercised for 20 minutes at 80% HR reserve (HRR) on an elliptical after setting their desired incline and resistance. Participant HR was monitored during exercise to assess adherence to HRR. Within 30 seconds post exercise, experimental group consumed 7.5 mL•kg⁻¹H₂O, while the control group ingested no fluid. Physiological data were recollected, with HR, HRV and BP recorded 1, 5, 10, 20, 30, 40, 50, and 60 minutes post-exercise. Results: Will be presented at SSD.

HENRY HALL ATRIUM 108

PLK1 Effects on Regeneration in Planarian

Participants attending 2:00 PM - 3:00 PM

Presenters: Delaney Hart, Lauren Proctor

Mentor: Dawn Hart

The key question being researched in this project is how blocking a gene believed to be important in regenerating the central nervous system will affect the planarian, an organism able to regenerate its entire body. Polo kinase (PLK1) is a well characterized cell division protein. However, a specific cell division function for PLK1 in regeneration of the central nervous system remains to be shown. Therefore, we employed RNAi to knockdown PLK1 function; the ingested dsRNA could then produce a phenotype in the animals or stunt their growth, both of those outcomes are documented and quantified. The result of our research shows the PLK1 gene slowed down regeneration in planarian, compared to the regeneration of the negative control group. This research is crucial because it helps determine how the PLK1 gene can affect regeneration of the central nervous system in planarian, providing insight as to how the PLK1 gene could affect brain regeneration in other organisms.

HENRY HALL ATRIUM 109

Nurse Care Manager Impact on Type 2 Diabetes Mellitus at a Rural Primary Care Practice

Participants attending 11:00 AM - 12:00 PM

Presenter: Patrick Joswick

Mentors: Cynthia Coviak, Marie VanderKooi

Type 2 Diabetes Mellitus is a common diagnosis managed in the primary care setting. Patients with an uncontrolled state of the condition are most vulnerable to develop complications from the disease. Type 2 Diabetes can lead to devastating vascular-related comorbidities, remaining the leading cause of end stage renal disease and nontraumatic limb amputations. In addition, type 2 diabetes and its consequences are considered manageable

and preventable, catalyzing policies and measures such as Healthcare Effectiveness Data and Information Set as referred to as HEDIS quality measures to provide patients and providers objective data to address. Research on the management of type 2 diabetes in the primary care setting supports use of multifactorial interventions spearheaded by nurse care managers that address multiple risk factors are generally most successful at obtaining and adhering to the highest standard level of quality measures.

HENRY HALL ATRIUM 110

Do GVSU Students Trust the Media?

Participants attending 9:00 AM - 10:00 AM

Presenter: Allison Donahue

Mentor: Hsiao-ping Chen

The purpose of this class project is to understand GVSU students' perception and trust in the news media. The data was collected through a survey distributed to students through social media and student emails. The findings show that more students tune into the news on a daily basis than those that do not and social media has a large role in providing access to news sources. In correlation, students who access news more frequently have a greater trust in the media. The survey questions include medium that students use to access their news, the frequency of news consumption, the general perception of trustworthiness in journalists, and how their trust in media affects their trust in the government.

HENRY HALL ATRIUM 111

Building a Scanning Tunneling Microscope

Participants attending 12:00 PM - 1:00 PM

Presenter: Randy Lindgren

Mentor: Joshua Veazey

Physics gets weird at nanoscale. One peculiar process at this level is called quantum tunneling, which can be measured using a device called a scanning tunneling microscope. Over the course of the last two semesters, I have built an accessible and low-cost scanning tunneling microscope. This device will allow students to image materials with angstrom precision, view electronic properties at nanoscale, compare experimental data with theoretical calculations from our textbooks as well as provide us with yet another tool to further explore the world of physics.

HENRY HALL ATRIUM 112

Impact of PLK1 on Stem Cell Differentiation and Head Tissue Regrowth

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

Presenters: Mackenzie Hall, Amanda Moy

Mentor: Dawn Hart

Schmidtea mediterranea planaria possess the ability to regenerate any part of their body as long as they have at least 1/279th of the body present. Their stem cells have the ability to become any organ, including the brain. This study looked to see if a polo kinase (PLK1) affected the ability of stem cells to regenerate the amputated head region. Previous research has shown that overactivation of PLK1 caused cancerous growth; we hypothesized that inactivation of PLK1 through RNAi would cause a decrease in stem cell differentiation and tissue regrowth. After PLK1 inactivation, the planaria's heads were amputated. Regrowth of the head was compared in worms with activated and inactivated PLK1. Overall, there was no significant difference in head regrowth between the two

groups. However, eye spots were more prominent in the PLK1 RNAi animals. While the regrowth of the head region showed no difference, PLK1 may still play a role in faster differentiation of the central nervous system.

KIRKHOF CENTER GRR 001

Age-Related Patterns of Reproductive Success in Tree Swallows

Participants attending 10:00 AM - 11:00 AM

Presenters: Collin Fox, Alexis Godfrey

Mentor: Michael Lombardo

Understanding patterns of age-related reproductive performance is key to understanding the evolution of reproductive strategies. Reproductive performance typically improves with age and has been best studied in birds. We set out to determine if breeding female age class affected reproductive performance in Tree Swallows by analyzing data collected from second year (SY) and after second year (ASY) females breeding in nest boxes on the GVSU campus between 1992-2018. There was a significant increase in nest box occupancy that was punctuated by 5 years with high brood mortality due to predation. ASY females were more successful at hatching eggs and rearing nestlings. For both SY and ASY females, the proportion of eggs that hatched and nestlings that were successfully reared to fledging did not change significantly from 1992-2018. These results are consistent with other studies that demonstrated improved reproductive performance with age in birds.

KIRKHOF CENTER GRR 002

Heritability of Reproductive and Morphological Traits in Female Tree Swallows

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

Presenter: Emma Sachteleben

Mentor: Michael Lombardo

Heritability examines the influence of genes on the expression of traits. Estimating heritability helps identify the effects of genes on traits within a population. I examined the heritability of reproductive and morphological traits of female Tree Swallows nesting on the GVSU campus from 1995-2018. I estimated heritability by comparing the traits of mothers and their daughters. There was low heritability for reproductive traits such as first egg date, clutch size, the number of eggs hatched, and the number of nestlings that left the nest. In contrast, heritability was higher for morphological traits including right tail fork length, mass, holes chewed by lice, and especially head-bill and right wing length. These results show that environmental variation had a larger effect than maternal genes on the expression of reproductive traits and most morphological traits in this population of Tree Swallows.

KIRKHOF CENTER GRR 003

Blocking Electrochemical Collisions of Single Bacteria: Dependence of Current Transient Shapes on Species and Supporting Electrolyte Concentration

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

Presenter: Sabrina Jenkins

Mentor: Scott Thorgaard

In this report, we advance the understanding of electrochemical blocking collisions to unstudied bacteria in order to understand how cell composition influences current transients. Interferences in the steady state oxidative current were observed as bacteria cells collide with a 10 μm platinum ultramicroelectrode (UME). Adsorption of bacteria inhibits ferrocene methanol to diffuse to the electrode. This blocking effect is observed as a decay in current that

is characterized by either blip or stepwise transients. By altering the concentration of the supporting electrolyte, a dependence of the frequency of collisions and transient characteristics were observed. Results support that at low concentrations (100 μ M KCl), blip transients were more abundant. However, when at a high concentration (5.0 mM KCl), blip transients were no longer observed. This effect seems to be selective for specific bacteria and the governing mechanism is being investigated using fluorescence microscopy.

KIRKHOF CENTER GRR 004

Effects of Cul-3 on Planarian Regeneration

Participants attending 1:00 PM - 2:00 PM

Presenter: Violet Ruiz

Mentor: Matthew Christians

There are many genes responsible for planarian regeneration and we do not know how they all affect regeneration. Cul-3 is associated with ubiquitination and degradation of select proteins, however, it is not known how Cul-3 might affect regeneration. We treated planaria with RNAi to knockdown Cul-3 and then amputating the head from the body, we viewed regeneration of the head. This research did not identify a statistical difference between Cul-3 and the control for regeneration, but there were slight behavioral changes where certain worms would swim in circles or flip their heads backwards, which should be further investigated. Further analysis of the Cul-3 gene may identify how it influences planarian behaviorally, which could help us better understand the regeneration of neurons and how to apply it towards treating neurodegenerative diseases.

KIRKHOF CENTER GRR 005

A Literature Review on Salient Cues and Wayfinding

Participants attending 9:00 AM - 10:00 AM

Presenter: Kristen Kaled

Mentor: Rebecca Davis

Wayfinding refers to one's ability to navigate through an environment. Wayfinding is impaired with age and cognitive diseases. Many older adults who have cognitive problems live in long term care communities, which are difficult for wayfinding. Physical cues such as signs, and landmarks can be used as aids in wayfinding. The more 'salient' the cue the more distinctive and helpful it is for wayfinding. The present literature review was conducted to determine the qualities of cues that make them salient for wayfinding. Findings of 14 reviewed studies between the years of 2016 - 2018 showed that color, proper lighting, size and familiarity of the object are qualities that add to the cues' salience for wayfinding. The information from this literature review can be used to determine the kinds of cues that should be used to help older persons find their way in complex built environments.

KIRKHOF CENTER GRR 006

The Effect of Different Pre-exercise Treatments on Power Output

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: Liam Hart, Jessica Montalbano, Anthony Warner, Steven Zanders

Mentor: Stephen Glass

Modern warm up techniques attempt to prepare the muscles for performance by increasing activation sensitivity and flexibility, or reducing stiffness. The purpose of this proposed study design is to examine the effects of

three pre-exercise muscle treatments on peak power output. The study examines muscle activation through electromyography of the gastrocnemius and the quadriceps muscles, as well as power output measured with an accelerometer. Three treatments (static stretching, foam rolling, vibrating foam rolling) will be used prior to completing a maximal power test (vertical jump). Past studies suggest a negative impact of static stretching on power output due to reduced activation potential, while foam rolling is used to create a myofascial release, increasing elasticity. The effects of vibrating rolling on power output is unknown, and we will be testing a recently marketed device. Through this study, we hope to determine the best pre-exercise treatment to improve power output.

KIRKHOF CENTER GRR 007

The Effects of Cadence Manipulation on Running Economy

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

Presenters: Olivia Giammalva, Kailey Schoen, Brandon VanOosten

Mentor: Kyle Barnes

Optimal running cadence is a controversial topic within the endurance running research field. The purpose of this study was to observe the effects of manipulating running cadence on running economy. Initially, subjects ran for 2 minutes to find a speed equal to a rate of perceived exertion (RPE) of ~14. Participants performed a 5 minute running session at that self-selected speed to determine baseline cadence and foot strike pattern using high speed video analysis. Participants performed two more running sessions in a randomized order. One session increased the running cadence by 8% and the other decreased it by 8%. There was a 5 minute rest period between sessions. Expired gases were measured continuously using a metabolic cart. Heart rate, foot strike pattern, and RPE were measured throughout each 5 minute running interval. Data collection is currently ongoing and the results will be presented at Student Scholar's Day.

KIRKHOF CENTER GRR 008

Attributions for Prosocial Motivation

Participants attending 2:00 PM - 3:00 PM

Presenter: Jasmine Bechtel

Mentor: Luke Galen

Individuals can attribute their prosocial behavior to a range of sources such as internal states (intuitions, positive emotions), self-interest, religion, and traits present at birth. In the present study, individuals performed hypothetical prosocial tasks (e.g., likelihood of engaging in prosocial activities, allocating lottery winnings to others, economic decisions involving partners) and made attributions for the origin of their prosociality. Overall prosociality was attributed to greater internal state motivation and religious motivation and lower self-interested motivation. Generosity was specifically attributed to internal state motivation whereas sharing lottery winnings with others related to attributed religious motivation. Contrary to prevalent social stereotypes, religiosity was only inconsistently related to overall prosociality.

KIRKHOF CENTER GRR 009

Help! It's Due in Two Hours: Point-of-need Research Services from a Student's Perspective

Participants attending 12:00 PM - 1:00 PM

Presenter: Maureen Wood

Mentor: Erica Millspaugh

Despite the important role that research plays in higher education, learning research skills is not always a well emphasized goal within individual college courses. To that end, there are many college students who struggle to understand how to do research. The library plays a critical role in connecting students with resources that will help them be academically successful, but at Grand Valley there is no mandatory library research orientation or course. Because of this, some students are missing vital research instruction that would be beneficial when working on assignments. By creating an online library guide to function as a starting point for learning these skills students will have a new point-of-need resource. This will help them be successful both at the last minute, and/or to plan ahead for future assignments.

KIRKHOF CENTER GRR 010

Mind the Gap: Intergenerational Loss of Traditional Ecological Knowledge (TEK) among Kenyan Maasai

Participants attending 12:00 PM - 1:00 PM

Presenter: Roberto Carriedo Ostos

Mentor: Kristin Hedges

An accumulation of evidence suggests that traditional medicinal knowledge (TMK) among indigenous populations is at risk of being lost. This project, with its focus on urban Maasai seeks to tease out the underlying influences responsible for the intergenerational loss of TMK among Maasai. Data from the 2017 Olosho Ethnobotany Project found that Maasai elders believed the younger generation did not want to use traditional medicine. Methods used was a combination of participant observation and in-depth interviews of 10 participants. Results from current fieldwork found a number of sociocultural factors contributing to the loss of TMK among younger generations. The surprising finding was while younger generations were amenable to learning and described a strong desire to learn, elder Maasai were not forthright with their teaching of TMK. We have concluded to support TMK methods of transmission must be adapted to suit the new urban and modern lifestyles of new generations.

KIRKHOF CENTER GRR 011

Visual Cue Learning in Crayfish

Participants attending 12:00 PM - 1:00 PM

Presenters: Alta Gillham, Laura Miller, Nathan Stuart

Mentor: Daniel Bergman

Crayfish have simple and well-studied nervous systems, yet there has been limited insight into complex learning processes used when interacting with their environment. This study used classical conditioning to analyze the learning capabilities of the crayfish species *Faxonius propinquus*. A visual stimulus, different colored LEDs, were paired with a food reward whenever the "learning" crayfish entered a reward zone. Crayfish were trained for a period of six days to potentially learn an association between a LED and a food reward. On day 7, crayfish were evaluated as to their attractiveness to a conditioned LED stimulus. The amount of time spent near the LED stimulus was then quantified. The study used blue and orange LEDs, which were selected for their opposite positions on the crayfish visual spectrum. The presence of a statistically significant difference between controls and trained crayfish would demonstrate that crayfish are capable of visual learning using LEDs.

KIRKHOF CENTER GRR 012

Demographic Study of Walker City, Michigan

Participants attending 12:00 PM - 1:00 PM

Presenters: Bryce Bennett, Kyle Henegar

Mentor: Mark Hoffman

visual community profile of the demographic, social, and economic characteristics of Walker, Michigan, obtained from the American Community Survey.

KIRKHOF CENTER GRR 013

Community Analysis of Oak Park, IL

Participants attending 9:00 AM - 10:00 AM

Presenters: Emily Dawson, Jessica Johnson

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Oak Park, IL, obtained from the American Community Survey.

KIRKHOF CENTER GRR 014

Traverse City Community Analysis

Participants attending 11:00 AM - 12:00 PM

Presenters: Corrie Cotugno, Megan Timmer

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Traverse City, Michigan, obtained from the American Community Survey.

KIRKHOF CENTER GRR 015

Grand Haven Tourism

Participants attending 10:00 AM - 11:00 AM

Presenters: Natalia Blanco, Brookelyn Nichols, Tarah Young

Mentor: Mark Hoffman

A visual community profile of the recreation and tourism industry in Grand Haven Michigan, obtained, in part, from the American Community Survey.

KIRKHOF CENTER GRR 016

Informed Consent: Research with the Cognitively Impaired

Participants attending 9:00 AM - 10:00 AM

Presenter: Lucille Yurko

Mentor: Rebecca Davis

Informed Consent is a necessary part of research according to the Office of Human Research Protections (SACHRP, 2009). There are criteria for explaining and obtaining consent from participants. Informed Consent has four parts: capability to make a decision, capability to comprehend information, capability to understand how

circumstances affect them, capability to understand new information. The purpose of this project was to determine how ethical research can be done when it involves cognitively impaired individuals. To accomplish these goals a systematic review was done examining articles from 1998 through 2017. Three search terms were used, including: *research*, *informed consent*, and *dementia* in 3 databases: Cinahl, Trip, and PubMed. In total, 33 articles were reviewed. The results showed that no protocol currently exists for research participants with dementia. Some guidance was suggested in the literature, but further evidence to develop a consent protocol must be developed.

KIRKHOF CENTER GRR 017

Community Analysis of the City of Ionia

Participants attending 3:00 PM - 4:00 PM

Presenters: Haley Braun, Ricardo Gonzalez, Jade Starr

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Ionia, Michigan, obtained from the American Community Survey.

KIRKHOF CENTER GRR 018

The Effects of Silencing *cdh1* Using RNAi on Planarian Regeneration

Participants attending 9:00 AM - 10:00 AM

Presenter: Louis Walter

Mentor: Matthew Christians

Regeneration is an important field of study in modern medicine and is governed by many biological processes and genes. The effects of each gene on the extraordinary regenerative abilities of planarians is not well documented and forms an important basis for future research on this organism. The gene *cdh1* has a very long list of potential biological functions such as mediating neuron differentiation, or regulating the anaphase stage of the cell cycle; *cdh1* is heavily implicated in planarian regeneration, but the exact effects on planarian regeneration is not well understood. We have used RNAi to silence *cdh1* and measure the effects of this silencing on regeneration by measuring the new growth post-amputation. Quantitatively, *cdh1* had no effect on blastemal size and qualitatively caused disorientation, lethargy and a modified head-shape. *Cdh1* may play a role in regeneration based on the observable differences in worm behavior which has important implications for regenerative medicine.

KIRKHOF CENTER GRR 019

How Different Forms of Stretching Affect Sprint Time and Joint Angle

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

Presenters: Ashley Buskard, Hailey Hepfner, Hannah Knight, Tyler Rush

Mentor: Kyle Barnes

Previous research shows static stretching can improve ROM, but dynamic improves performance. The purpose of this study was to investigate how static and dynamic stretching affect the time it takes for a healthy college aged students to run 60m, and how the types of stretching affect the joint angle of the knee. Utilizing a randomized-crossover design, ~12 students were assigned to either no stretching (control), static stretching, or dynamic stretching on different days separated by at least 48 hr. Each of the experimental groups performed 10 x 1 min protocol of either stationary or active stretches, focusing on the lower body with some upper body incorporated. At the indoor track, laser timers marked the start and finish lines; runners took off from a standing start. At

approximately the 30m point, investigators utilized DartFish Express, to assess joint angle at the knee. Data collection is currently on going, results will be presented at SSD.

KIRKHOF CENTER GRR 020

Effects of Various Exercise Intensities on Memory Function

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

Presenters: Melissa Barton, Camelia Meindertsma, Kara Mott, Kayla Wols

Mentor: Kyle Barnes

Introduction: Previous research has shown that exercise increases memory function in older populations with exercise. The purpose of this study was to investigate the effects of various exercise intensities on cognitive memory function in college age students. We hypothesized word recall to increase with increasing exercise intensity. Methods: Memory function was assessed using a 15 word recall test prior to and after exercise in 10 college age individuals. After 10 minutes of either rest, low-intensity sustained state (LISS) exercise, or high-intensity interval training (HIIT) exercise, the memory recall test was administered with a different set of words. The intensities were set using ranges on the Borg scale for rate of perceived exertion. The LISS exercise intensity was set at 11 RPE and HIIT exercise intensity was set at 15 RPE. Testing days were separated by 48 hours. Results: Data collection is currently ongoing and results will be presented at SSD.

KIRKHOF CENTER GRR 021

Textural Analysis of Keweenaw Rhyolites Relating to the Formation and Structure of the Midcontinent Rift

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

Presenter: Eric Schuemann

Mentor: Ginny Peterson

The Midcontinent Rift (MCR), exposed around Lake Superior, represents a 1.1 Ga failed continental rift system which experienced ~30 million years of volcanism and depositional infill. While dominated by mafic rocks, physically distinct rhyolites make up ~10% of the rift products and contain native copper. Flow textures and other characteristics in these rhyolites, which have not been as thoroughly studied as the mafic rocks, are indicators of magma evolution and eruptive environments during rifting. Rhyolite and rhyolite-bearing conglomerates collected in the Keweenaw represent the Portage Lake (Fish Cove) and Porcupine Mountain (White Pine) volcanic sequences. Microscopic textural analysis of collected samples may indicate characteristics unique to copper-bearing conglomerates. Currently, similar textures in older Fish Cove rhyolites indicate that they are a possible source for the rhyolite clasts in the conglomerates, while the younger White Pine textures are not.

KIRKHOF CENTER GRR 022

One Mile To Go: Training for and Blogging About a 10k Road Race

Participants attending 9:00 AM - 10:00 AM

Presenter: Jillian Green

Mentor: Theodore Towse

Today Americans are participating in less physical activity than previous generations. Working in an office, school, and commuting can cause one to lead a relatively sedentary lifestyle. Growing research supports that leading a sedentary lifestyle plays a part in the development of health problems like obesity, cardiovascular disease, and

diabetes. As a soon-to-be graduate from Grand Valley State University, I wanted to learn how to make exercise a habit and learn how to develop a training program. As my Honor's Senior Project, I decided to learn about diverse topics in running, create and carry out a training program, and blog about it. My blog post includes posts about the history of running, how to make a habit of running, and ways to prevent plateaus in my training. The blog also discusses my personal experiences while training for a 10k race that will take place in late March.

KIRKHOF CENTER GRR 023

Black Women's Representation in Popular U.S. Magazines

Participants attending 4:00 PM - 5:00 PM

Presenter: Halie Hampton

Mentor: Julia Mason

Women's magazines in the U.S. have set the standard for how beauty is defined through both images and carefully chosen language. Black women are often missing from popular magazines and when included, the portrayal is negative reinforcing false perceptions and stereotypes. This project is a feminist textual and visual analysis of popular magazine Summer 2018 issues of *Cosmopolitan*, *Ebony*, *Harper's*, *Bazaar*, *Glamour* & *Vanity Fair*. The examination of how language and images shape the ways that Black women are portrayed in magazines illustrates how this flawed representation can not only affect self-esteem, but can cause Black women to view themselves in a negative way. This ongoing pattern of erasure affects the wide audience of magazine readers because it creates and reinforces unconscious stereotypes.

KIRKHOF CENTER GRR 024

Accessibility of Diabetes Education in West Michigan

Participants attending 9:00 AM - 10:00 AM

Presenter: Rachael Williams

Mentor: Kelli Damstra

The prevalence of diabetes in the United States is staggering. According to the Center for Disease Control (CDC), it is estimated that around 30.3 million people in the U.S. have diabetes. This makes up for 9.4 percent of the population. In Michigan, it is estimated that around 10.4% of the population have diabetes, putting Michigan above the National average (MDHHS, 2015). With diabetes being widespread throughout the US, there is a focus in the health care field on patient adherence to treatment of diabetes. One aspect of diabetes care that has been identified to help increase adherence is the education aspect of treatment. However, for education to be effective it must be highly accessible to the individuals diagnosed with diabetes. Cost and location are two important factors when evaluating accessibility of diabetes education in West Michigan.

KIRKHOF CENTER GRR 025

An Efficient Method for Indexing Temporal Gene Expression Datasets

Participants attending 9:00 AM - 10:00 AM

Presenters: Shahryar Oliai, Casimir Tokarski

Mentor: Guenter Tusch

Comparative transcriptome analysis of high throughput gene expression temporal experiments helps with understanding of the complexities of living organisms with great value for diagnosis, treatment, and prevention of human diseases. To identify those temporal patterns, temporal studies need to be indexed appropriately since much

of the publicly available high throughput expression data is of non-temporal nature. The index needs to be based on the MIAME standard as used for example for abstracting NCBI's Gene Expression Omnibus (GEO) datasets. A simple keyword search of abstracts from NCBI GEO will only result in a large number of false positives. Using random samples of keyword search results, we repeatedly refined the search query to obtain better indexing of the datasets from temporal studies. The refined indexing algorithm can be used in future studies to compare patterns of gene expression in bioinformatics.

KIRKHOF CENTER GRR 026

The Effect of L-Arginine Supplementation on Muscular Endurance and other Physiological Measurements

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

Presenter: Bailey Reitsma

Mentor: Matthew Feedback

Purpose: To examine physiological markers related to assessing the efficacy of l-arginine supplementation on muscular endurance during a push-up test. Methods: Researchers will recruit twenty male subjects to participate. Subjects will visit the GVSU Human Performance Lab on four occasions. The first visit is to assess baseline health and fitness measures. The other three will be testing trials. Subjects will consume one of 3 drinks: lemonade, 2g l-arginine + lemonade, or 4g l-arginine + lemonade. Physiological markers will be assessed before, during and after a push-up test. A double-blind, crossover design is used to control for researcher bias. Expectations: It is anticipated that results will demonstrate l-arginine supplementation to have a positive effect on the physiological markers related to improving muscular endurance. Conclusion: Physiological markers examined will allow researchers to better assess the efficacy of l-arginine supplementation for muscular endurance activities.

KIRKHOF CENTER GRR 027

Climate Change Resilience and Flood Risk Management in the Benelux Region

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

Presenter: Leah Anderson

Mentor: Elena Lioubimtseva

This research identifies the risk of flooding due to climate change in the Benelux region and what mitigation and adaptation strategies are being put in place by urban settlements. Frequency and intensity of wet-weather events are likely to occur in the near-future due to climate change impacts. Faster stream flows from more frequent and intense rainfall increases the likelihood of flood risk which includes damage to critical infrastructure. Adaptation strategies, such as blue-green infrastructure, can reduce the risk of devastating flood events from climate change. Data will be collected using methods such as climate computer modeling, including MAGICC/SCENGEN, ArcGIS and remote sensing technology, scholarly articles, and contacts with scholars who are well-informed on the topic. The expected results will include what negative impacts the Benelux region are currently experiencing and what mitigation and adaptation strategies are being implemented in regards to flood-risk management.

KIRKHOF CENTER GRR 028

The Effect of Passive and Active Recovery Between Two Back-to-Back Wingate Tests on Peak Power and Lactate Levels

Participants attending 1:00 PM - 2:00 PM

Presenters: Katelyn Akhurst, Kathryn Ferris

Mentor: Kyle Barnes

Previous research has shown active and passive recovery periods have demonstrated different lactate removal rates and effects on subsequent anaerobic performance. The purpose of this study was to examine the differences between active and passive recovery between 2 modified Wingate tests on peak power and lactate levels. In a randomized crossover design spanning 2 days, participants performed 2 anaerobic 15-second Wingate performance tests with varying recovery types between each one. Both active and passive recovery lasted 8 minutes in duration. Active recovery was standardized to 60 rpm on a cycle ergometer with a resistance of .5 kg; passive recovery participants stood for 6 minutes and then pedaled at 60 rpm with .5 kg for 2 minutes. Peak power was assessed after each 15-second test while lactate levels were measured at baseline, 4 minutes post first test and 4 minutes after the second test. Data collection is ongoing and results will be presented at Student Scholars Day.

KIRKHOF CENTER GRR 029

Effects of Orf19.2302 on Growth Under Various Metal and pH Conditions in *Candida albicans*

Participants attending 11:00 AM - 12:00 PM

Presenter: Caiden Walter

Mentor: Ian Cleary

The gene *orf19.2302* is upregulated during filamentous growth in the fungi *Candida albicans*. This gene encodes a protein of unknown function and cellular localization. The protein is predicted to be a permease and may be a transporter of cations between the endoplasmic reticulum and the cytoplasm. To test it for cation transport we have examined the growth of a deletion strain in the presence of metal stressors. In the presence of the divalent cation chelator EDTA, deletion or over-expression of this gene had no effect. Growth on media containing iron or magnesium at neutral or acidic pH was also unaffected. However, growth in the presence of zinc or copper at acidic pH was altered. In acidic copper medium the deletion strain was more resistant to metal stress, whereas in acidic zinc medium an over-expression strain was more sensitive. These results suggest the protein is involved in metal ion transport in *C. albicans* and is required for stress responses in some growth conditions.

KIRKHOF CENTER GRR 030

Intellectual Wellness for College Students: Optimal Strategies to Improve Memory, Learning Success, and Overall Quality of Life

Participants attending 3:00 PM - 4:00 PM

Presenters: Kayla Johnson, Kaylee VanHalm

Mentor: Jenny Baweja

This project explores the intellectual domain of student wellness by defining a variety of strategies used for optimal learning outcomes. A team of interprofessional students researched topics including but not limited to, sleep habits, physical activity, academic factors, and external support systems. After examining the literature it was discovered that lecture length, working less than 20 hours, engaging in physical activity, and having a strong social support system will positively influence a student's intellectual wellness. Intellectual wellness can be impacted by many factors that college students experience on a daily basis. Having awareness of these factors, and implementing these skills can increase the efficiency shown throughout one's educational career.

KIRKHOF CENTER GRR 031

Olfactory Alarm Signaling in Crayfish

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

Presenters: Gregory Deemer, Gerald Robinson, Lindsey Short

Mentor: Daniel Bergman

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 is 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 negative response in other crayfish. Our study compared the behavioral responses of *Faxonius propinquus* crayfish using three odorants: a crushed conspecific crayfish, food and predator (*Trachemys* spp. turtle). We hypothesize that subjects will be repelled from the crushed conspecific crayfish and predator odors due to the presence of an alarm odor, whereas food odorants will be attractive.

KIRKHOF CENTER GRR 032

Implementation of a Depression Identification Toolkit for At Risk Patients Based on the Adverse Childhood Experience Questionnaire in an Adult Specialty Care Clinic

Participants attending 9:00 AM - 10:00 AM

Presenter: Brittany Taylor

Mentor: Dianne Slager

Adverse Childhood Experiences (ACEs) are negative physical, psychological, and emotional experiences or events that elicit a stress response during childhood. Research indicates a strong correlation between ACEs, the associated toxic stress, autoimmune disease, and adult depression. Assessment for depression through use of a standardized depression screening tool can assist in the identification of at-risk patients, as well as development and individualization of the patient treatment plan. This project focused on the implementation of a standardized depression identification toolkit, incorporating the Patient Health Questionnaire Nine-Item (PHQ-9) screening tool, for patients with history of ACEs within the specialty primary care setting. This toolkit included suggested individualized interventions based on patient characteristics, educational materials for patients, and detailed sustainability plan.

KIRKHOF CENTER GRR 033

Assessing Biofilm Growth of *Staphylococcus lugdunensis* Under Varying Concentrations of Metal Chelators

Participants attending 9:00 AM - 10:00 AM

Presenter: Jonathan Galea

Mentor: Kathryn Haley

Staphylococcus lugdunensis makes up part of the normal skin flora but has the capacity to shift to an invasive and aggressive pathogen. *S. lugdunensis* has the propensity for colonizing prosthetic surfaces including artificial heart valves leading to endocarditis. The process by which *S. lugdunensis* transitions from colonizing biological tissues to inorganic surfaces presumably involves the formation of a biofilm, a complex community of bacteria. The conditions that induce planktonic cells to initiate biofilm formation are poorly understood in *S. lugdunensis* however,

metal availability has recently been implicated as an important environmental signal inducing biofilm formation. Using different metal chelators, including the zinc chelator TPEN, we have begun to interrogate the role of metal availability on the initiation and establishment of *S. lugdunensis* biofilms. Modulating zinc accessibility represents a potential therapeutic approach for combating *S. lugdunensis* infection.

KIRKHOF CENTER GRR 034

Genetic Structure of White-Tailed Deer in Grand Haven, Michigan

Participants attending 12:00 PM - 1:00 PM

Presenter: Jordan Veldboom

Mentor: Georgette Sass

The overabundance of white-tailed deer (*Odocoileus virginiana*) in urban settings has contributed to many ecological issues in recent years. Since *Odocoileus virginiana* have been known to spread diseases (such as Chronic Wasting disease) and invasive species (such as Hemlock Woolly Adelgid), urban populations need to be managed. The goal of my project is to characterize the spatial genetic landscape of *Odocoileus virginiana* matriarchal groups in the urban green spaces of Grand Haven, MI, as well as determine whether the urban infrastructure has impacted the movement of individuals in this urban population. DNA isolated from the intestinal gut cells found in feces are used for genetic analysis. In total, ten microsatellite regions of the DNA will be amplified via PCR to genotype individual deer, mitochondrial DNA amplified and sequenced to determine maternal relationships, and zinc-finger repeats on the X and Y chromosomes analyzed on agarose gel to determine the sex of the individuals.

KIRKHOF CENTER GRR 035

A Meta-Analytic Review of the Effect of Physical Exercise on the Symptom Reduction of People with Alzheimer's Disease

Participants attending 10:00 AM - 11:00 AM

Presenters: Alaine Banninga, Michael Jones, Eric Kirkendall

Mentor: Francis Sylvester

Alzheimer's disease is a neurodegenerative disease frequently associated with reductions in mental cognition and other neurological functionality. Some researchers have hypothesized that by increasing the amount of physical activity performed by individuals with Alzheimer's disease, many of their associated symptoms will improve. Our goal is to gather other research that has been completed on this topic and compile it all into one comprehensive meta-analytic review; this will show a wholistic picture on whether physical activity increases mental cognition with Alzheimer's. This study utilizes the standard MMSE (Mini Mental State Exam) as a measuring tool to equally compare cognitive functionality from study to study. The research selected for this analysis uses an MMSE test before and after the exercise program was implemented.

KIRKHOF CENTER GRR 036

Discourse in the Magical World: A Contextual Analysis of *Harry Potter and the Deathly Hallows*

Participants attending 4:00 PM - 5:00 PM

Presenters: Brendon Butler, Sarah McLellan

Mentor: Kathryn Remlinger

The *Harry Potter* series is a defining set of books for millennials, and is credited with giving commentary on social issues ranging from racial tensions, to income inequality, to religious beliefs. However, *Harry Potter* tends to avoid discussing performative gender. We took a random sampling of the text in *Harry Potter and the Deathly Hallows*, the final novel in the series, to see how J. K. Rowling crafted her characters and their gender performances throughout the series. We argue that despite *Harry Potter* being radical on many social issues, gender performance and its portrayal remains rooted in ideologies that prescribe gender to be an innate identifier, that gender is a binary, and that there are essential aspects to being a man or a woman.

KIRKHOF CENTER GRR 037

Crushing Progress: A Discourse Analysis of *GVSU Crushes* and its Reinforcement of the Heterosexual Market and Essentialist Gender Binaries

Participants attending 4:00 PM - 5:00 PM

Presenters: Rhianna Bennie, Courtney VanHorn

Mentor: Kathryn Remlinger

The campus discourse surrounding intersections of gender and sexuality affects and reflects the social structure of Grand Valley State University. By looking at *GVSU Crushes*, an anonymous twitter page that posts submissions from GVSU students, we analyzed discourse submitted by our peers on campus about other members of the student community. In our preliminary analysis we found that much of the discourse focused on the heterosexual market and individuals seeking and prescribing to essentialist ideas of attractiveness that feed into the gender dichotomy. This essentialist practice equates beauty standards to sexual and romantic availability within this heterosexual market and reinforces gender and sexual binaries. Through discourse analysis, we will apply language gender ideology to look at how ideas of gender, sexuality, and availability intersect to form the overall discourse at GVSU.

KIRKHOF CENTER GRR 038

The Role of Structural Policies in Economic Development

Participants attending 1:00 PM - 2:00 PM

Presenter: Jordan Pattison

Mentor: Whitt Kilburn

Throughout the second half of the twentieth century, the global trade regime had largely focused on liberalizing trade and investment through integrating markets and lowering domestic trade protections. The IMF and World Bank have instituted these practices through multilateral trade agreements and coercive structural adjustment programs to poor and indebted states. These policies are based on the belief that free market capitalism and democracy are the basis for economic growth and prosperity, but for many developing states, these policies have been either unsuccessful or damaging. This system did not consider what domestic policies and institutions must first exist for a state to facilitate free market systems and obtain economic growth. This project evaluates the fundamental importance of structural policies as a key determinant of the ability to experience economic growth by examining how the rule of law, regulatory environment, and business environment shape economic outcomes.

KIRKHOF CENTER GRR 039

Bilateral Occurrence of Sternalis Muscle

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

Presenters: Hannah Atherton, Kristopher Bolcer, Sean Briggs, Mackenzie Brower

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

Dissection of the chest of an 89 year old female revealed a bilateral occurrence of the sternalis muscle, an anatomical variant of the anterior chest wall that is rare within the general population. Sternalis lies superficial to pectoralis major, with its fibers oriented perpendicular to the fibers of pectoralis major. This project shows the potential origin, insertion, and nervous innervations of the muscle, as well as its clinical significance. Even though the sternalis muscle is uncommon, its superficial location causes important clinical implications, such as the misdiagnosis of a tumor when it occurs unilaterally.

KIRKHOF CENTER GRR 040

The Association Between Dietary Niche Variation in Rodents and Climate Change Across the Paleocene-Eocene Thermal Maximum

Participants attending 10:00 AM - 11:00 AM

Presenter: Hannah Vermeer

Mentor: Laura Stroik

Mammalian teeth play a crucial role in food acquisition and breakdown and are therefore closely tied to dietary niche. This study reconstructed the diet of early Paleogene paramyid rodents across the Paleocene-Eocene Thermal Maximum climatic event in an effort to understand the role of climate in mammalian dietary niche change. Dietary niches were quantified using three dental topographic measures (Dirichlet normal energy, relief index, and orientation patch count rotated), and correlation analysis of these measures with climatic variables indicated that dietary niche change in these paramyid rodents was associated with climate change across the time period studied ($P < 0.05$). These results indicate the significance of climate change on the dietary niche of these rodents, with potentially broader implications for mammalian interactions such as competition for resources.

KIRKHOF CENTER GRR 041

Experimental Comparison between a 3D Model Foot and a Metal Plunger for Determining Energy Return in Running Shoes

Participants attending 12:00 PM - 1:00 PM

Presenters: Kevin Black, Christian Vollmers

Mentor: Wendy Reffeor

Working together with a Professor in the School of Engineering we are currently researching the validity of Nike's claim that their Vapor Fly shoe provide an additional 4% greater energy return when compared to competitors' shoes. The energy return of the shoe was tested in a hydraulic tensile tester, using a 3D printed foot for loading. Specific sections of the foot were used for loading to replicate differing running striking methods. The creation and manipulation of the 3D scanned, and modeled foot has been difficult to execute, a hypothesis that we wish to explore is whether the use of a custom machined metal plunger to decompress the shoe would provide identical results to those from testing the 3D modeled foot.[WR1] The effectiveness of the plunger will be determined through statistical analysis and comparison of the multiple data sets recorded from the two testing methods.

KIRKHOF CENTER GRR 042

Blogging Gender

Participants attending 4:00 PM - 5:00 PM

Presenters: Alex Baker, Sarah Belanger

Mentor: Kathryn Remlinger

This study examines the differences and similarities between the ways that transgender and cisgender women define and construct their gender online through the use of blogs. Using three posts from each blog, we will be performing semiotic and semantic analysis of the texts to see how these communities use language to construct their gendered experiences. Our initial findings show differences in how gender issues are structured between trans women and cis women, as well as differences in how the concept of “womanhood” is defined. These findings also demonstrate notable differences along socioeconomic and racial lines within each community.

KIRKHOF CENTER GRR 043

The Manifestation of Scrotal Elephantiasis in an 89 year old male

Participants attending 9:00 AM - 10:00 AM

Presenter: Issa El-Kildani

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

The dissection of the body of an 89-year-old male revealed an instance of scrotal elephantiasis. Scrotal elephantiasis is a disease that is caused by obstruction, aplasia, or hypoplasia of the lymphatic vessels draining the scrotum. It can either be congenital or acquired in nature, with infection being the most common acquired etiology. The most common infections leading to scrotal elephantiasis are lymphogranuloma venereum or filarial infestation, caused by the parasitic roundworm, *Wuchereria bancrofti*. The rare occurrence of these infections in Western nations makes scrotal elephantiasis an uncommon disease outside of Africa and Asia. Other causes of this disease include chronic inflammation, neoplasm, irradiation and lymph node dissection.

KIRKHOF CENTER GRR 044

The Temporal and Atmospheric context of Howling Behavior among Mantled Howler Monkeys (*Aloutta palliata*) at La Suerte Biological Field Station.

Participants attending 9:00 AM - 10:00 AM

Presenter: Emily Kosnik

Mentor: Kristin Hedges

Though howler monkeys (*Aloutta* spp) are widely studied, the function of their loud calls is a topic of much debate among primatologists. At La Suerte Biological Research Station in Costa Rica I examined the relationship between howling behavior and precipitation, and the relationship between howling behavior and time of day in mantled howler monkeys (*A. palliata*). I predicted that there would be a link between precipitation and an increase in howling behavior, and that most howling behavior would occur in the early mornings. In January 2019 I conducted 27 hours of all-occurrences sampling of howling behavior. Howling was not related to rain, but did occur most frequently in the early mornings. Based on the timing of samples when howling behavior occurred and the frequency of howls within the samples, my findings support the theory that howler monkey howls have different meanings at different times, but that they serve primarily as mechanisms of intergroup spacing.

KIRKHOF CENTER GRR 045

Hydraulic Traits in Epiphytic *Elaphoglossum* Ferns from Puerto Rico

Participants attending 9:00 AM - 10:00 AM

Presenter: Mary Pitts

Mentor: Jennifer Winther

Tropical rainforests have the highest biodiversity of plants and animals in the world including the largest and most diverse community of epiphytes. Eight species of the epiphytic fern *Elaphoglossum* were collected from the lower-trunk community in El Yunque National Forest, Puerto Rico. Hydraulic traits in the lamina, stipe, and rhizome were measured in each of the eight species based on sectioned plant material. This project will contribute anatomical data to further our understanding of niche differentiation in epiphytic ferns based on hydraulic traits.

KIRKHOF CENTER GRR 046

Driving Self-perceptions in Persons with Early Stage Alzheimer's Disease: A Simple Survey

Participants attending 9:00 AM - 10:00 AM

Presenter: Megan Owens

Mentor: Rebecca Davis

Driving cessation in older adults is associated with negative effects on functionality, mental health, and life expectancy. By addressing driving concerns among patients with cognitive impairment, driving cessation may occur later in the disease trajectory while still promoting safety within the population. Data were collected using a simple survey completed by persons with early stage Alzheimer's disease (AD) and mild cognitive impairment (MCI). Driving frequency, habits, and wayfinding ability of the AD/MCI group were compared to a control group in order to understand the overall differences in the self-perception of driving ability. This information can be used to help guide primary care providers when addressing driving safety and cessation with the AD/MCI population.

KIRKHOF CENTER GRR 047

Utilization of Polymerase Chain Reaction (PCR) to Evaluate Nonylphenol Exposed Tissue Samples

Participants attending 10:00 AM - 11:00 AM

Presenter: Kasey Wilson

Mentor: Daniel Bergman

Nonylphenol (NP) is a commonly used surfactant in a variety of industries. NP accumulates in aquatic environments and several studies have shown reduced olfaction, impaired gonad development, and feminization in a variety of species after exposure. Previous research suggests that NP exposure can also lead to reduced molting. Molting is triggered by ecdysone release or inhibited by molt-inhibiting hormone (MIH) release, this decrease in molting could be attributed to interference with either aspect of this system. However, changes in the concentrations of these hormones are not the only possible site of interference as competitive receptor binding inhibition could change molting frequency. We hypothesize that NP will disrupt the molting hormone signaling pathways. To test this hypothesis, we utilized the Polymerase Chain Reaction (PCR) to monitor the upregulation or downregulation of both Ecdysone and MIH in gonadal tissue exposed to NP.

KIRKHOF CENTER GRR 048

Belonging, Physical Safety, and Interest in Exploring Novel Environments

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

Presenters: Tiesjwan Hughes, Lauren Sullivan

Mentor: Kristy Dean

Several social psychological theories — including attachment theory (Bowlby, 1982) — suggests that our needs for

physical safety and belonging are inherently connected. Recent research shows that threats to belonging signals vulnerabilities in physical health and safety (Dean, Wentworth & LeCompte, 2019). The current study examines how social exclusion shapes feelings of safety during exploration, an attachment concept that involves interacting with novel information or environments. Consistent with hypotheses, experiencing a social exclusion (vs. acceptance) decrease interest in exploring physical ideas or social interactions. Additional findings suggest that attachment anxiety also plays a role in exploration. Discussion will center on future directions, including alternative methods for studying the relationship between safety, belonging, and environmental exploration.

KIRKHOF CENTER GRR 049

MicroRNA-34b/c as Disease Progression Biomarkers for Parkinson's Disease

Participants attending 12:00 PM - 1:00 PM

Presenter: Ashleigh Harrah

Mentor: Sok Kean Khoo

Parkinson's Disease (PD) is a neurodegenerative disorder that causes impaired motor control, muscle tremors, and bradykinesia. While the cause of PD is unknown, it has been found that PD patients have decreased levels of dopamine due to aggregation of alpha-synuclein protein in their dopaminergic neurons. MicroRNAs (miRNAs) are small, regulatory molecules that bind to complementary messenger RNA to inhibit or decrease protein expression. It is observed that downregulation of miRNA34b/c leads to an increase of a-Syn in cell cultures and brain tissues. Here, we used quantitative real-time PCR to evaluate the expression of miRNA34b/c in sera of patients with fast and slow progression PD at time of diagnosis. Our results showed fast progression PD patients have significantly higher expression of miRNA34b/c (p-value: 0.0025 and 0.0156), when compared with slow progression PD patients. Thus, miRNA34b/c may serve as blood-based biomarkers to differentiate and track progression of PD.

KIRKHOF CENTER GRR 050

Asian American Identity on Reddit: Representation Versus Reality

Participants attending 3:00 PM - 4:00 PM

Presenters: Chance Colter, Emily Gibson, Jane Wickey

Mentor: Kathryn Remlinger

This study examines the language ideology that informs discourse in various Reddit communities that are dedicated to addressing unique aspects of the Asian American experience. Patterns of stereotyping, aggressing, and Othering Asian Americans will be analyzed through a qualitative study of the linguistic features in posts and comments. Preliminary research suggests that Asian American individuals are subject to specific forms of subordination through language on the basis of their gender and generational status.

KIRKHOF CENTER GRR 051

Metal Toxicity in *S. Lugdunensis*

Participants attending 3:00 PM - 4:00 PM

Presenter: Jordyn Holland

Mentor: Kathryn Haley

S. lugdunensis is found as part of the microflora of human skin but is an opportunistic pathogen. The mechanisms by which *S. lugdunensis* utilizes to infect the host is still unclear. The vertebrate host represents a source of metals, and bacteria have evolved strategies for their utilization. Host homeostasis changes in response to bacterial

infections, producing sequestering proteins and bombarding bacteria with toxic levels. Coevolution has created a battle for metals such as heme, copper, zinc, and manganese, required trace elements for life. Due to their redox properties, metals serve as cofactors for enzymes for bacterial processes. Our research identifies what concentrations these metals does *S. lugdunensis* experience toxicity, allowing for further investigation of its metal regulation. Understanding the quantitative value of metal toxicity in *S. lugdunensis* and mechanisms by which it regulates the set point and how this regulation changes in infection is vital for treatment.

KIRKHOF CENTER GRR 052

Analyzing the Effect of Degraded Proteins on the Control of *Candida Albicans* Filamentation

Participants attending 12:00 PM - 1:00 PM

Presenter: Carolina Reis

Mentor: Derek Thomas

Candida albicans is a fungal opportunistic pathogen that naturally colonizes humans at multiple locations in and on the body. It is a leading cause of nosocomial infections and has high mortality rates, particularly for immunocompromised patients. *C. albicans* can develop into yeast or filamentous forms the latter of which have been linked to the organism's pathogenicity and ability to infect hosts. Previous studies in our lab have identified certain proteins whose presence may negatively influence the transition to filamentation. Our current understanding of the function of these proteins is limited and additional investigation is needed to fully understand the relationship between their expression levels and the suppression or development of the filamentous forms. To further explore this, we have taken the approach of overexpressing some of the recently identified proteins under conditions that promote filamentous growth of *C. albicans* and found varied effects on morphology.

KIRKHOF CENTER GRR 053

Gendered Discursive Practices in *The Tonight Show Starring Jimmy Fallon*

Participants attending 4:00 PM - 5:00 PM

Presenters: Brittani Kooiker, Kyrah Ross

Mentor: Kathryn Remlinger

This study examines the performance of gender in the Youtube video, "Kim Kardashian West Talks Prep for Baby #4 and Criminal Justice Reform", from *The Tonight Show Starring Jimmy Fallon*. We use the transcript to analyze Kim Kardashian's and Jimmy Fallon's uses of speaking strategies such as interruptions, and we apply performance theory to show how these speech features construct their presented genders. Our preliminary findings show that while their speaking strategies have created for them very gendered personae, they do not fall under commonly held stereotypes of men and women's speech. The interruptions from both speakers are used to support the other, subverting the stereotypically gendered expectation that the man, Fallon, would resort to 'report' speech — task-focused, 'rational', seeking completion instead of connection — rather than 'rapport' speech, which is socialization-focused, 'emotional', and connection seeking.

KIRKHOF CENTER GRR 054

Increasing Breastfeeding for Sustainability Among African American Women

Participants attending 9:00 AM - 10:00 AM

Presenter: Regina Kirwin

Mentor: Kelli Damstra

African American women have the lowest breastfeeding rates in the United States. Evidence shows that peer support increases breastfeeding rates. The purpose of this project is to develop an evidence-based toolkit guided by data derived from a previously implemented pilot program. The program consisted of African American moms providing breastfeeding support to other African American moms. This toolkit will provide evidence-based resources to help increase breastfeeding sustainability. It will provide key stakeholders the information and skill development needed to successfully implement and sustain programs geared toward increasing breastfeeding rates in African American women. The information gained from secondary analysis will be the driving force for the toolkit content. The short-term outcome is to provide a readily available toolkit with the necessary resources for breastfeeding support. The long-term outcome is increasing the health of women and children in the community.

KIRKHOF CENTER GRR 055

Walk It Like I Talk It: An Analysis of the Language and Opposition of AAE

Participants attending 3:00 PM - 4:00 PM

Presenters: Drake Gomez, Antewnet Melton

Mentor: Kathryn Remlinger

Linguists have studied African American English (AAE) for over 40 years. However, this language can be traced back to the 15th century slave trade. Today, we experience AAE in unavoidable experiences; from social media to television commercials. In our analysis, we will show that it is not necessarily the language that isn't accepted (solely) but the culture that has become stigmatized.

It would seem that with the vast range of influence, AAE would be more acceptable across mediums. However, the rigid conventions of *Standard* English (SE) ideology has imposed alternative beliefs and practices. Our preliminary findings lead us to believe that the naturalization of SE has caused other dialects to become undermined. A misguided "truth" about language use has caused AAE to become a spectacle; used for entertainment and other means of exploitation. We will show that this ideology fosters systematic appropriation.

KIRKHOF CENTER GRR 056

Body Tempering and RPR

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

Presenters: Lilyann Plummer, Casey Schaeff

Mentor: Brian Kipp

Fascia is one large piece of continuous tissue that connects the whole body and connects intimately with the muscular system. When pain occurs and overall body performance is reduced, myofascial release (MFR) and Reflexive Performance Reset (RPR) are techniques that may relieve pain and improve body performance. Body Tempering (BT), a type of MFR, involves using steel cylinders to roll out tight or sore muscles. This slow, extended compression is thought to stretch the fascia further and more intensely than normal stretching, foam rolling, or massage, which helps to relieve pain and tightness. RPR builds the facial tissue - neurological connection through the potential activation of facial mechanoreceptors etc. Our intent is to investigate the physiological responses to BT and RPR and whether or not they cause physical changes in muscle tissue and improved performance through reinforced neurological- facial tissue connection.

KIRKHOF CENTER GRR 057

The Influence of Family Structure on Youth Behavior

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

Presenter: Tiana Ogletree

Mentor: Jacquelynn Doyon-Martin

Scholars have examined the relationship between family structure and youth delinquency for decades. Practitioners in the fields of juvenile justice and social work seek to better understand the connection between family and delinquency in order to better facilitate youth rehabilitation. This research will evaluate if and how family structure impacts youth behavior and delinquency. The summative findings of a literature review will be outlined in a poster presentation.

KIRKHOF CENTER GRR 058

Effects of Cannabidiol on Crayfish Behavior

Participants attending 4:00 PM - 5:00 PM

Presenters: Cole Richter, Christopher Timmer, Madison Zielinski

Mentor: Daniel Bergman

The most prevalent mental disorder in the US is anxiety. One method of treatment is use of SSRIs which allow for increased activation of serotonin (5-HT) receptors. Cannabidiol (CBD) is a cannabis derived compound which has been shown to decrease anxiety also by activation of 5-HT amine receptors. Unlike SSRIs, CBD has very few side effects. Decapod crustaceans, especially crayfish, have recently emerged as a novel approach to studying drugs of abuse. Our study of *Orconectes propinquus* crayfish aims to compare behavioral patterns between CBD and 5-HT. Firstly, we aim to observe and measure change in aggression during fighting. Secondly, we aim to observe and measure differences between food seeking behavior in a Y-maze via time or amount consumed. Lastly, we aim to measure neural activity in tail tissue via Action Potential (AP) frequency after administration of CBD, 5-HT or agonist, and 5HT receptor blocker.

KIRKHOF CENTER GRR 059

Resettlement in the United States: A Study of Refugees

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

Presenter: Mitchell Plichta

Mentor: John Constantelos

This project examines the effects of immigrant refugee populations in the United States. From the end of the Second World War, immigration policy as it relates to displaced people has become a prominent topic in American politics. Research has revealed the long-term benefits from incoming refugees. Although outcomes are initially poor for displaced people in the U.S., with high unemployment and low earnings, the benefits become apparent after about five years in the country. Employment rates are considerably higher than those of natives, and taxes paid to the government give a net benefit over the resources that refugees use. The presentation includes a review of the extant literature and it presents a survey research design and analytic methods for future research on the experience of refugees in the United States.

KIRKHOF CENTER GRR 060

Community Analysis of Rockford, MI

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

Presenters: Laura Pierson, Robert Reid, Douglas Tawney

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Rockford, Michigan, obtained from the American Community Survey.

KIRKHOF CENTER GRR 061

Reactions of Vinylsilyl Anions

Participants attending 9:00 AM - 10:00 AM

Presenters: Michelle Brown, Nicole Yakimovich

Mentor: Randy Winchester

Resonance is one of the most important concepts in chemistry. The most common example of resonance is the allyl anion. Vinylsilyl anions are allyl anions with a silicon replacing the carbon. The two resonance structures are not equivalent and our goal was to probe the corresponding contributions of the different resonance structures to the stability of the anion. To do this we studied the reactions of the vinylsilyl anion with several electrophiles to see if the reaction occurred at the silicon or the carbon. Every reaction we studied resulted in the reaction happening at the silicon atom. Finally, we studied the reaction of the anion with the ketone adamantanone and obtained products which were identified by x-ray crystallography solved by Dr. Biroš and Dr. Staples from MSU.

KIRKHOF CENTER GRR 062

Community Analysis of Kalamazoo, Michigan

Participants attending 10:00 AM - 11:00 AM

Presenter: Quintin Haring

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Kalamazoo, Michigan, obtained from the American Community Survey.

KIRKHOF CENTER GRR 063

Examining the Awareness of Physician and Health Professions on The Bredesen Protocol™ | MPI Cognition as a Potential Cure and Treatment for Alzheimer's Disease

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

Presenter: Kiley Ferer

Mentor: Julia VanderMolen

For many years, Alzheimer's disease had no cure and no form of treatment. This changed with the research conducted by Dr. Dale Bredesen MD, who created the first form of prevention and treatment for Alzheimer's disease. Dr. Bredesen MD published his full protocol in 2017 and starting to train other health professionals to use the protocol with their Alzheimer's patients. This study is looking at the effectiveness of the protocol from the eyes of the health professionals in the form of online surveys, who are trained in the protocol and how the protocol is helping their patients. Furthermore, this study looks at how health professionals trained in The Bredesen Protocol™ | MPI Cognition are educating their patients and the general public and this new approach to treating, and possibly curing Alzheimer's disease.

KIRKHOF CENTER GRR 064

A Test of the Impact Bias in Consumption of Unhealthy Snack Foods

Participants attending 11:00 AM - 12:00 PM

Presenter: Hanali Gilbert

Mentor: Amanda Dillard

This study examined if there was an impact bias (tendency to overestimate intensity of future emotions) for unhealthy foods. Participants (N=123) reported their anticipated and experienced positive (e.g., happiness) and negative (e.g., regret) emotions surrounding the consumption of unhealthy foods. Analyses were conducted to test if participants' anticipated emotions were more intense than their experienced emotions, and if emotions were associated with subjective pleasure and future behavior intentions. Findings showed that participants significantly overestimated both positive and negative emotions. In other words, they anticipated more regret and more happiness than they experienced. Experienced emotions but not anticipated emotions were associated with pleasure in expected directions. Moreover, only experienced negative emotions (not anticipated emotions, and not positive emotions) were associated with behavior intentions to reduce unhealthy foods in the future.

KIRKHOF CENTER GRR 065

Are GVSU Students Aware of the Negative Impacts of Vaping?

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

Presenter: Molly Wilson

Mentor: Hsiao-ping Chen

This course project was conducted through an on-line survey about whether students at Grand Valley are aware of the negative impacts that vaping can have. Vaping has become extremely popular, and socially in college aged students as well as high school students in the past few years. I find it a very interesting topic and wanted to learn more about why people continue to vape. The findings showed that students who vape socially do not consider themselves to "currently vape," which suggests that vaping is socially pressured and glamorized driven. Another interesting finding was that almost the same amount of students have and have not vaped done research about the long term effects of vaping.

KIRKHOF CENTER GRR 066

Improving Resolution of GAP-43 Isoforms: A Potential Biomarker for Alzheimer's Disease

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

Presenter: Yousif Slim

Mentor: John Capodilupo

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by cognitive and behavioral impairment. Efforts to identify biomarkers of AD pathogenesis largely focus on examining levels of β -Amyloid plaques and neurofibrillary tangles. As a result, additional primary pathogenic factors of AD potentially contributing to neuronal death and synaptic dysfunction have been less appreciated. It is for this reason that our main focus is to extract and isolate the phosphorylated and non-phosphorylated isoforms of GAP-43, a growth associated protein widely expressed in neurons. Previous findings have demonstrated that the phosphorylated isoform is indicative of learning and memory formation. We believe that the relative ratio of these two isoforms may serve as a novel biomarker for AD and a potentially new target for drug therapy. To support our hypothesis, we are currently altering our 1D and

2D-SDS-PAGE techniques in order to enhance resolution of GAP-43 isoforms.

KIRKHOF CENTER GRR 067

Identification of the Bacteria that Form Root Nodules with Pea Plants at the SAP.

Participants attending 10:00 AM - 11:00 AM

Presenter: Gwynne Powell

Mentor: Jennifer Winther

Root nodules are plant structures that house special bacteria that convert atmospheric nitrogen (N_2) into ammonia (NH_3). We isolated and identified the species of bacteria that form symbiotic root nodules on pea plants grown at the SAP. We identified the species of bacteria based on sequences of the small subunit of the ribosomal DNA (16S). We plan to quantify the benefit of the different bacterial species to the pea plants in a controlled greenhouse setting. At the completion of this project we hope to have identified those bacteria that are the best nodule symbionts with the peas grown at the SAP and to be able to provide the SAP with beneficial bacteria inoculum.

KIRKHOF CENTER GRR 068

Ghanaian English Today: Variations in Usage and Prestige

Participants attending 2:00 PM - 3:00 PM

Presenter: Melissa Dean

Mentor: Dan Brown

Ghanaian English today encompasses variations of English that still emerge due to the rich linguistic landscape that Ghana houses. Despite the many variations of these Englishes, unique features still unite them all, in comparison to more prestigious global Englishes such as American or British English. Through searching online databases and archives, these features -and the prestige of their usage depending on context- emerged. Discussion and analysis of data from a sociolinguistic and historical perspective on the linguistic features that Ghanaian English maintains today illustrates its strong global identity. Despite English spreading here through colonization, Ghanaian English now takes on roles in overtly prestigious mediums such as academia and media, as well as more sacred contexts such as religion, in fluid ways that transcend its roots. Now, it is our role as foreigners to learn and view these variations as the prestigious Englishes that Ghanaians have upheld for decades.

KIRKHOF CENTER GRR 069

Community Analysis for Ada Township

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

Presenters: Quinn Kendra, Sarah Lorenz, Taylor Nelson

Mentor: Mark Hoffman

A visual community profile of the demographic, social, and economic characteristics of Ada Township, Michigan, obtained from the American Community Survey.

KIRKHOF CENTER GRR 070

Evaluating the Response of Peripheral Blood Vessels Exposed to Hypothermia

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

Presenters: Ahmad Khatib, Christian Matich

Mentor: Francis Sylvester

Recent clinical studies have indicated a relationship between hypothermia and cardiac arrest. Additional studies have shown that cold temperatures are known to constrict blood vessels via stimulation by the autonomic nervous system. We will be measuring changes in the diameter of porcine peripheral facial veins exposed to different temperatures, in the presence and absence of a sympathetic antagonist. We hypothesize that the antagonist will minimize the impact of cold temperature on vasoconstriction. Completion of this study may have implications for the use of sympathetic antagonists for patients with cardiovascular disease, particularly those living in extreme weather conditions.

KIRKHOF CENTER GRR 071

Comparison of Two HPV Vaccines, Cervarix and Gardasil, and Their Effectiveness on HPV Subtypes 16 and 18

Participants attending 9:00 AM - 10:00 AM

Presenter: Courtney Krause

Mentor: Lori Houghton-Rahrig

Problem: The Human Papillomavirus (HPV) is a known risk factor of cervical cancer. Purpose: Two vaccines, Gardasil and Cervarix, are investigated on their efficacy in preventing HPV type 16 or 18 in adolescent girls. Search Strategy: Articles from PubMed, CINAHL, and Web of Science published between 2009 to 2016 including females 10-26 years of age. Results: CervarixÇand GardasilÇhave high efficacy rates against HPV 16 and 18. CervarixÇdemonstrates having a larger antibody titer than GardasilÇ. For HPV strains 31, 33, and 35, GardasilÇproved to have efficacy rates of 98% compared with CervarixÇ. Synthesis of Evidence: Both vaccines have nearly a 100% protection rate against HPV 16 and 18.

KIRKHOF CENTER GRR 072

Influencing the American Public: How Reagan and the OPD Sought to Mislead the American Public on the Matter of Nicaragua

Participants attending 1:00 PM - 2:00 PM

Presenter: Jorgen Reberg

Mentor: David Stark

My research concerns the use of propaganda by the U.S. government during the Dirty Wars era in Latin America (1970s to late 1980s). In particular, I focus on the efforts to deceive the American public on the matter of Nicaragua during the reign of the Sandinistas. The reasoning for doing so was based in the fear regarding the threat of communism in Latin America, which is also inexorably connected with the economic interests of the capitalist system in America. This relates to my primary question whilst conducting this research: was this purely a case of ideological conflict, or were there also ulterior economic motives for furthering a false narrative regarding the situation in Nicaragua? In summation, my research concludes that the answer to my research question is dependent on the individual; that is to say, every individual falls somewhere on the spectrum between being purely politically motivated and purely economically motivated.

KIRKHOF CENTER GRR 073

Evaluation of a Simulation-based Nurse Residency Program

Participants attending 10:00 AM - 11:00 AM

Presenter: Cheri Van Wyngarden

Mentor: Marie VanderKooi

Background: Simulation-based nurse residency programs narrow the transition to practice gap. Objectives: To conduct a program evaluation. Methods: Data from new graduate nurses who participated in either the traditional nursing orientation or the pilot simulation-based nurse residency program (NRP) was collected. Analysis between the two groups was incomplete due to small sample size of the traditional participants. Pre and post-simulation differences within the NRP were analyzed for competence, confidence, satisfaction and retention. Results: Few differences exist pre and post simulation but descriptive statistics gave insight into strengths and opportunities for improvement. Conclusions: Continued program evaluation is necessary to identify strengths and weaknesses. Implications: The NRP should strive to enhance quality of care, safety, and promotion of an evidenced-based culture by incorporating concepts of holism, patient safety and communication.

KIRKHOF CENTER GRR 074

Calculating the Fractal Dimension of Simulated Cosmological Data

Participants attending 9:00 AM - 10:00 AM

Presenter: Nicholas Jones

Mentor: Brett Bolen

We have attempted to measure the Hausdorff Dimension of the universe simulated by the Illustris project using the box counting algorithm. By measuring the fractal dimension of this simulated universe we can get an idea of how galaxies and nebulae fill space at different distance scales. For objects with a constant Hausdorff dimension, this level of "detail" remains constant. Analysis of the fractal dimension of cosmological gas and dark matter also tells us something about the dynamics of these enormous systems. This dimension gives us an idea of how completely a set of points can fill a given space. For example, the Hilbert curve, a space filling fractal curve, has a Hausdorff dimension of two. This is due to the fact that space filling curves cover the entire plane when they are brought to their limit. Not all fractals have integer value dimensions though. Approximations of fractal geometry occur everywhere in the natural world, just like approximations of smooth geometries.

KIRKHOF CENTER GRR 075

Battling Injustice Across Time

Participants attending 9:00 AM - 10:00 AM

Presenter: Xavier Golden

Mentor: Jae Basiliere

The Young Lords Organization began as a street gang, formed out of necessity in Chicago's Puerto Rican neighborhoods, and throughout the sixties, they grew into revolutionary liberationists modeled after the Black Panther Party. The YLO protested police brutality, US imperialism, white supremacy, fascism, and many other social injustices with direct action activism in a manner reminiscent of modern-day social justice groups, the most prominent being Antifa, an organization of militant anti-fascists. Drawing a link between the YLO--activists of yesteryear-- and the contemporary Antifa, my research seeks to compare and contrast the two leagues of social justice warriors through the allegorical frame of comic book superheroes.

KIRKHOF CENTER GRR 076

Effects of Social Isolation on the Aggression of Crayfish

Participants attending 2:00 PM - 3:00 PM
 Presenters: Lauren Kavner, Alexander Phillips
 Mentor: Daniel Bergman

Aggressive interactions between crayfish 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 socially isolated crayfish and those living with other crayfish (termed social crayfish). Aggression was assessed by comparing the interactions between two groups of social crayfish, isolated crayfish, and a group of both social and isolated crayfish. To reduce bias, crayfish within 5% of each other's masses were matched to interact in each trial. They had 15 minutes to acclimate to the container where they interacted and were able to interact for 20 minutes; the intensity of each interaction was recorded using an ethogram for aggressive behavior. It was anticipated that the crayfish would be more aggressive following social isolation. Information from this study can be utilized to improve our understanding of how crayfish behavior is affected by environmental factors that cause social isolation.

KIRKHOF CENTER GRR 077

Analysis of ^{226}Ra in the Grand River by Method of Gamma Spectrometry

Participants attending 9:00 AM - 10:00 AM
 Presenter: Aidan Thimm
 Mentor: Douglas Furton

Several water samples were collected from the Grand River and tested for the presence of ^{226}Ra by method of gamma spectrometry. Radium was recovered from the samples using Purolite C100E, a strong acid cation exchange resin. Gamma spectrometry was performed using a Canberra GX3020 HPGe detector. Water samples were collected from multiple locations on the river: upstream, downstream, and in the middle of Grand Rapids. In addition, an Allendale groundwater sample was collected and analyzed for external comparison. The gamma signature of each sample was compared in order to determine whether or not the river flowing through Grand Rapids contributed to increased ^{226}Ra levels in the water.

KIRKHOF CENTER GRR 078

Development History of Wayne County

Participants attending 9:00 AM - 10:00 AM
 Presenter: Christopher Selasky
 Mentor: Mark Hoffman

This poster will talk about the characteristics of Wayne County, Michigan and the developments that took place over the years.

KIRKHOF CENTER GRR 079

Scots in Scottish English: Identity through Linguistic Choice

Participants attending 2:00 PM - 3:00 PM
 Presenter: Hillary Rentfrow
 Mentor: Dan Brown

This research explores the Scottish variety of English and the issues in the definition between Scots, Scottish Standard English (SSE), and Standard English (SE). Linguistic information on the elements of SSE and Scots

from previous research was collected to show the distinct features of the variety in comparison to SE. Audio samples were collected from the Speech Accent Archive from George Mason University, as well as from authentic speakers on YouTube, to demonstrate these features in current language use. Further research using articles on sociopolitical and identity issues related to the use of Scots and SSE are explored for the connection of linguistic choice and societal impact. This research argues that due to distinct historical roots surrounding language use, policy, and identity, the use of Scots in SSE will continue to be blurred as awareness of Scottish identity evolves in response to the modern world.

KIRKHOF CENTER GRR 080

Using Fossil and Lithologic Evidence to Determine the Cause of Cyclicity Between Mud and Shell-rich Deposits in the Upper Ordovician Fairview Formation, Northern KY

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

Presenters: Tyler Baker, Ian Beek, Lauren Chwojnicky, Colleen Rankin, Claire Thomassen

Mentor: Peter Riemersma

The origin of fossiliferous shell layers at the striking outcrop of the Fairview Formation (485-444 million years ago) has been debated in the scientific community. These limestone beds alternate with mudstone beds and can be explained by two possible models: the storm proximity model and the episodic starvation model. The storm proximity model attributes the interbedded mud and limestone cyclicity to periodic storm events that caused the variation in the bedding seen today. The episodic starvation model relates the abundance of fossils in the strata to a reduction in sediment supply during a relatively long period of time. We will interpret the environment and depositional conditions of the limestone found at this outcrop by analyzing shell concentration and fragments along with lithology using hand samples and thin sections.

KIRKHOF CENTER GRR 081

Using Sentiment Analysis to Explore Customer's Subgroups

Participants attending 2:00 PM - 3:00 PM

Presenter: Kaitlyn Pall

Mentor: Bradford Dykes

Text mining in statistical research is an excellent way of finding word and phrase frequencies. Sentiment analysis is often used as a segway in text mining for manipulating ubiquitous words, ultimately unveiling trends of emotion throughout a dataset. Text can be pulled anywhere from a stored database, to questionnaires for manipulation and analyzation. Measuring company customer's inclination of opinions aids the diagnosis of potential issues concerning the company. Sentiment analysis will be used to view customers emotions towards company's product, in addition to how customer subgroups (e.g., reoccurring or first time users) feelings differ and change over time. Analysis of sentiments within text mining is a straightforward process for clients to view frequent words/sentiments in datasets. Visualization of these sentiment results will also be created to enhance our understanding.

KIRKHOF CENTER GRR 082

Using Screencast and Simulations to Help Chemistry Students Understand Equilibrium

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

Presenters: Stella Archiyan, Lauren Miling

Mentors: Deborah Herrington, Jessica VandenPlas

Simulations allow students to independently interact with a program and control variables, while screencasts are instructor-lead videos that students can view. Research shows that both simulations and screencasts can improve student learning; however, research focusing on how students use these tools on their own is scarce. This project seeks to understand how students interact with simulations and screencasts to develop conceptual understanding of the concept of equilibrium by presenting data from scaffolded student use of the PhET reactions and rates simulation and a matching screencast. This poster will present data from a pre-post analysis of student responses to assignment questions and eye-tracking data measuring student attention while interacting with the screencast or simulation. These data will highlight the results of scaffolding student use of electronic resources as well as differences between students' interactions with the simulation versus the screencast.

KIRKHOF CENTER GRR 083

The Genesis of Ball and Pillow Structures in the Fairview Formation; Maysville, Kentucky

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

Presenters: Derek Holmes, Kayla Rooney, Cathlynn Shagonaby, Kera Sharpe, Joshua Walker

Mentor: Peter Riemersma

Maysville, Kentucky is an ideal site for sedimentological study, as it hosts a multitude of rock outcrops that expose the geological history of the region. The Upper Ordovician Fairview Formation is comprised of 450 million year old limestone and shale strata, exposing a soft-sediment deformation structure called ball and pillow structures. These structures are comprised of isolated protrusions of sediment into underlying mudstones, likely related to density instability. Multiple theories exist to explain their formation such as, depositional loading, liquefaction, and seismic shock. Ball and pillow structures are found in certain horizons in our outcrop, but not in others. This raises the question; what controlled their occurrence at this site? To determine the cause of formation, we will use thin sections to assess grain deformation, examine hand samples and outcrop photos of the structures and review the published literature.

KIRKHOF CENTER GRR 084

MicroRNAs in Urine as Detection Biomarkers for Parkinson's Disease

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

Presenters: Katelyn Anthony, Mark Cunningham

Mentor: Sok Kean Khoo

The diagnosis of Parkinson's disease (PD) is based on subjective observation of motor symptoms, which occur after 50-80% of a patient's dopaminergic neurons are lost. It is therefore imperative that all biological biomarker options be tested in the hopes of finding a clinical tool to aid and quicken diagnosis. Urine can be obtained cheaply and noninvasively, and would therefore be an ideal source for diagnostic markers. MicroRNAs are small RNAs that regulate gene expression by binding to the 3'-UTR of messenger RNA and are stable in biofluids. Using Firefly Microparticle Technology, we examined expression of 65 neurologically-related microRNAs in the urine of PD patients and a healthy control group. Many of these microRNAs were detectable in urine, and we found several which were more highly expressed in the PD group.

KIRKHOF CENTER GRR 085

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

Participants attending 9:00 AM - 10:00 AM

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 086

Language Shift in Popular Media: The Case of Advanced Dublin English

Participants attending 2:00 PM - 3:00 PM

Presenter: Tristan Kittle

Mentor: Dan Brown

Research by Hickey (2012) suggests that advanced Dublin English is the dialect currently reshaping the sounds of Southern Irish English. Hickey (2012) also suggests that, in the near future, advanced Dublin English could spread throughout the Republic of Ireland to become the main Irish English dialect. Kirk (2011), however, provides an account of Irish English which connects the variety to a more diverse range of sounds. The current study aims to investigate the diversity of Irish English sounds in popular media by analyzing speech samples collected from YouTube. In addition, the data will be examined for sounds associated with advanced Dublin English in order to investigate the current status of the dialect beyond the Dublin context. Results may aid in predicting potential changes to Irish English in the near future as well as generate discussion about the importance of language shift.

KIRKHOF CENTER GRR 087

Testing a Predicted Cytoskeleton Regulatory Gene for a Role in Filamentation

Participants attending 2:00 PM - 3:00 PM

Presenter: Hannah Kirshman

Mentor: Ian Cleary

Candida albicans is a member of the normal microbiota found within the body. However, for individuals with compromised immune systems, a *C. albicans* infection of their organ systems can be fatal. An important virulence factor is the ability to filament. The aim of our experiment was to examine the role of the uncharacterized gene *orf19.2304* in *C. albicans* filamentous growth. We have constructed strains over-expressing this gene and are testing whether this leads to a changes in filamentous growth. Our results so far indicate that over-expressing this gene can affect cellular growth in some conditions, including an increase in flocculant growth.

KIRKHOF CENTER GRR 088

Fly On In: Improving *Drosophila* Genome Sequence for Comparative Annotation of Transcription Regulatory Sites Between Closely Related Species

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

Presenters: Jillian Guthrie, Sisi Hon, Brianna Mulder, Samantha Parshall, Dashaun Ragland, Megan Range, Warren Sink, Ashley Spagnuolo, Payton Zielinski

Mentor: Martin Burg

With support from the Genomics Education Partnership (GEP), DNA sequence improvement was performed to prepare it for further use in the course CMB 440: *Drosophila* Genomics Research. Sequence improvement corrects errors in mononucleotide repeat regions in the DNA sequence. Secondary goals include correcting gaps and identifying polymorphic regions in the sequence using the program CONSED. Each student in the course conducts comparative annotation of a 80 kb region of DNA sequence from a *Drosophila* species, comparing to *D. melanogaster*. As a result, gene models are created, including transcription start sites and other motifs suspected to be involved in regulation of gene expression, using tools such as BLAST. The completed student research results are submitted to the GEP database, furthering the scientific knowledge of comparative genomics in *Drosophila* and providing undergraduates an experience in transforming genomic sequence data into an annotated genome.

KIRKHOF CENTER GRR 089

Studying the Protective Effects of ERK 1/2 Against High-Fat Diet Induced Obesity.

Participants attending 11:00 AM - 12:00 PM

Presenter: Jacob Knowlton

Mentor: Ruijie Liu

To study the effects of extracellular signal-regulated kinases 1 and 2 (ERK 1/2) on metabolism, genetically modified mice deficient in both dual-specificity phosphatase 6 and 8 (DKO) were submitted to a 14-week high-fat diet (HFD, 60%, fat composition) regiment. Body weight measurements of both DKO and wild-type (WT) mice were taken biweekly after being placed on the HFD. After a 16-hour fasting period, baseline blood glucose measurements were taken, and each mouse was administered glucose (2 grams glucose per 2 kg body weight). Blood sugar measurements were recorded at intervals of 15, 30, 45, 60, 90, and 120 minutes. The insulin resistance testing required 6 hours of fasting prior to testing and was accomplished by administering 0.75 unit per kg of insulin. The WT mice placed on the HFD demonstrated significant increases in their body weights when compared to both control and DKO mice ($P < 0.05$ vs. WT-HFD).

KIRKHOF CENTER GRR 090

CRF2 Receptor Regulation of Depressive-Like Behavior During Protracted Ethanol Withdrawal

Participants attending 11:00 AM - 12:00 PM

Presenter: Lavar Green-Jackson

Mentor: Glenn Valdez

Alcoholism is the third leading preventable cause of death in the United States. While there are certain medications to help treat alcoholism, there are none that pacify depressive symptoms experienced following long-term withdrawal. This study seeks to understand why individuals experience depression during alcohol withdrawal, which

often leads to relapse. In our experiment, we examined the ability of the CRF2 receptor to alleviate depressive-like behaviors following long-term withdrawal from alcohol by investigating the ability of Urocortin 3 (Ucn 3), a neuropeptide that selectively activates CRF2 receptors, to reverse immobility in the forced swim test, an animal model of depression. We predict that the animals injected with the Ucn 3 will display less immobility compared to rats that are injected with the control solution. After analyzing our results, we hope to find a treatment for humans experiencing depression following long-term alcohol withdrawal.

KIRKHOF CENTER GRR 091

Digital Storytelling in Second Language Classrooms

Participants attending 1:00 PM - 2:00 PM

Presenter: Nguyet Nguyen

Mentor: Colleen Brice

Digital storytelling—the production of stories using multiple media (photographs, text, music, etc.)—has recently become popular as a writing assignment in second language classrooms (Castañeda, 2013). To investigate whether digital storytelling is effective pedagogically, I have conducted a review of existing studies on digital storytelling in second and foreign language classrooms. Major findings have suggested that digital storytelling offers L2 writers opportunities to engage in meaningful communication process, enables their self-autonomy, critical thinking, creativity, and encourages a great sense of community (e.g., Hur & Suh, 2012; Sylvester & Greenridge, 2009). This poster presentation presents main research findings on digital storytelling, with suggestions for available sources for digital storytelling in L2 classrooms being made.

KIRKHOF CENTER GRR 092

Giving Back to the Community: Volunteerism in the Workplace Today

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

Presenters: Amy Blaker, Kyle Chartier, Marissa Medici, Amanda Witsaman

Mentor: Lisa Sisson

Volunteerism in the hospitality industry is gaining popularity and attention; whether that be by giving employee paid time off to volunteer, volunteering regularly as a company, hosting an event that is run by volunteers, or even by encouraging convention guests or industry professionals to volunteer in the area where an event or meeting is being held. There is no denying that volunteerism plays a prominent role in a company's Corporate Social Responsibility today. This presentation will delve into the benefits and drawbacks of volunteering for both employees and the business as a whole. It will further explain the reasons why companies choose to implement volunteer programs as a part of satisfying the "people" portion of the Triple Bottom Line. Additionally, the presentation will focus in on voluntourism as a new trend in the industry and its impacts on tourists, locals, and the environment.

KIRKHOF CENTER GRR 093

Hospitality & Tourism Management Corporate Social Responsibility within Human Resources

Participants attending 9:00 AM - 10:00 AM

Presenters: Alexandra Hernandez, Kelley Latshaw, Meghan McHugh, Olivia Witsaman

Mentor: Lisa Sisson

Feeling Valued - Successful Human Resource Practices that Empower Employees in the Hospitality and Tourism Management Industry

Companies that incorporate Corporate Social Responsibility into their core mission produce a higher retention rate and enthusiasm amongst employees. Companies that put precedence on employee satisfaction, choosing to use their human resources department to make decisions that create value or incentive for employees ultimately contribute to a positive work environment. This presentation will focus on meaningful human resource practices including discussion about flexible benefits, workplace safety, diversity in the workplace, equal pay, fair recruitment and promotional practices, and an overall feeling of value production. In addition, the presentation will discuss how two local companies and one large corporation implement strong HR policies that ensure employee satisfaction, and in return create exceptional guest service.

KIRKHOF CENTER GRR 094

Environmental Corporate Social Responsibility

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

Presenters: Madison Bystry, Elizabeth Friedman, Braydon Morris, Michael Prestigiacomo

Mentor: Lisa Sisson

Environmental sustainability is a concern within the hospitality industry. Recently, the industry has begun to make strides to improve water usage, food waste, usage of plastic, and utilizing less natural resources. The research presented will explain the issues currently being faced within the industry as well as possible solutions that can be utilized by companies to improve their environmental sustainability. This presentation will explore these options and includes insights from Essence Restaurant Group, Embassy Suites, Mines Golf Course, and Cedar Fair Amusement Parks on how to maintain a socially responsible establishment and remain successful in today's economy.

KIRKHOF CENTER GRR 095

HTM 495 CSR Economics

Participants attending 12:00 PM - 1:00 PM

Presenters: Mikaela Boggiano, Kirsten Croff, Michael Dewicki, Haley Wise

Mentor: Lisa Sisson

Corporate Social Responsibility is one of the key pillars in any great business and its impact on the world through its emphasis on profit, people, and planet. The economic sector plays a significant part in shaping how decisions are made daily. Management decisions need to balance costs of Corporate Social decisions with the benefits that potentially grow the company.. This project will discuss our findings on the economic impact of corporate social responsibility practices on hospitality organizations.

KIRKHOF CENTER GRR 096

Use of Bibliotherapy by Certified Therapeutic Recreation Specialists

Participants attending 1:00 PM - 2:00 PM

Presenter: Kathryn Williams

Mentor: Julia VanderMolen

Bibliotherapy is the use of literature to promote healing (Pehrsson and McMillen, 2010). Bibliotherapy is used in

treatment by a variety of health professionals. This study evaluates the use of bibliotherapy by Certified Therapeutic Recreation Specialists (CTRS) in the state of Michigan and analyzes if they utilize this intervention with proper training and certification. An 18 question survey, developed using Qualtrics, was posted to Michigan Therapeutic Recreation Association (MTRA) Facebook Page. The results showed that 81.82% of respondents do not use Bibliotherapy in their work as a CTRS. Additionally, 19.05% of respondents were unaware what Bibliotherapy was prior to completing the survey. In order to use bibliotherapy to its full benefit, recreational therapists must learn to properly include it in the APIED process. With increased education regarding proper use, bibliotherapy will serve as a strong support to the systematic process of therapeutic recreation.

KIRKHOF CENTER GRR 097

HTM 495 Capstone Project

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

Presenters: Melissa DeWitt, Danielle Dvorchak, Halle Hayes, Duy Ngoc Thanh Nguyen, Hannah Nihem

Mentor: Lisa Sisson

Harassment in the workplace may result in the victim's decreased job satisfaction, resignation from work, less socialization, bad health and some symptoms of post-traumatic stress disorder for persons, as well as lower productivity, mounted absenteeism and rising sick leave costs for organizations (Chan, 2008). Our goal as a group was to create a solution to reduce the harassment culture in Grand Rapids by a two part campaign. First, we implemented a brand into the hospitality businesses in Grand Rapids which showcases their willingness to stop harassment by meeting certain criteria. Secondly, we have implemented a third party hotline where individuals are able to call without the negative and uncomfortable effects of going to one's boss or HR representative with harassment claims. We have achieved these goals by using our research on hotlines and sticker brand campaigns to apply these campaigns into Grand Rapids.

KIRKHOF CENTER GRR 098

We Provide SERVICE Not Servants

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

Presenters: Angelina Bartolotta, Jordan Edwards, Kayla Jeske, Mylia Saa, Brittany Teegardin

Mentor: Lisa Sisson

Harassment in the hospitality industry is a widely known, prevalent issue that is rarely addressed. Coming from guests, co-workers, even management, harassment spans from verbal comments to physical altercations. Some employees may take this as a part of the job but serving guests does not make one a servant; they have human rights too. It's time that the hospitality industry takes a stand against harassment, demonstrating that hospitality is an industry of positivity and satisfaction, not of demeaning dialog, stress, or servitude. Partnering with RESPECT, the purpose of this project is to develop a campaign educating hospitality businesses while also providing tools that empower management and employees to take action regarding harassment in the workplace. The campaign will include a service bell logo reading, "We provide SERVICE not SERVANTS" that will be a visual public display of the industry's commitment to providing positive experiences for both guests and employees.

KIRKHOF CENTER GRR 099

Community Project on Respect

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

Presenters: Emma Cashion, Ashley Sierminski, Taylor Watson, Nicholas Wright

Mentor: Lisa Sisson

According to the EEOC, More than 25 percent of sexual harassment charges filed in the past decade have occurred in industries dominated by service-sector workers. Harassment in the workplace is becoming a cultural norm that is easily placed upon the hospitality industry by society. RESPECT is a hospitality organization whose mission is to proactively improve the culture of our Grand Rapids hospitality environments. The message of the organization is to increase awareness and to raise standards surrounding the current culture within the hospitality industry, primarily in the Grand Rapids area. For this project, we conducted research on topics including sexual harassment and distasteful behaviors, physical and verbal. This project focuses on discussing and comparing current campaigns, business practices, techniques and methodology for promoting positive actions, behaviors, and respect towards local industry employees, aiming to change the current "social norm" with a powerful message.

KIRKHOF CENTER GRR 100

RESPECT (Find Out What It Means to Me)

Participants attending 12:00 PM - 1:00 PM

Presenters: Kaley Aalderink, Ashley Dore, Drew White-Tebo, Alexandra Wilson

Mentor: Lisa Sisson

One in five Americans have reported experiencing sexual harassment in the workplace with the majority being women. One out of ten people that are eligible to work, are working, or have worked has been in the hospitality industry. With this project called RESPECT, we are aiming to spread awareness of sexual harassment in hospitality workplaces in Grand Rapids, Michigan. From our research and analysis, we are encouraging management to examine training procedures for managers and hourly employees, as well as assessing harassment behaviors. Sexually harassed employees often times leave to work in other industries. By having certified training, this will create a domino effect to spread awareness about sexual harassment. Our campaign attempts to focus on the desired behavior. It is time to put an end to harassment for all men and women; RESPECT.

KIRKHOF CENTER GRR 101

The Respect Effect - Eliminating Harassment in the Workplace

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

Presenters: Sarah Dick, Mary Dreslinski, Allisyn Lee, Will Tomaszewski

Mentor: Lisa Sisson

Eighty percent of female restaurant employees report harassment from customers and co-workers; with over 75% of harassment cases in the hospitality industry never being reported. Inefficiency, high turnover, and poor customer service are all indirect and costly results of the harassment that happens in the daily operations of hospitality businesses. The purpose of this project was to determine the best method to decrease the amount of harassment incidents in the hospitality industry, and raise awareness of the issue with employees and customers. After researching impact on employees, the cost to business, and current business practices and policies, it was concluded that harassment concerns could best be avoided by creating a research-based anti-harassment program that includes clear policy and data analysis, safe reporting techniques, extensive training, and a branded awareness marketing campaign.

KIRKHOF CENTER GRR 102

Weight-bearing vs Active Prone Hip Rotation Range of Motion

Participants attending 1:00 PM - 2:00 PM

Presenter: Melissa Barton

Mentor: Heather Gulgin

Introduction: Hip rotation range of motion (ROM) is usually measured in a non-weight bearing (NWB) status, however, we participate in sports activities when in a weight-bearing (WB) condition. Since measuring in a WB status may be more relevant, the purpose of the study was to compare WB hip rotation ROM measures with a NWB active, prone (AP) measure. Methods: 112 participants (19.3 ± 1.4 yrs, 174.0 ± 11.9 cm, 73.0 ± 12.6 kg) had bilateral hip internal rotation (IR) and external rotation (ER) measured in both WB and NWB conditions. Paired t-tests were used to test for significant differences with an alpha of ($p < .05$). Results: WB and AP measures were significantly different from each other for IR and ER. AP measures were greater than WB measures for IR while the opposite was found for ER. Conclusions: Hip rotation ROM peak values differ significantly between the two measurement methods.

KIRKHOF CENTER GRR 103

Fueling Today's Business with Yesterday's Phone Call

Participants attending 3:00 PM - 4:00 PM

Presenter: Kari Johnson

Mentor: John Gabrosek

A key project of mine as an intern at Crystal Flash in Grand Rapids, MI, has been to analyze and draw conclusions from their large collection of phone data. At Crystal Flash, one of our main goals is to delight the customer. This is something we can achieve through several operations of the business, including their experiences when they call us. We use a Cisco phone system, which can automatically direct calls based on area codes, customer history, and other key components. Our phone system outputs hundreds of metrics for each phone call. It is my job to analyze the mass of data from our phone call history and determine useful information for the stakeholders of the business. My findings will have the potential to adjust staffing in order to optimize Customer Service Representative scheduling, adjust the automated phone trail, and give key insights as to what the customer wants.

KIRKHOF CENTER GRR 104

Timing of Breeding in Tree Swallows From 1993-2018

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

Presenters: Melissa Baughn, Jared Laughlin, Nathaniel Wagner

Mentor: Michael Lombardo

Egg laying dates have advanced in songbird species in North America and Europe over the last several decades. These earlier egg laying dates have been associated with higher temperatures during the egg laying period. We studied the timing of egg laying in Tree Swallows breeding on the GVSU Allendale campus between 1993-2018. Each year we recorded the onset of egg laying and temperatures during the months of April-June. We found that the overall mean onset of egg laying has advanced by 3.25 days. The average May temperatures, the egg laying period for most birds, increased by 3 degrees C. Although mean first egg dates got earlier, only 21% of the variation in first egg date was accounted for by yearly mean May temperatures. Our results align with other studies that suggest the advancement in mean first egg date in Tree Swallows is affected by increasing spring temperatures, but other variables likely affect the timing of egg laying and need to be explored further.

KIRKHOF CENTER GRR 105

Hamajang: Language Ideology and the Misrepresentation of Hawai'ian Pidgin on Reddit

Participants attending 3:00 PM - 4:00 PM

Presenters: Hannah Hodges, Courtney VanHorn, Afton Walker

Mentor: Kathryn Remlinger

Although Hawai'ian Pidgin is spoken by at least fifty percent of native Hawai'ians and was recently recognized as an official language by the U.S census, there is still considerable stigmatization surrounding Hawai'ian culture and language. Many still regard Hawai'ian Pidgin as slang, despite it having all the features of a fully developed language. Through careful research and observation of comments and posts on the social media site *Reddit*, we have found that Hawai'ian Pidgin is often seen as an uneducated form of slang and is discouraged within community and institutional systems. This reflects a larger language ideology that Hawai'ian Pidgin is a substandard form of English and should not be used in formal settings.

KIRKHOF CENTER GRR 106

Effects of Nonylphenol on Crayfish Molting Hormone

Participants attending 1:00 PM - 2:00 PM

Presenter: Collin Trainor

Mentor: Daniel Bergman

Nonylphenol (NP), a surfactant, shows an affinity for estrogen receptors, hence its classification as an endocrine disruptor and potential danger to reproductive success. NP accumulates in aquatic environments and can lead to reduced molting. As molting is triggered by ecdysone release or inhibited by molt inhibiting hormone (MIH) release, this decrease in molting could be attributed to interference with either aspect of this endocrine controlled system. Increases in MIH or decreases in ecdysone are potential mechanisms for delayed or diminished molting. However, changes in the concentrations of these hormones are not the only possible site of interference as competitive receptor binding inhibition could change molting frequency. We hypothesize that NP will disrupt the molting hormone signaling pathways. To test this hypothesis, we quantified hormone concentrations in the hemolymph and receptor expression in gonad tissue during nonylphenol exposure.

KIRKHOF CENTER GRR 107

The Effects of Climate Change on *Carex aquatilis* and *Eriophorum angustifolium* in Atkasuk, Alaska

Participants attending 10:00 AM - 11:00 AM

Presenter: Nicole Foy

Mentor: Robert Hollister

The observation of the effects of climate change on the Arctic are of global significance. Since 1996, students have been monitoring plots of tundra under normal conditions along with a warming experiment that provides insights on growth and flowering in response to temperature in northern Alaska. In the summer of 2018, experiments were conducted to focus on the sedge species *Carex aquatilis* and *Eriophorum angustifolium*. Measurements were taken on leaf length, the number of flowers, temperature, and the overall greenness of the plot. The results show that plants respond to warming with increased growth which corresponds with an increased greening at the plot level. These observations suggest that the greening trend observed across the Arctic may be explained by increased growth of graminoids during warm periods.

KIRKHOF CENTER GRR 108

School-Age Children's Experiences of Cyberbullying: Links to Empathetic Ability and Familial Burden

Participants attending 11:00 AM - 12:00 PM

Presenter: Alexis Godfrey

Mentor: Naomi Aldrich

Our study examined intergenerational relationships between bullying, victimization, and empathetic abilities in a sample of 7- to 13-year-olds and their mothers. As part of a larger study on bullying aggression, 51 school-age children (7y; 2m – 10;6; 49% girls) and 50 early adolescents (10; 7 – 13;11; 50% girls) and their mothers participated. Children completed a victimization/bullying questionnaire (Campfield, 2008) and mothers completed assessments of their child's and their own empathetic abilities, a measure of their own previous experiences with bullying, as well as their child's strengths and difficulties. Our results call into question the early impact of cyberbullying, intergenerational relationships for peer victimization and the role of empathy in this association. Further research is warranted to investigate children's experiences of cyberbullying well before they are introduced to anti-cyberbullying campaigns in middle school and high school.

KIRKHOF CENTER GRR 109

Increasing Awareness of Food Insecurity Among College Students

Participants attending 9:00 AM - 10:00 AM

Presenter: Alison Hige

Mentor: Barbara Hooper

Increasing collegiate education costs results in students today facing greater financial stress. As a result, students have to make difficult choices about how to allocate their monetary resources. Sometimes, students prioritize educational costs over nutrition and health necessities, impacting an individual's ability to obtain adequate food resources. The purpose of this project was to explore the prevalence and impact of food insecurity among college students. The project included conducting a literature review yielding 26 pertinent articles from the keywords "food insecurity" and "college students." Food insecurity affects a student's physical and mental health, along with negatively impacting their scholastic abilities. This research was used to write a resolution focused on increasing awareness of food insecurity, including ways to implement and promote change relating to the topic. The resolution was then presented at the National Student Nurses Association's annual convention.

KIRKHOF CENTER GRR 110

Weight-bearing versus Active Prone Hip Rotation Range of Motion

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

Presenters: Jacob Anderson, Melissa Barton, Dalton Peyton, Lindsey Remski

Mentor: Heather Gulgin

Introduction: Hip rotation range of motion (ROM) is usually measured in a non-weight bearing (NWB) status, however, we participate in sports activities when in a weight-bearing (WB) condition. Since measuring in a WB status may be more relevant, the purpose of the study was to compare WB hip rotation ROM measures with a NWB active, prone (AP) measure. Methods: 112 participants (19.3±1.4 yrs, 174.0±11.9 cm, 73.0±12.6 kg) had bilateral hip internal rotation (IR) and external rotation (ER) measured in both WB and NWB conditions. Paired t-tests were used to test for significant differences with an alpha of ($p < .05$). Results: WB and AP measures were significantly

different from each other for IR and ER. AP measures were greater than WB measures for IR while the opposite was found for ER. Conclusions: Hip rotation ROM peak values differ significantly between the two measurement methods.

KIRKHOF CENTER GRR 111

Understanding High Levels of Distress in Nursing Students: an Innovative and Inter-professional Approach

Participants attending 10:00 AM - 11:00 AM

Presenter: Lauren Rhodes

Mentor: Katherine Moran

The purpose of this study is to describe distress and personality characteristics of nursing and non-nursing students; identify how demands of college affects mental health; whether program requirements affect students differently; and if distressed students would participate in a support program. This study uses a descriptive, longitudinal design with a comparison group to provide a baseline. The Symptom Checklist and test of Big 5 Personality factors were administered via electronic format. The preliminary results from this study indicate that there are significant numbers of students in this population experiencing distress. 194 surveys were collected; 149 were completed and scored. Among the nursing students, as many as 59% had clinically elevated scales on the SCL-90. When compared, nursing students were no more distressed than non-nursing students ($t=-.099$ (df 147)).

KIRKHOF CENTER GRR 112

Effects of Stretching on Vertical Jump and Force Production

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

Presenters: Halle Hoover, Tessa Raber, Jared Varnado, Nathan Winterburn

Mentor: Ross Sherman

Studies have found that stretching prior to exercise decreases force production and performance. The aim of this study was to determine if and to what extent stretching affects vertical jump. Six college-aged students participated in three experimental trials, performed on different days (at least 48 h apart). The trials included a control, static stretching (30 s hold), and PNF stretching (5 s hold, 5 s contraction, 30 s hold). Participants completed a 5-min cycling warm-up prior to each trial. Major leg muscles were stretched following the warm-up. Six jumps were performed immediately following stretch. For three of the jumps a string was tied at knee height to control eccentric contraction prior to jump. Six jumps were performed 15 mins later, imitating the procedure for the first six. 20 seconds were allotted between each jump for recovery. Vertical jump height and force production were measured for each jump. Data will be presented at SSD.

KIRKHOF CENTER GRR 113

Evolution of PEP carboxykinase, an enzyme in the CAM photosynthetic pathway, in Bromelioideae (Bromeliaceae)

Participants attending 2:00 PM - 3:00 PM

Presenter: Hannah Fisher

Mentors: Gregory Brown, Timothy Evans

CAM photosynthesis is a pathway in which plants use an alternative mechanism for carbon fixation than that used in the typical C3 photosynthesis. This pathway was derived several times within Bromeliaceae. In this study,

we examined the evolution and predicted protein structure of PEP carboxykinase (PEPCK), an enzyme in the CAM photosynthetic pathway. Exon regions in the gene that codes for PEPCK were sequenced in 9 species from subfamily Bromelioideae representing both CAM and C3 lineages, and the inferred amino acid sequence for each species was determined. The 3-D protein structure was predicted for each species based on the amino acid sequences and compared to one another. Variation was found within both the DNA and inferred amino acid sequences. Preliminary analyses have also revealed variation in protein tertiary structure within and between CAM and C3 species. This variation will be interpreted in the context of enzyme function and phylogenetic structure within Bromelioideae.

KIRKHOF CENTER GRR 114

Effects of Enclosure Complexity on the Behavior of Lions, Tigers, and Lynx at the John Ball Zoo

Participants attending 1:00 PM - 2:00 PM

Presenter: Isabel Thompson

Mentor: Jodee Hunt

Zoos exhibit wild cat species in enclosures that differ in size & complexity in comparison to natural habitat. These differences influence animal activity and use of space. We studied spatially explicit patterns of behavior of Amur tigers, African lions, and Canada lynx. Our objectives were to master ZooMonitor, an application used to collect of spatial behavioral data, and explore patterns of behavior in relation to enclosure features. We quantified behavior in 30-minute bouts of all-occurrences interval sampling, alternating AM and PM sessions, completing more than 200 total observations. Animals expressed particular behaviors, (*i.e.* sleeping or pacing) in specific locations. Individuals housed within the same enclosure differed in their use of space & features, as did newly introduced compared to well-established individuals. Our study demonstrates that captive animals benefit from enclosure complexity, information that can be used by zoo personnel to improve animal welfare.

KIRKHOF CENTER GRR 115

Music as a Motivator During Exercise

Participants attending 11:00 AM - 12:00 PM

Presenters: Claire Amstutz, Jordan Anderson, Victoria Howcroft, Leslie Semaan

Mentor: Ross Sherman

Background: Studies have shown that there is a correlation between listening to music, decreased reported pain, decreased rate of perceived exertion, increased repetitions, and improved mood. Purpose: This study will test if self-selected music listening is an effective motivator during aerobic exercise by increasing workload and improving mood. Methods: Participants recruited were GVSU students who were experienced runners (ran 2-3x per week for a minimum of 6 months within the past year) underwent a preliminary 1 mile baseline run. Then with a randomized, cross-over design the participants underwent two 1 mile trials on a treadmill while blinded to time, distance, and speed values; one trial with music, one with silence, at least 48 hours apart, with their best effort. Participant's lactate, heart rate, blood pressure, mood, and RPE were tested before and after every trial. Results: The results are being collected and will be presented during Student Scholars Day.

KIRKHOF CENTER GRR 116

Acute Effects of Stretching on Stride Length During Sprinting

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

Presenters: Megan Alwardt, Lauren Feasel, Holly Hermans

Mentor: Ross Sherman

Background: Previous studies have found that both static and PNF stretching hinder performance, however, PNF stretching has been shown to increase stride rate and stride length. Purpose: To determine the acute effect of stretching on stride length over a 40 yard sprint. Methods: Six healthy GVSU students were recruited. There were two stretching interventions prior to testing: static and PNF, as well as a control group, which were allocated using a randomized crossover design. Each stretch was performed bilaterally for 30 seconds. For PNF stretching, the active phase was held for 20 seconds and the passive phase was held for 10 seconds. For static stretching, the stretch will be held at the point of discomfort for 30 seconds. ROM at hip, knee, and ankle were assessed pre-sprint. The sprint was timed using infra-red timing gates, and video recorded to allow assessment of the number of strides over a set distance following the acceleration phase. Results: Data will be presented at SSD.

KIRKHOF CENTER GRR 117

Effect of Dynamic and Static Stretching on Sprint Performance

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

Presenters: Nicole Aultman, Jessica Barrett, Chante Roberts

Mentor: Ross Sherman

Background: Controversy exists in the effectiveness of dynamic stretching compared to traditional static stretching on exercise performance. Purpose: To see if dynamic stretching method results in an improvement in 20 m sprint performance. Methods: Six healthy, college-aged individuals participated in a randomized, cross-over study with three groups (control, dynamic, and static stretching). Prior to testing, two familiarization 20 m sprints were completed. Participants completed a 5 min treadmill warm up with hip, knee, and ankle ROM measured afterwards. Next, two sets of five exercises by 30 s with ROM re-measured. Finally, a 20 m sprint was performed and timed using infra-red timing system. There was at least 48 h between trials. Results: Will be presented at Student Scholars Day.

KIRKHOF CENTER GRR 118

Effects of Exercise on Memory

Participants attending 12:00 PM - 1:00 PM

Presenters: Stefany Angelopoulos, Leigha Filips, Hogan Hayes, Emily Pieczynski

Mentor: Ross Sherman

Background: Previous research has shown moderate to vigorous intensity exercise to be beneficial for short-term memory recall. Purpose: The aim of this study is to show the effects of a single bout of aerobic exercise on short-term memory. Methods: Eight healthy, college-aged individuals engaged in two randomly allocated testing sessions, separated by a minimum of 48 hours, which followed a randomized, cross-over design. Before the two testing sessions began, aerobic intensity was determined by assessing maximum work rate on a cycle ergometer. A memory recall test of 20 randomly displayed words was given to each participant for 2 minutes. After five minutes, they were asked to recall as many words as possible. Participants then either watched TV in a quiet room or exercised at 70% max work rate for 30 minutes. Following this phase, another memory recall test was completed. Results: Data is being collected and will be presented at Student Scholars Day.

KIRKHOF CENTER GRR 119

Pressure Broadening of Carbon Monoxide Infrared Absorption Lines by Neon

Participants attending 3:00 PM - 4:00 PM

Presenters: Tyrese Lillard, Javis Tran

Mentors: George McBane, Stephanie Schaertel

Molecular collisions are of interest because the first step in most chemical reactions is a collision step. The spectral line shape – the shape of plot of amount of light absorbed by a molecule as a function of the wavelength (or inverse wavelength) of impinging light – contains information about energy transfer during collisions. Collisional energy transfer information is useful to theoretical chemists who attempt predictions of reaction rates. Our laboratory has constructed a laser-based spectrometer for measuring the pressure broadening coefficient (PBC) – a parameter that influences the spectral line shape. We made spectral measurements of CO molecules colliding with Ne molecules. The addition of Ne changes the width of the CO infrared absorption line shape. Tracking the width changes in the infrared absorption spectra as Ne gas is added produces PBC measurement. In this poster we report four newly measured PBC coefficients for CO in Ne.

KIRKHOF CENTER GRR 120

Effect of Loaded Jump Warm-Up on Subsequent Vertical Jump Performance

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

Presenters: Molly Booms, Sydney Dykstra, Ashton Greene, Taylor Kehren

Mentor: Ross Sherman

Background: Preload warm up is an emerging technique used by athletes in order to improve vertical jump and force production. Previous studies have illustrated successful results after implementation. Purpose: The aim of this study is to determine if countermovement vertical jump and force production improve after performing loaded jumps. Methods: Eight healthy college aged males and females participated in a cross-over study. Subjects were randomized as to when they jump with 10% or 15% of their body weight in a weighted vest. Vertical jump and force production were measured using the Vertec and the Beast accelerometer, respectively. Prior to the test, subjects performed a 5 minute warm-up on a treadmill. The test involved three sets including baseline, weighted, and non-weighted jumps which were performed during each of the two trials. Three jumps were performed per set with a 2-minute rest between jumps. Results: Data will be presented at SSD.

KIRKHOF CENTER GRR 121

Gendered Discrimination Against Muslim Americans within American Public Spaces

Participants attending 10:00 AM - 11:00 AM

Presenter: Khairun Hasan

Mentors: Julia Mason, Leifa Mayers

Current ideologies surrounding propaganda of the “War on Terror” have caused Muslim Americans to navigate increasingly unsafe public spaces in the U.S. as they continue to face rising discrimination. Gender is intrinsically a part of this discrimination, as gendered expressions of faith and identity often affect the visibility of and social attitudes towards racial and religious minorities. This study will explore this connection by collecting individual interviews with adult Muslim Americans and analyzing their narratives using feminist discourse analysis, allowing further insight into the possible connections that they have to current social and political climates in ways that

challenge dominant ideologies and constructions. This study will build on previous research, which has to an extent been largely quantitative in focus or located outside of the U.S., working to create more nuanced conversations of gender, race, and faith-based discrimination within American public spaces.

KIRKHOF CENTER GRR 122

Capillary Electrophoresis of GAP-43

Participants attending 2:00 PM - 3:00 PM

Presenter: Emily Sund

Mentor: Andrew Lantz

GAP-43 is a protein associated with nerve growth, involved in axonal and dendritic filopodia induction, and found in the frontal cortex and hippocampus. Due to its involvement with nerve growth and location in areas of the brain associated with memory, it is believed to be linked to Alzheimer's. Current research is focused on whether the ratios of the phosphorylated versions can indicate early onset Alzheimer's. Here we present the development of a capillary electrophoresis-based method to separate and identify the phosphorylated and non-phosphorylated versions of GAP-43. Capillary zone electrophoresis was used to determine the isoelectric points of GAP-43. Capillary isoelectric focusing was attempted to isolate the phosphorylated forms of GAP-43, however focused zones for the protein isoforms have not yet been achieved. Further method development is ongoing to determine the purity of the protein being used, value of the protein pI, and optimal isoelectric focusing conditions.

KIRKHOF CENTER GRR 123

Comparison of Maxillary and Mandibular Dental Topographical Features in Chiropterans and Primates

Participants attending 11:00 AM - 12:00 PM

Presenters: Bo Collins, Mark Hosea

Mentor: Laura Stroik

The mammal community in Balta, Peru encompasses a variety of dietary regimes, and this variation is present within chiropterans (bats) and primates. 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 both maxillary and mandibular second molars in a subset of the Balta community to determine if dental topographical values were similar between occluding molar pairs. Casts of second molars were microCT-scanned, and relief index, a dental topographical measure, was 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.

KIRKHOF CENTER GRR 124

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

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

Presenters: Brandy Curtis, 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 and characterize molecules that inhibit the ADC enzyme, it's important to investigate the various interactions between the inhibitors and the active site residues. To accomplish this, we have characterized the structure/function relationship with some boronic acid transition state inhibitors (BATSI), as well as the antibiotic ceftazidime, bound in the active site of ADC-7. These studies will contribute to the characterization of novel inhibitor compounds that can help in the alleviation of antibiotic resistance in *Acinetobacter baumannii*.

KIRKHOF CENTER GRR 125

**Assessment of Toxicity of Biofilms from Microplastics Incubated in Muskegon Lake:
Pilot Studies with *Caenorhabditis elegans***

Participants attending 2:00 PM - 3:00 PM

Presenter: Sophia Voza

Mentor: Babasola Fateye

Microplastics are becoming more abundant, providing a new growth environment in water for microorganisms and pollutant chemicals that adsorb to plastics. We asked 2 questions: (1) How does the biofilm eluted from different plastics -- polypropylene, polystyrene, and polyethylene -- affect the growth and development of *Caenorhabditis elegans* larvae? (2) For elutriates in which toxicity was observed, do metals play a role in the toxicity? Specifically, if a non-toxic concentration of ethylenediaminetetraacetic acid (EDTA) is added to elutriates, does toxicity decrease? A synchronous age culture of *C. elegans* was obtained and then plated in a 96 well microtiter plate incubated at 20 degrees C. Life span was assessed based on mobility with an inverted microscope as well as size analysis with ImageJ. Initial results show that some elutriates from samples obtained from the water column were less toxic to the development of *C. elegans* than samples from within the water column.

KIRKHOF CENTER GRR 126

Sex Work as a Human Right: Global Responses to the Decriminalization Movement

Participants attending 2:00 PM - 3:00 PM

Presenter: Gabrielle Lewis

Mentor: Julia Mason

In 2015, Amnesty International voted to officially adopt a policy that supports the decriminalization of sex work affording more rights and protections for those in the profession. This poster analyzes the dominant and missing portrayals of sex workers in the discourse around the 2015 Amnesty International decision, in order to understand the deeper meanings of why certain experiences are included or excluded in discussions and to be able to identify how a person's gender and sexuality may add to their inclusion or exclusion. The data analyzed includes official statements from NGOs both for and against the policy, as well as newspaper articles discussing the policy. This will provide a wide range of perspectives that reveal what the dominant sex work narratives are and whose experiences are being overlooked. This supports a richer understanding of society's conceptualizations of sex and gender by analyzing prominent discourses regarding sex work and human rights.

KIRKHOF CENTER GRR 127

Lower Limb and Core Muscle Activation Following a Two Week Instability Training

Program

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

Presenters: Emilie Andrews, Elizabeth Grobbel, Taylor Harry, Rachel Wechsler, Nathan Winterburn

Mentor: Stephen Glass

Falls due to instability is a common problem among elderly and frail populations. Instability is sometimes due to an inability to rapidly activate muscle to compensate for balance shifts, especially following injury or surgery. The purpose of this research study design proposal is to examine the effects of instability training on rapid, compensatory muscle activation during a perturbation challenge. We will present a design for an initial perturbation challenge, with a two week (3 d/week) training program using a 25 pound, water-filled instability tube. Pre-post testing will examine ground reaction forces using a force plate and muscle activation (gastrocnemius, vastus lateralis, and paraspinal muscles) using surface electromyography. Possible design approaches will be discussed.

KIRKHOF CENTER GRR 128

Why Are Southern Accents Looked Down Upon?

Participants attending 3:00 PM - 4:00 PM

Presenters: Haven Born, Taylor Stachowski, Francesca Vitale

Mentor: Kathryn Remlinger

This study examines how people's values, intellect, socioeconomic class and accent variations affect how people view southern dialects in the United States, as well as what it means to have a southern dialect. We will explore through the use of Reddit how society's view of the South relates to dialects and language. Preliminary findings show the power that an accent holds over how we view and judge speakers of southern dialects. We will uncover what people think 'standard english' is and ways that southerners don't speak what many people consider 'standard'. The distinctions that make a southern accent different from other dialects gives southerners their own sense of identity, as well as their own set of challenges. Other findings will expose the stereotypes that southern accents hold. Our study will examine the ideas of what it means to have a southern accent and people's views about southern accents.

KIRKHOF CENTER GRR 129

The Effect of Melatonin on Dopamine Release in the Caudate Putamen

Participants attending 1:00 PM - 2:00 PM

Presenter: Jessica Wyn

Mentor: Eric Ramsson

Melatonin is the primary hormone governing regulation of the Circadian Rhythm. Currently, few studies have investigated the effect of melatonin on neurochemical signaling in the brain. To investigate the effect of short term melatonin exposure on dopamine release, mouse brain slices were exposed to varying doses of melatonin and dopamine release events were elicited and recorded via Fast Scan Cyclic Voltammetry for an hour exposure and hour washout period. The Caudate Putamen was targeted as it is a dopaminergic center important in movement regulation, learning, and memory. A significant decrease was observed at the 50M and 100M dosages and was maintained through the washout period and repeated with varying waveforms to determine that the effect was caused by melatonin. Due to the importance of sleep in the renewal and fortification of learning and memory pathways, these results speculate whether melatonin may play a role in regulating these processes in the Caudate.

KIRKHOF CENTER GRR 130

Testing the Effects of PARK9 Knockdown in *Drosophila melanogaster*: A Putative Model for Parkinson's Disease

Participants attending 11:00 AM - 12:00 PM

Presenter: Erin Reasoner

Mentor: Sok Kean Khoo

Parkinson's Disease (PD) is a progressive, neurodegenerative movement disorder characterized by a loss of dopaminergic (DA) neurons. Most cases of PD are idiopathic; however, an estimated 5-10% of cases are linked to familial mutations. This includes recessive mutations in PARK9 (ATP13A2), which have been associated with early-onset PD. While prior research has identified PARK9 as being crucial to cation transport, the mechanism through which loss-of-function induces motor deficits is unknown. In this study, we sought to validate a knockdown of PARK9 in *Drosophila* as a model for a PD-like phenotype. *Drosophila* from two PARK9 RNAi lines were subjected a five-week climbing assay, and survival analysis was conducted over a 60 week period. Our data indicates that one of the PARK9 RNAi lines induced a significant motor deficit. PARK9 knockdown was found to have no effect on *Drosophila* lifespan. Future studies will focus on connecting observed motor deficits with DA neuronal degeneration.

Oral Presentations, Abstracts & Schedule

Beginning at 9:00 AM

KIRKHOF CENTER 1104

Slowing the Spread of Asian Carp in United States Watersheds

Presenter: Kolton Kavanagh

Mentor: Griff Griffin

I will be tracking the spread of Asian carp in the United States watersheds since the 1970's and highlighting the spread to understand their rate of spread and why the species is bad for the ecosystem. Asian carp are an invasive species that wreak havoc on any ecosystem that they are introduced to by consuming phytoplankton and zooplankton, ultimately outcompeting other fish species. The purpose of this research is to help illustrate ways that fisheries managers could effectively reduce the population of Asian carp in different types of watersheds. After compiling the various data, speaking with other scientists around the country, and comparing which forms of deterrents work and which methods are less effective, the data from various management techniques all around the country will be collected to show how effective removal of Asian carp have been for fisheries managers in the past.

KIRKHOF CENTER 1142

The Benefits of Intergenerational Living Programs

Presenters: Rebecca Bannasch, Ashley Gruppen, Kati Harris, Samantha Rothe, Emily VanNuil

Mentor: Dawn De Vries

This presentation will explore the many benefits of implementing intergenerational living arrangements among older adults and college age students. It will focus on ways that these arrangements can improve an individual's social, emotional, physical, and cognitive domains.

KIRKHOF CENTER 2201

Who is a Mexican? Afro-Mexicans Reclaim their Place within the Nation-State

Presenter: Kendra Garcia

Mentor: David Stark

The research examines the field of Afro-Mexican history, in particular how the field has evolved, how Afro-Mexicans have been marginalized and reclaimed their place within the nation. Three questions guide my analysis: one, how and why were Afro-Mexicans rendered invisible in the historiography; two, what prompted renewed interest in Afro-Mexicans and three, what have they done to raise awareness or fight for inclusion? My central argument is around how the concept of *mestizaje* was used to marginalize Afro-Mexicans. As such, the gap in the research is due to the erasure of Afro-Mexicans from national identity, and general emphasis on *mestizaje* in the period after the Revolution. A resurgence in the field began as a result of a growing interest in comparative history, the era of post-emancipation, and a small segment of the Afro-Mexican population becoming involved in politics beginning in the 1980s which led to this renewed interest in the lives of contemporary Afro-Mexicans.

KIRKHOF CENTER 2259

Journal/Article Credibility Analysis

Presenters: Kourtney Dobbin, Mitchell Hoezee

Mentor: John Gabrosek

We are working with Kim Ranger who is a Faculty Librarian at Grand Valley State University (GVSU). Kim wants to get a better understanding on how students' reading comprehension and learning skills are being applied at GVSU. She administered 122 surveys to Grand Valley students to test their analytical skills. We will test the difference in survey results between different class sections and different class semesters in the *Research Basics for Advertising and Public Relations* (CAP 115) course. We are analyzing both qualitative and quantitative data. There are open-ended/free response answers to explain why the students believe the given article was a credible source. We will be looking for patterns in those open-ended/free response questions to see if students are learning critical thinking skills while attending GVSU.

KIRKHOF CENTER 2266

Outcrossing of a Colorado Wildflower With Mixed Mating Systems May Lead to Outbreeding Depression

Presenter: Kristin Schepke

Mentor: Lauren Carley, Duke University

Despite the negative effects of high homozygosity, many species of flowering plants have evolved to self-fertilize a majority of the time. Understanding whether inbreeding influences fitness will help to shed light on the evolution of mixed mating systems. To address this, we measured trait variation among a panel of 400+ genotypes of *Boechera stricta*, a highly self-pollinating wildflower with mixed mating, in a common garden experiment in the Rocky Mountains. These genotypes represent natural variation in inbreeding coefficient, allowing us to test whether past inbreeding influences fitness components such as growth and fruit production. We also performed controlled crosses among a subset of these genotypes to test whether selfing vs. outcrossing influences seed set. We found that more inbred populations of this species may have higher fitness than outcrossed populations. These results suggest that some highly selfing species may exhibit signs of outbreeding depression when outcrossed.

KIRKHOF CENTER 2270

Non-Invasively Diagnosing Endometriosis: Sonography as a First-Step Detection Method

Presenter: Emily Gross

Mentor: Tatyana Beaves

Endometriosis is a gynecologic disease that affects 200 million women worldwide, occurring when normal endometrial cells are deposited in ectopic locations (Endometriosis Foundation, 2018; Greaves, 2018). Because this can mask as other common conditions, it takes on average of ten years from symptom onset to receive a diagnosis (Seckin MD Endometriosis Center, 2018; Endometriosis Foundation of America, 2018). This time can allow the unchecked disease to proliferate, causing long-term complications such as infertility (Endometriosis Center of America, 2018). While magnetic resonance imaging and laparoscopic procedures provide detailed information for physicians, they can both be expensive rule-out options; therefore, because ultrasound is an affordable, non-invasive, and accurate alternative, this modality can be an effective first-step screening tool for endometriosis.

Beginning at 9:30 AM

KIRKHOF CENTER 1104

Deforestation's Impact on Open Eucalypt Forests in Southern Australia

Presenter: Emily Fritz

Mentor: Griff Griffin

This research examines how vegetation native to Australia's forests reacts to deforestation and the further impact it has on forest composition. Over five weeks, an experimental set of plants grew in a growth chamber mimicking the light and moisture levels of a deforested area, while the control group was grown with those temperate forest conditions. Vegetation may have a myriad of responses to altered conditions, but it is expected that *Eucalyptus neglecta* (Omeo Gum) will react negatively to increased sunlight and lower humidity levels. The seedling data provides insight to what the succession of the forests will be post deforestation, as eucalyptus is an integral part of Australia's ecosystems.

KIRKHOF CENTER 1142

Siblings with Eating Disorders and Therapeutic Interventions

Presenters: Jennifer Bos, Makenzie Fridley, Ellise Kelley

Mentor: Dawn De Vries

There are various genetic and environmental risk factors that have been identified that make an individual more likely to develop an eating disorder, however, there is limited research on interventions used for the recovery process of an eating disorder. Our presentation and literature review focuses on various therapeutic recreation interventions that seek to reduce the symptoms of eating disorders among twins and siblings.

KIRKHOF CENTER 2201

Willow Biomass as a Chemical Feedstock

Presenter: Andrew Freiburger

Mentors: Dalila Kovacs, James Krikke, Erik Nordman

As climate change and anthropogenic pollution compounds, the need for developing a biologically sourced economy (bioeconomy) through sustainable feedstocks for fuel, materials, and consumer goods becomes increasingly necessary. In search of prospective feedstocks, four varieties of shrub willow hybrids, grown at GVSU's Sustainable Agriculture Project (SAP), have been investigated for their potential as a sustainable feedstock. Chemical analyses determined the qualitative and quantitative mineral and extractable content, the % ash and % moisture of fresh mass, the enthalpy of combustion, and the qualities of delignified material. The findings reveal that one species is particularly well-suited for applications in biorefinery, and that all of the willow varieties possess non-trivial quantities of extractable medicinal compounds. In light of these results, willow biomass exhibits noteworthy potential as a sustainable chemical feedstock.

KIRKHOF CENTER 2259

Impacts of Ethical Education on Hospital Employees

Presenters: Lindsey Novach, Stephanie Parker

Mentor: John Gabrosek

How confident are hospital employees with their ability to handle ethical dilemmas? How does an individual's ethical education impact this confidence? These were among the questions provided by our clients for their study on medical ethics. Questionnaire responses were collected from hospital employees from one Italian hospital and one hospital in the United States. These responses included information about demographics, ethical education, and institutional requirements for ethical education. The main goal of the study was to compare this information with the subjects' confidence in their ability to handle ethical situations in the workplace. Our goal as statistical consultants was to assist with visualizing this comparison. Because our clients hoped to eventually complete a more extensive version of their study, we also collaborated to create another sampling plan and questionnaire.

KIRKHOF CENTER 2266

An Analysis on the Activities Used in SWS Courses

Presenters: Megan Genslak, Khadija Mohamed, Hung Phan

Mentor: John Gabrosek

Students at Grand Valley are required to take two Supplemental Writing Skills courses in order to enhance their writing, editing, and communication skills. To analyze behaviors that influence one's writing, two different surveys were administered to individuals who have participated in a SWS course, one to students, the other to faculty. The student survey had students rank the effectiveness of activities used in the course, and how these activities contribute to the overall effectiveness and enjoyment of writing; these activities include peer editing, reading scholarly articles, and constructing drafts. The faculty survey had professors discuss activities done in class and state how many students or sections they taught; these factors may influence the professor's overall enjoyment of teaching the course. We discuss analysis of the data collected as part of this research from the years 2014, 2016, and 2018.

KIRKHOF CENTER 2270

On the Fly Consulting

Presenters: Sage Blunt, Ethan Eslick

Mentor: John Gabrosek

This talk will focus on the experience of two statistical consultants working on a project for the first time. The project is based around *Drosophila* commonly known as fruit flies. The goal is to examine differences between fruit flies with the Delorean mutation. The statistical consulting process is explored from the first meeting with a client to completion of the project. We reflect upon the difficulties and struggles first time consultants are faced with. Multiple statistical techniques and data visualizations are utilized to analyze whether two different genetic crosses of fruit flies will produce eggs that differ in size or development over time.

Beginning at 10:00 AM

KIRKHOF CENTER 1104

A Spatial Analysis of Microplastics in Lake Michigan

Presenter: Brooke Veres

Mentor: Griff Griffin

Plastic is breaking down over time into microplastics, floating in the water column, and entering our food chain. The sources polluting plastic into Lake Michigan and the effects of humans ingesting plastic is unknown. The purpose

of this research is to find which type of microplastic is most abundant in Lake Michigan and where they are most abundant. Data was collected from July 2018 to October 2018. The coordinate location of each water sample, weather/lake conditions, and closest land use was collected while sampling. I recorded the type and number of microplastics in 1/4th of the water sample. The most common plastic present is beads and fibers most likely from sewage and industrial plant discharge. They are most abundant in the tributaries sampled from the southern portion. Additional study will be necessary to find the sources of microplastic pollution, plastic composition, and amount of plastic in the lake.

KIRKHOF CENTER 1142

Veterans with Combat Related Disabilities and Transitioning Home

Presenters: Ashley Carver, Rachael Nietling, Amanda Reeves

Mentor: Dawn De Vries

This presentation focuses on United States military veterans with a combat-related disability and their transition home after deployment. The use of therapeutic recreation interventions with the military member and their spouse were explored to expand knowledge on future treatment interventions for veterans and their families.

KIRKHOF CENTER 2201

Minimal Coprime Labelings of Complete Bipartite Graphs

Presenters: Christian Miller, Elizabeth Ortiz, Maia Wichman

Mentors: Feryal Alayont, Lauren Keough

A graph is a network of vertices connected by edges. A prime labeling of a graph is an assignment of natural numbers to the vertices so that connected vertices' labels have no common divisors, i.e. are relatively prime. For example the label 4 could be connected to the 3 but not to the 6 since 2 divides both 4 and 6. However, for prime labeling a graph with n vertices, you cannot repeat labels and can only use natural numbers less than or equal to n to label. The complete bipartite graph, depending on its size, is a graph that cannot always be prime labeled. This introduced the idea of coprime labeling, where you can use numbers larger than n . A minimal coprime labeling is a labeling where you use the smallest numbers larger than n possible. In this talk, we will explore the minimal coprime labeling of complete bipartite graphs.

KIRKHOF CENTER 2259

Ethno-tourism in China: How the Expansion of Tourism has Benefitted and Harmed Ethnic Minorities in Yunnan

Presenter: Kahrlee Kozan

Mentor: Meghan Cai

The Chinese province of Yunnan is extremely ethnically and culturally diverse, home to 26 of the 56 officially recognized ethnic groups. Through tourism, Chinese ethnic minorities in Yunnan have gained more job opportunities and an improved style of life through modernization and an increased income. However, some of these ethnic minority people feel that their culture is being diluted to commodify and cater to the audience of tourists. The tourism industry has also caused environmental and sustainability issues, as well as non-ethnic minority peoples taking advantage of local tourism market to gain a profit. These concerns have created tension between ethnic minorities, the government, non-ethnic minority people who are not tourists, and tourism companies. This paper explores the advantages and disadvantages that ethno-tourism has brought to the province and people

of Yunnan and how they may impact the preservation of ethnic cultures and their cultural heritages.

KIRKHOF CENTER 2266

Forster at the Symposium: The Reception of Platonic Philosophy and Classical Sexual Schemata in E.M. Forster's *Maurice*

Presenter: Meghan O'Neill

Mentor: David Crane

In this paper I seek to elaborate on Forster's allusions to classical texts within *Maurice* and argue that the characterization of homosexual figures in his work are predicated upon the reception of classical literature and philosophy, which are used to historicize the moral and aesthetic discourse of the narrative. Although Forster's own identity and experience informed his writing in respect to narrative, the constructions of homoeroticism in *Maurice* are not derivative of the constructions of his contemporaries, but rather the archetypes, philosophy, and sexual schemata reflected within classical literature, namely Plato's *Symposium* and *Phaedrus*. This reckoning between social ideals and constructions of sexual identity in the modernist period is what characterizes *Maurice*, and the allusion to classical thought as a means of moralizing homoeroticism represents a transhistorical relationship between classical and early modern models of sexuality, agency, and orientation.

KIRKHOF CENTER 2270

Impact of Activity-Based Learning on Students' Attitudes Towards Mathematics

Presenters: Tim Jockusch, Madeline Miller

Mentor: John Gabrosek

The purpose of this study is to evaluate the effectiveness of activity-based learning for improving students' attitudes towards mathematics. The subjects in the study were students in discrete mathematics and linear algebra classes over the course of six different semesters. The subjects took identical pre- and post-tests consisting of 24 mathematical belief questions. We investigate how students' mathematical beliefs changed from the pre-test to post-test, and whether the number of math classes students took before the class has an impact on the change.

Beginning at 10:30 AM

KIRKHOF CENTER 1104

Determining Site Suitability for Trees to Increase Bank Stabilization

Presenter: Megan Richardson

Mentor: Griff Griffin

Establishing trees in bare areas along an open channel storm water drain is a best management practice (BMP) for bank stabilization. Having a stable bank reduces runoff, provides erosion control, and provides a multitude of other ecosystem services. The purpose of this research is to create a model that will predict habitat suitability for four species: White Cedar (*Thuja occidentalis*), Sweet Gum (*Liquidambar styraciflua*), Birch (*Betula*) and Larch (*Larix*). The soils of the study area vary in type and texture and are the most important biophysical factor to consider for tree site suitability. Considering anthropogenic factors and the use of a suitability model will give managers the tools needed for selecting where to plant a species of tree. Planting trees in their most ideal conditions will result in a greater rate of survival, allowing for the most effective amount of bank stabilization.

KIRKHOF CENTER 1142

Mindfulness as an Intervention: For Mothers with Postpartum Depression and Low Socioeconomic Status

Presenters: Haley Adams, Elena Brownell, Kadison Klausing, Madison Wegener

Mentor: Dawn De Vries

Postpartum depression is a mental disorder which occurs during and/or after pregnancy. This literature review and presentation emphasizes the social issue around the lack of available health-related services to families with low socioeconomic status. The purpose of this study is to supply alternative resources for families to treat symptoms of postpartum depression through cost-effective methods that can be provided by a Certified Therapeutic Recreation Specialist. Mindfulness can be used as a holistic intervention to treat the symptoms associated with PPD. Mindfulness incorporates different techniques such as stress management, aroma therapy, and relaxation to provide effective and affordable treatment.

KIRKHOF CENTER 2201

Prime Labeling of Flower and Sunflower Graphs

Presenters: Michael Baas, Joseph Kendrick, Brenna Skinner

Mentors: Feryal Alayont, Lauren Keough

A graph with n vertices can be prime labeled if we can assign each of its vertices a distinct positive integer not exceeding n in such a way that the labels of each pair of adjacent vertices do not share a common factor other than one. We will explore prime labelings of flower and sunflower graphs which build off of wheel graphs. A wheel graph includes a middle vertex that connects to an outside ring of vertices. A flower graph is like a wheel graph except that it also includes pendant vertices above the wheel that also connect to the middle vertex. A sunflower graph is the result of an outer layer of pendant vertices connecting to two adjacent vertices that are connected to one another in addition to a middle vertex. We will present in what ways flower and sunflower graphs can or cannot be prime labeled.

KIRKHOF CENTER 2259

Teacher Retention in Michigan Charter Schools

Presenter: Allison Donahue

Mentor: Jeffrey Kelly Lowenstein

The topic of School of Choice and charter schools has heated up in the public and policy-making spheres in recent years, especially here in Michigan. Michigan is home to Secretary of Education Betsy DeVos, a staunch advocate for the School of Choice movement. Thanks in part to her advocacy, Michigan has the fifth highest enrollment of students in charter schools nationwide. While the state is struggling to fill classrooms with teachers in all of their schools, charter schools are particularly hard hit with the issue of teacher retention and turnover. Through analyzing policy and publicly available data, this study examines the retention rates of teachers in both charter and standard public schools, the potential reasons for the high turnover, and the impact it has on the students.

KIRKHOF CENTER 2266

Femininity and the Body: A Study in Collaborative Poetry

Presenters: Emily Ferrera, Maria McKee

Mentor: Amorak Huey

Writing at its roots is collaborative; oral poetry passed on from one mind to the next has shaped some of the first known pieces of writing. From September to December 2018, Emily Ferrera and Maria McKee began individually drafting poems and sending them to each other via email to edit. Following the first revision, the poems were placed in a shared document referred to as the Life Yard. Their primary goal for this project was to practice the ideology that the roots of the poetry we study today, collaborative poetry, is poetry at its most intimate. As they wrote, a common theme of femininity and the human body and its physical connections to nature and personal relationships developed. Sharing their intimate writing with each other signified the release of ownership over their own personal ideas, which allowed for an enriching writing experience where they were able to push each other's writing for the best interest of the poem.

KIRKHOF CENTER 2270

Dogbreeding at Paws With A Cause

Presenters: Justin Green, Miranda Inosencio, Michael Palazzolo, Julia Smelt

Mentor: John Gabrosek

Paws With A Cause is a Michigan based non-profit organization that custom-trains assistance dogs for clients with disabilities. Paws has many different areas of expertise including the dog journey, client journey, and post-match journey. The dog journey consists of breeding dogs for puppies, raising the puppy, vet care, advanced prison training, and custom training. The client journey consists of qualifying to apply, applying, getting approved, and determining what assistance is needed. After the client and dog are matched Paws assists with in-home support for the client and dog. We will be analyzing data collected over 15 years to determine how many female breeder dogs are needed to produce an appropriate number of puppies for future need. We will also be comparing different age groups of the female breeder dogs for variables that could play a factor in puppies produced.

Beginning at 11:00 AM

KIRKHOF CENTER 1104

Drones: The Newest Tool For Wildlife Research

Presenter: Sarah Daniels

Mentor: Griff Griffin

This literature-based study investigates research techniques available thanks to new technological developments: unmanned aerial vehicles, dubbed "drones". With the help of a bird's eye view, wildlife researchers can track animals through dense forests and monitor whales in oceans. With the use of drones, researchers can gain information about population dynamics, behavior, hunting and poaching practices. This study considers worldwide research studies of wildlife, and the effects of drones on these species. Drones will continue to become more accessible and advanced. This project sheds light on their monitoring abilities, as well as their impact.

KIRKHOF CENTER 1142

Use of Assistive Technology to Facilitate Employment for Persons with TBI

Presenters: Amanda Ampey, Kathryn Williams

Mentor: Dawn De Vries

Traumatic Brain Injury (TBI) is defined as "a disruption in the normal function of the brain that can be caused by a bump, blow, or jolt to the head, or penetrating head injury" (CDC, 2017). Recovery is most likely to occur for

individuals with mild traumatic brain injury (mTBI), but these individuals are often “left with disabilities that impair their ability to fulfill their work, family, or school responsibilities” (Vos and Diaz-Arrastia, 2014, p. 5). According to the Bureau of Labor Statistics, in 2017 the unemployment rate for persons with a disability was recorded to be 9.2% (2018). In order to promote the full inclusion and participation of persons with TBI into the workplace, proper intervention will be essential. This study will seek to address the obstacles to employment of individuals with traumatic brain injuries and will assess the influence of assistive technology in facilitating employment opportunities.

KIRKHOF CENTER 2201

East Timor and Haiti: The Challenges of Outside Forces in Increasing State Capacity

Presenter: Sophia Bagnall

Mentor: Thomas Walker

This project explores the complex nature of state building by international actors. I aim to show the difficulties in establishing stability that foreign interventionists face. I ask whether multi-state intervention is more effective than single state intervention. With fewer concerns for loyalty, organizations such as the United Nations are better able to adapt to the needs of the individuals within the state. These needs include internal security, economic stability, and a government that incorporates all aspects of culture and society. I draw from two case studies, the United Nations intervention in East Timor and the United States intervention in Haiti. The United Nations effort, despite facing several challenges, has proven to be a relative success in stark contrast to the result in Haiti.

KIRKHOF CENTER 2215/2216

Impacts, Vulnerabilities, and Adaptations/Mitigations to Climate Change on Coral Reefs off the Northeastern Coast of Australia in the Coral Sea

Presenter: Hannah Randall

Mentor: Elena Lioubimtseva

We will be examining the issue of climate change-induced impacts, vulnerabilities and adaptations to coral reef health off the Northeastern Coast of Australia in the Coral Sea. We will be discussing specific impacts of climate change on reefs, including coral bleaching, the extent of reef vulnerability to climate change and various mitigation processes, such as some forms of coral restoration. Our methodology will include utilizing several software technologies such as ERDAS Imagine, ArcGIS, and MAGICC-SCENGEN. We will research numerous scholarly, peer-reviewed sources and previous studies regarding coral bleaching and the reasoning behind this phenomena, zooxanthellae algae, coral polyps, growing and planting coral fragments, etc. Coral reefs are especially important to ocean ecology and the overall health of our planet. These ecosystems are biodiversity hotspots. They act as habitats for marine life and they protect coastlines from wave action, erosion, and weather damage.

KIRKHOF CENTER 2259

Linguistic and Interactional Complexity in Virtual Fields

Presenter: Alexander Norris

Mentor: Michael Wroblewski

Anthropological approaches to language consider its embeddedness in various social, sociohistorical, temporal/spatial, and linguistic contexts, or “fields”. However, there is a paucity of literature regarding language use in online fields. This study uses audio/video-recordings of conversational data between members of the Xbox Live community and draws from Hanks’ (2005) concept of “deictic field”, in which expressions such as “here” and “there”

are used to spatialize both agents and objects relationally. I examine the complex deictic practices in a specific community of gamers and how gamers navigate communication in an interconnected web of divergent deictic fields, all of which shape interactional contexts. I argue that Hanks' "relevancy structures" helps explain how gamers are able to differentiate discursive practices between interrelating fields. Moreover, the collaborative interactional context produced consists of layers of meaning that are unique to virtual gaming worlds.

KIRKHOF CENTER 2266

The Wonderful World of Motion Graphics

Presenter: Kayla Hardy

Mentor: Julie Goldstein

There is so much more to the world of animating than the few things we may see at the movies or on our computers. While 2D/3D animation and CGI make up a lot of the media we see today, but there is another world of animation through motion graphics. Open up your phone. That small animation is the work of a motion graphics artist. More things in your daily life are composed of motion graphics than you may think. That is what this presentation will explore- what motion graphics does in the everyday world.

KIRKHOF CENTER 2270

Total Prime Labelings of Graphs

Presenters: Emeline Root, Cian-Kyler Young

Mentors: Feryal Alayont, Lauren Keough

A graph is a set of vertices, typically drawn as dots, connected by edges, typically drawn as line segments that connect the dots. To numerically label a graph, each vertex and edge is assigned a natural number. We are interested in total prime labelings of graphs. A total prime labeling of a graph is a labeling of each vertex and each edge with natural numbers from 1 to the number of edges plus the number of vertices, such that:

1. the labels of every pair of adjacent vertices are relatively prime, and
2. for each vertex of degree at least 2, the labels of every pair of incident edges are relatively prime.

Previous results have proven that all paths, all comb graphs, all even cycles, all stars, all complete bipartite graphs with one partition having two vertices, and all wheels have a total prime labeling. We explore whether other graph families have total prime labelings or not.

Beginning at 11:30 AM

KIRKHOF CENTER 1104

Educational Content in Urban Units Compared to Rural Units Managed by the National Park Service

Presenter: Sierra Warrner

Mentor: Griff Griffin

There is a lack of education when it comes to environmental issues in the United States. The National Park Service is taking action by implementing educational programs at their parks. The purpose of this report is to perform a comparative analysis of the National Park Service's science education programs in urban areas compared to rural areas. The analysis will include a spreadsheet with locations, age ranges, environmental topics, and student activities that occur in the educational program. Education programs in urban areas will be compared to rural areas

to better visualize how the National Park Service uses locations to determine the content taught in their education programs.

KIRKHOF CENTER 1142

Peer Education and Inclusion

Presenters: Christopher Baker, Kelsy Hoemke, Osta Thomson

Mentor: Dawn De Vries

The intent of this study is to find out how peer education can improve opportunities for the inclusion of students with disabilities. Examining research that compares students with disabilities within an inclusive elementary classroom to students not in this setting, we seek to demonstrate the benefits that can occur in cognitive and social skills, and how these benefits provide increased opportunity outside of the classroom.

KIRKHOF CENTER 2201

Representation of Mental Illness in Cinema

Presenter: Audrey Czachorski

Mentor: Kim Roberts

With suicide being in the top ten leading causes of death in the United States, mental illness has become a pressing issue in our society. Contributing to this crisis is the portrayal of mental illness in a negative light. Not only is there little meaningful representation, mentally ill characters are often portrayed as dangerous and violent. This can provide the public with an inaccurate view of mental illness, and negatively contribute to the internal struggle of those with mental illness. This presentation will explore how the representation of mental illness impacts society and the mentally ill, and how filmmakers can influence future attitudes and perceptions of mental illness.

KIRKHOF CENTER 2259

Creation of a 3D Animation Machine

Presenter: Charles Billingsley

Mentor: Julie Goldstein

In 1834 William George Horner invented one of the first animation technologies called a zoetrope. It consisted of a drum in which a strip of paper containing images of different stages of movement would be placed. The drum would then be spun, and when looking into the cuts, the illusion of movement would be created. While these devices were stunning to crowds when they were invented, they are nothing short of an amusing toy to the audiences of today. Through my senior project, I sought to bring back the amusement and joy produced by these original animation devices. I merged the modern technologies of 3D printing, microcontrollers, and electric motors with the now antique technology of the zoetrope, to create a three-dimensional self spinning zoetrope experience that brings excitement back into the technology that was so integral in the formation of animation as we know it today. This presentation will go over my creative process and will include a demonstration of the final product.

KIRKHOF CENTER 2266

MiSTEM Network Questionnaire Design and Execution

Presenters: Stephen Bennett, Derik Gretzinger

Mentor: John Gabrosek

We discuss our process in creating a measurement tool in collaboration with the MiSTEM Network. Currently, there is no baseline data measuring attitudes and knowledge about STEM fields in Michigan. We describe the development of a questionnaire with the purpose of measuring these constructs. This questionnaire will be administered to community leaders and educators in the greater Grand Rapids area. Our presentation consists of the process surrounding designing this questionnaire. This includes areas such as question design, writing response options, categorizing and organizing questions, and designing the visual layout of the survey. We also discuss the supplemental documents that we provided such as the IRB submission form, letter of confidentiality, data security suggestions, and data analysis plan. We then describe planning the survey administration. Finally we discuss how our project fulfills our client's main goal of improving student interest and achievement in STEM fields.

KIRKHOF CENTER 2270

Benefits of a Stigma Free Community

Presenters: Kelly Arndt, Daniel Weglarz

Mentor: John Gabrosek

Extended Grace is a nonprofit organization creating a stigma free community located in Grand Haven, Michigan. They provide opportunities for forming relationships and offering programs and events to nurture, educate, and inspire. We were tasked with analyzing the impact Extended Grace has on adults with mental health problems, disabilities, and addictions. We also determined the overall attitude towards the provided space and the overall effect of adverse childhood experiences on those participating in Extended Grace.

Beginning at 12:00 PM

KIRKHOF CENTER 1104

Comparison of Wetland Coverage and the Influence of Agricultural and Urban Development Since 1800 in Michigan

Presenter: Nicholas Hart

Mentor: Griff Griffin

This project analyzes the approximately six and a half million-acre loss of wetlands across Michigan and compares it to the influence of agricultural and urban area expansion. I used ArcMap to create maps that sequence the expansion of agriculture and urban areas in Michigan over time. Data used for these comparisons were from various ArcMap and library databases. This study is also looking at certain time periods from the past two hundred years that had significant impact on wetland loss and degradation. Urban expansion enhanced the demand for forest products, so logging activity increased. Once land was available for an alternate use, agricultural uses became the most prevalent. I found that the expansion and prioritization of agriculture had the greatest negative impact on wetlands due to field draining and altering the hydrology of the landscape.

KIRKHOF CENTER 1142

Nature-Based Interventions with Children who have Experienced Domestic Violence

Presenters: Mackenzi Krieger, Kendall Seiler

Mentor: Dawn De Vries

The purpose of this study is to examine the benefits and outcomes of nature-based interventions for children who have experienced trauma through domestic violence. This research will explore implications of therapeutic

recreation programming for this population, specifically focusing on the improvements of emotional regulation.

KIRKHOF CENTER 2201

Digital Blackface and AAVE Appropriation Online

Presenter: Sarah McLellan

Mentor: Rachel Anderson

Following the “American tradition” of blackfaced minstrel acts, digital blackface has recently been addressed in discussions surrounding representation online. Preliminary research suggests that persons who do not speak African American Vernacular English (AAVE) use the language online in order to appear cooler, more well-rounded, and even more sympathetic to underrepresented groups. However, the use of AAVE by these speakers is often linguistically deviant from the rules that AAVE follows and is often used as a punchline. By examining previous research conducted on topics ranging from the history of blackface, “digitalk,” and white fragility, it is empirically suggested that the use of AAVE by those who do not fluently speak the language is a morphed method of blackface. In this presentation, the social settings that allow this action to occur will be examined, as well as the societal implications and consequences of this linguistic act.

KIRKHOF CENTER 2259

Guns and Growth: How Wars of Independence Impact Economic Growth

Presenter: Rachel Kalusniak

Mentor: Thomas Walker

While wars threaten the stability of new states, the same wars may also have a significant positive effect on states’ economic growth. I analyze the role wars of independence have in the economic growth of states formed after the Second World War. My argument examines Charles Tilly’s 1985 aphorism “war makes states,” where Tilly contends threats force leaders to ensure their survival by creating government institutions and granting rights to their citizens. I also consider the claims of Sorenson (2002), stating that the post-war international order assures state boundaries, so wars no longer force states to create strong institutions to survive. Using data from the Correlates of War Project, I employ a large-n regression to predict real gross domestic product (GDP) per capita growth for more than 100 newly-independent states. My research tests the hypothesis that wars of independence play a significant role in raising the living standards of newly-independent states.

KIRKHOF CENTER 2266

Censorship in Film and Video

Presenter: Jackson Boomershine

Mentor: Kim Roberts

Censorship. As long as humans have had the means to spread information, there have always been those who would attempt to suppress or alter it. Films have been at the center of the censorship controversy since its inception. This presentation will not refer to merely the bleeping out of curse words, or blurring sexual images, but will examine censorship’s more damaging effects. Censorship in the film industry takes the form of banning television shows or movies, and not allowing certain ideas or perceptions to be expressed to the public. Although censorship is carried out in various countries to differing degrees, this talk will concentrate on censorship in the U.S. This presentation will focus on how film is an artistic expression, and that censorship ultimately harms our culture and society as a whole.

KIRKHOF CENTER 2270

Buying Friends?

Presenter: Henry Wraight

Mentor: John Constantelos

This paper analyzes whether or not US foreign aid shapes foreign public opinion of the United States. In other words, can the US “buy” friends? This study covers 37 states that received varying levels of US aid during the Trump administration, ranging from no aid to high amounts of aid. Other variables such as United States military involvement by country and democratization indexes will be taken into account. I find that while there is a relationship between aid and US popularity, other factors are more statistically significant.

Beginning at 12:30 PM

KIRKHOF CENTER 1142

Children with Trauma and Attachment

Presenters: Holly Douglas, Hannah Gawthorp, Marissa Khalifa

Mentor: Dawn De Vries

The purpose of this study is to demonstrate the positive outcomes of therapeutic recreation interpersonal skills interventions for children diagnosed with Post Traumatic Stress Disorder (PTSD) and Reactive Attachment Disorder (RAD). The positive outcomes of interpersonal skills interventions will be presented through the assessment of attachment of child to caregiver or guardian and therapeutic recreation related assessments. Included will be team building exercises and various activities to increase coping skills and positive adult-child interaction through therapeutic recreation programming and interventions. The definition of trauma and trauma related disorders will be explained as well as attachment and coping skills.

KIRKHOF CENTER 2201

Number of Prime Labelings of Friendship Graphs

Presenters: Nicholas Layman, Payton Miloser, Austin Roberts

Mentors: Feryal Alayont, Lauren Keough

A graph is a collection of vertices and edges connecting those vertices. Two vertices connected by an edge are called neighbors. A friendship graph is a graph where every pair of vertices shares exactly one common neighbor and all pairs of neighbors are connected to a central vertex. A graph of n vertices is said to admit a prime labeling if we can label its vertices with the first n natural numbers so that any two vertices that are neighbors have relatively prime labels. We will discuss prime labelings of friendship graphs building off of the friendship theorem initially proven by Paul Erdős, Alfréd Rényi, and Vera Sós in 1966. We explore what patterns may exist in the number of prime labelings of friendship graphs of a given size.

KIRKHOF CENTER 2259

The Alleged “Unimportance” of Art in American Public Schools

Presenter: Kirie Quackenbush

Mentor: Kim Roberts

According to findings reported in 2012 in the article *The Good and Bad News About Art Education in US Schools*,

“fewer elementary schools are offering visual arts, dance, and drama classes than during a decade ago. Overall, nearly 4 million elementary school students do not get any visual arts instruction at school whatsoever. This presentation will examine the important fact that, without art in K-12 schools, we would not have creative human expression relevant to things that we need and use everyday, such as furniture, architecture, landscaping, or a myriad of other daily experiences that make us human. By continuing the growing economic movement to remove art from core education in our schools, we are at risk of creating a society and workforce of clones that follow the same mindset fostered from a STEM-focused curriculum. The dwindling value of art as self-expression and creativity is an issue to be resolved immediately.

KIRKHOF CENTER 2266

The Toppling of Apartheid

Presenter: Courtney Hartline

Mentor: Thomas Walker

Academics have long overemphasized the economic impact of U.S. sanctions in curbing South Africa's abusive system of apartheid in the 1980s. I contend that the fall of the Soviet bloc, the removal of South African rosters from international sports leagues, and the symbolic power of U.S. imposed sanctions contributed more heavily to apartheid's undoing than the economic impact of sanctions collectively. I will construct this argument through coupling a variety of sociological works discussing the determinants of governmental legitimacy with articles arguing that sanctions impose both emotional and societal effects in addition to economic consequences. Finally, I will address how the ANC channeled “the people's power” to topple the apartheid regime following the introduction of punitive sanctions in South Africa. Through taking these steps, I will demonstrate that the key to apartheid's end lies in the symbolic nature of numerous events—not in the economic impact of sanctioning alone.

KIRKHOF CENTER 2270

Colonialism in Film

Presenter: Alexander Walters

Mentor: Kim Roberts

This presentation will explore the history of colonialism and its relationship with narrative cinema. Storytelling tropes such as the “white savior” will be examined using examples such as *Avatar*, *The Last Samurai*, and *Dances with Wolves*. It will then dig deeper into colonialist influences on modern day cinema and examine the progress made in venturing away from these tropes such as in the films *Black Panther* and *Get Out*.

Beginning at 1:00 PM

KIRKHOF CENTER 1104

An Analysis of Wilderness Trail Densities within Grizzly Bear Habitats

Presenter: Jessica Hauch

Mentor: Griff Griffin

Grizzly bears (*Ursus arctos horribilis*) are wilderness-dependent and can be affected by human interactions. Research has shown that human interactions have many effects on grizzly bears and their habitat, such as reducing the number of cubs, limiting access to food and water, and displacement. The purpose of this analysis is to compare which wilderness areas have better suitability for grizzly bears based on trail densities. Spatial Forest Service data

and ArcGIS were used to map and analyze trail densities within wilderness areas. The study areas are in alpine ecosystems of Montana, Wyoming and Idaho wildernesses where grizzly bear populations are currently distributed. My hypothesis is that smaller wildernesses will have lower trail densities, resulting in less human disturbances to grizzly bears and their habitats. Management in high trail density areas should focus on informing visitors of bear safety tactics.

KIRKHOF CENTER 1142

Refugee Community Integration and Therapeutic Recreation

Presenter: Kailee Moran

Mentor: Dawn De Vries

Discussion of the unique needs of Refugee Women in America based on their experiences in their country of origin and current host country. Self-efficacy has been shown to be a significant predictor of mental health status, a mediating factor in stress, has been shown to increase ability to communicate their needs, and contributes to Refugee Women's overall independence. Certified Therapeutic Recreation Specialists have the qualifications to provide specialized programming such as Assertiveness Training to address these needs in a holistic manner. The attainment of Recreation Therapy goals assists Refugee Women in their resettlement and acclimation into a new culture such as job attainment and money management in addition to other areas of development.

KIRKHOF CENTER 2201

The Social Relevance of Documentaries

Presenter: Kaylie Gallaher

Mentor: Kim Roberts

Documentaries are increasingly important in our divided society- especially when meticulously studied and created by those dedicated to the objective truth, rather than pushing a tainted agenda by altering footage or intentionally using other tactics in order to be misleading. I will explore the vastly underrated category of documentary films that have the ability to connect to audiences on a deep, personal level. As the old adage goes, "truth is stranger than fiction"- and the truth deserves to be told. I will argue that an honest, raw, eye-opening documentary is more satisfying to view than fictional films, and that meaningful societal change is made possible when an audience is profoundly inspired. Documentaries that feature actual people in relatable situations can help others who may need a voice while also creating a community of differences to find common ground. I will examine various influential documentaries of different genres and their overall impact on society.

KIRKHOF CENTER 2259

Access to Care

Presenter: Hailey Jones

Mentor: Leslie Muller

Millions of Americans gained health insurance after the Affordable Care Act (ACA) was implemented. The ACA goal was to provide universal healthcare through subsidies, mandates, expansion of Medicaid and the marketplaces starting in 2014. We will be examining access to care for people between 138% - 400% Federal Poverty Line (FPL) who qualify for subsidies and excluding those under the Medicaid expansion. With data from the National Health Interview Survey (NHIS) we are able to examine access to care before and after the ACA was enacted using pooled OLS models to examine the data in regard to changes pre-ACA and post-ACA. This article

will also look at factors that lead to access to care, and potential reasons why access to care can be an issue.

KIRKHOF CENTER 2266

National Student Advertising Competition (NSAC) Team

Presenters: Miranda Crews, Bailee Gunderson, Wesley Morgan, Zachary Noonan, Alexander Warner

Mentor: Robin Spring

One of the most iconic foods in the United States, the hot dog, is going through a perception problem. While the food is a crucial part of many American lives, some feel that the image of the hot dog is struggling. Among those who are concerned is the world's largest hot dog chain. Wienerschnitzel has asked the 150+ National Student Advertising Competition (NSAC) teams to help elevate the image of the hot dog. The NSAC is the premier college advertising competition and the GVSU team has been working for the past 7 months to develop an advertising campaign for Wienerschnitzel.

KIRKHOF CENTER 2270

The Special Effect of Nostalgia

Presenter: Andrew Moss

Mentor: Kim Roberts

With the recent release of *Ready Player One* (Line & Spielberg, 2018), nostalgic 80's kids can now relive fights between The Iron Giant and Gundam action figures on the big screen. *Ready Player One* is a prime example of the increase of remakes, reboots, sequels, and adaptations that have taken over movie theaters and have caused concern of Hollywood's tactics of using the human emotion "nostalgia" to promote the popularity of a movie franchise. Owen Evans (2017) clarifies that these types of films are 60% of what is being produced in Hollywood for the mass audiences today and any change in popularity could drastically change the way Hollywood makes movies. "Challenging films have been repackaged in less demanding ways to reach popular audiences and thereby mask the dearth of quality in mainstream cinema" (Evans, 2017, p. 181). The recent boom of nostalgic extensions could save itself from burning out in the next few decades to possibly thriving throughout the next century.

Beginning at 1:30 PM

KIRKHOF CENTER 1104

Light Spectrum Effects on Growth Characteristics of Lettuce in Seedling to Plug Stages

Presenter: Jessie Carle

Mentor: Griff Griffin

Lettuce farmers, whether they grow indoors or in greenhouses, grow their lettuce with specific characteristics in mind. Different LED light spectrums can trigger different characteristics to be shown in the lettuce's growth. This research is to determine the lettuce characteristics, in the seedling to plug stages, that are brought out by three different light spectrum recipes: balanced, seedling, and vegetative. The observation of leaf pigmentation and the measurements of root length, root weight, vegetation length, vegetation weight, total length, and total weight are collected at weeks two, three, and four of growth. It is hypothesized that the balanced lamp, will have small compact plants with large roots and rich red pigmentation due to the blue LEDs. The seedling lamp will have an even root/vegetation ratio due to its three red to one blue LED ratio. The vegetative lamp will have large vegetation on top compared to its root growth and to the other lamps due to the far-red LEDs.

KIRKHOF CENTER 1142

Adventure Therapy with Native American Adolescents who have PTSD

Presenters: Sarah Bergler, Emily Harrison, Taylor Yau

Mentor: Dawn De Vries

The purpose of this study is to demonstrate the benefits that Adventure Therapy can have on Native American adolescents who have symptoms of PTSD. Adverse childhood experiences, specifically physical, emotional and sexual abuse, associate deeply with numerous risk factors and mental health outcomes among adolescents. By participating in various types of adventure therapy, individuals gain a sense of self-control while being in a relatively uncontrolled environment. In doing so, participants experience a new form of trust (for others and themselves) that they potentially lost through past traumatic experience. The effectiveness of Adventure Therapy Interventions will reveal the most successful practices to implement for Native Americans with PTSD.

KIRKHOF CENTER 2201

Hysterical, Dramatic, Difficult: Women's Experiences of Gender Pain Bias in America

Presenter: Gabrielle Lewis

Mentor: Karen Zivi

In contemporary medicine, women's pain is often met with disbelief from doctors, and women must work to have their pain accepted and treated. Using an intersectional analysis, I will research the origins of this gendered pain bias and demonstrate how the current medical structure is based on a white male body and how this negatively impacts women. Paying particular attention to histories of hysteria and medical education, as well as contemporary women's experiences in doctors offices, I will demonstrate why this pain bias continues to thrive in the current male modeled, evidence based medical system. Throughout my research, an intersectional lens will be used to understand how different identities further complicate the issue. While the fact of gender pain bias is present in media and academia, I hope to provide a deeper analysis of why this bias occurs and potentially offer solutions on how to address the problem in the future.

KIRKHOF CENTER 2259

Food Security Among College Students

Presenters: Jane Kuipers, Joseph Lesniak

Mentor: John Gabrosek

We will be discussing the occurrences of food security/insecurity among college students in the Grand Rapids area. A client presented us with a survey she gave college students that included questions related to their workload and questions that determine if they were food secure. The data from the surveys collected was used to determine if variables such as GPA and credit hours impact food security and vice versa. We will also be discussing what we have learned this semester through the statistical consulting process. This includes working with real data, working alongside other consultants and meeting a client's needs.

KIRKHOF CENTER 2266

Statistical Analysis of Phone Records for Law Enforcement

Presenters: Jenna Gibbons, Jessica Herold, Taylor Kooy, Michael Stawinski

Mentor: John Gabrosek

This project focused on analyzing cell phone records (for one individual, both receiving and outgoing) from the Office of the Attorney General. The data set provided contained over 70,000 records with 8 variables. The cell phone records were analyzed in order to determine discernible patterns in time, duration, location and phone number. The primary goal of this research was to identify relevant data pertaining to the subject of investigations, particularly call history related to the illegal activity under investigation. One of the essential objectives was to quantify these patterns in a meaningful way. This analysis could help to provide insight into the potential for a specific individual to be involved in the criminal activity under investigation. The synthesis of this research will be used in the law enforcement community in order to help aid official criminal investigations. We will conclude with an overview about our experiences as statistical consultants.

KIRKHOF CENTER 2270

Supporting Trauma Informed Schools

Presenters: Arielle Roberson, Courtney Sandborn

Mentor: John Gabrosek

Mental health is continuing to become a larger part of the global conversation regarding one's overall health. We are analyzing survey information from a sample of 13 respondents originating from Pädagogische Hochschule Schwäbisch Gmünd, Germany; Grand Valley State University College of Education; and Lucknow, India to investigate how mental health affects educators around the world. Our interest is also in determining whether the stigma surrounding mental health hinders the active discussion of this issue. This project serves as a pilot study to determine if further research on the population of international educators is justified to better understand mental health and well-being.

Beginning at 2:00 PM

KIRKHOF CENTER 1104

Effectiveness of Restoring an Arid Ecosystem after a Wildfire Disturbance

Presenter: Caitlin Marek

Mentor: Griff Griffin

The purpose of this research is to determine the effectiveness of restoring arid ecosystems after a wildfire disturbance. Managers need to know what vegetation was present before a wildfire to be most successful in their restoration efforts. Restoration of arid ecosystems is difficult because the natural plant recruitment in arid systems are spatially and temporally irregular. Factors that affect the restoration are the severity of the fire, plant phenology, and site conditions including moisture, nutrients, light, and disturbance history. Invasive species also pose a threat to restoring arid ecosystems because many invasive plants thrive after areas have been disturbed by fire.

KIRKHOF CENTER 1142

Therapeutic Use of Virtual Reality for Veterans with PTSD

Presenters: Angela Ciotti, Michael Debruine, Jessica Eisen, Zachary Elders

Mentor: Dawn De Vries

In a world that is continually advancing through technology, technological uses can be adapted into a variety of fields. With this in mind, it is crucial to investigate how this modernized technology can be implemented into healthcare practices. This presentation and literature review will examine virtual reality as a therapeutic recreation

treatment modality for military personnel diagnosed with Post-Traumatic Stress Disorder.

KIRKHOF CENTER 2259

The Marshall Plan's Economic Success

Presenter: Eric Gable

Mentor: Thomas Walker

In the wake of World War Two, the United States seized the opportunity to rebuild war-torn European states and promote free trade between stable democracies. This Kantian peace through trade is the most noted justification for the United States' Marshall Plan in 1948. Some argue that the effectiveness of the Marshall Plan lies within the underlying realist geopolitical strategy. Scholars such as Hans Morgenthau attribute the Marshall Plan's success to the political strategy of foreign aid. In this analysis, I argue the Marshall Plan's effectiveness was due to economic integration and private investment. The exponential return on investment and the ability to create new markets for American private investment contributed to the United States' economic advantage over the Soviet Union. The Marshall Plan's economic impact on Europe and the United States makes it a case study in effective foreign aid policy.

KIRKHOF CENTER 2266

The Impact of Income Inequality on Populism

Presenter: Austin Wright

Mentor: Thomas Walker

There has been a significant increase in income inequality within several states since the 1980s. Beginning in the same decade, there has also been a significant surge in the success of populists within several states. This phenomenon is exclusive to neither the developed nor the developing world. This is a dangerous trend because populists tend to be authoritarian in nature and threaten to break down democratic institutions within states and in the world. By using process tracing in three cases – Hungary, India, and Brazil – I argue that although income inequality provides fertile grounds for resentment of the elite in a state, it does not significantly and effectively lead to increased support for populist candidates and parties without an accompanying crisis or other underlying factors.

KIRKHOF CENTER 2270

The Treatment of Acute Stress Disorder and Other Mental Disorders Post-Myocardial Infarction

Presenter: Elizabeth Lozon

Mentor: Matthew Feeback

Purpose: Analyze and identify the connection between post-myocardial infarction (MI) patients and associated mental health disorders such as acute stress disorder (ASD) through related literature. Methods: Research concerning the mechanisms of MI and ASD were considered as well as research that detailed long term health outcomes for this specific population. Research pertaining to the treatment of ASD in concert with cardiac rehab were examined as well. Expectations: To further understand the relationship between post-MI patients' physical treatment in conjunction with ASD while in cardiac rehab. Furthermore this project aims to provide further discussion on how to ensure that the entire patient is being treated, not just the physical being. Conclusion: Current research suggests a connection between ASD post-MI. Further study is needed to identify a universal approach when diagnosing these disorders.

Beginning at 2:30 PM

KIRKHOF CENTER 1104

Implications of the Grand River Restoration Project on Habitat for Large Fish

Presenter: Nicholas Proefke

Mentor: Griff Griffin

Conditions in the Grand River of Grand Rapids, Michigan, will be returned to their natural state through a restoration project. This includes removal of five dams and addition of larger substrate. The purpose of this study is to investigate how the altered river conditions will affect the habitat for *Oncorhynchus tshawytscha*, *Oncorhynchus mykiss*, *Oncorhynchus kisutch*, *Acipenser fulvescens*, and *Sander vitreus*. These species prefer certain specifications for their ideal habitat. Some habitat factors include home range, foraging, and spawning grounds. Characteristics range from biological, chemical, and physical. Conditions that will be analyzed include velocity, dissolved oxygen levels, and substrate. For example, salmonids require large home ranges for spawning and smaller substrate, while sturgeon prefer larger rock substrate. Monitoring can help determine the implications the Grand River Restoration project may have on the targeted fish species in the Grand River.

KIRKHOF CENTER 1142

Therapeutic Recreation Interventions for Reducing Recidivism

Presenters: Nikki Marie Alcini, Cecilia Biolchini, Audrie Haller, Samantha Wirt

Mentor: Dawn De Vries

We live in a world where less than 15 percent of the prison population is exposed to treatment services while incarcerated. Due to this lack of transitional and supportive programming offered to past and current offenders, Therapeutic Recreation interventions can be implemented to reduce recidivism rates and benefit society all together. Recidivism is the tendency for a convicted criminal to reoffend. In the United States, five out of six state prisoners were arrested at least once during the nine years after their release. We must evaluate the effectiveness of current resources available to prisoners and push for a change to implement Therapeutic Recreation modalities and interventions into their treatment.

KIRKHOF CENTER 2201

Ethnographic Analysis of Raleigh Finkelstein Hall

Presenter: Alexander Miller

Mentor: Tara Hefferan

The Faculty Facilities Planning Advisory Committee (FFPAC) has enlisted the help of an anthropology intern to complete ethnographic research in Rayleigh Finkelstein Hall (RFH) to assess the space of the building and how it is being used by faculty and staff. Through interviews, focus groups, surveys, and participant observation, the intern found that the current space in Finkelstein Hall is functional, but can be improved upon. Participants expressed concerns towards parking and safety, lack of study spaces, and the under-utilization of laboratory equipment. Students and faculty in Finkelstein Hall have worked to circumvent these issues, but would greatly benefit from evaluation and restructuring of space inside the building and out.

KIRKHOF CENTER 2259

Sheltering Students

Presenter: Jennifer Martinez

Mentor: Denise Goerisch

A growing issue across US universities is student homelessness and housing insecurity. In the fall semester I conducted a survey to find more about housing and housing insecurity at Grand Valley. The first significant finding is that housing is not affordable to many students. Also, a significant number of students are accessing emergency means of housing. Perhaps the most significant finding is that most students believe that housing insecurity is an issue at GVSU. I intend to create recommendations based upon these findings.

KIRKHOF CENTER 2266

Language Attitudes of Writing Center Consultants

Presenter: Benjamin Sparks

Mentor: Colleen Brice

This presentation explores the results of research into the language attitudes of peer consultants at the GVSU writing center. A survey was administered to writing center staff in which they were asked to evaluate the sociopolitical relationship between standard and nonstandard English dialects, the perceived relative grammaticality of these dialects, and the traditional concept of appropriateness in academic writing. Also included were questions pertaining to how consultants manage the practical responsibilities of their positions and the expectations of students and professors with the writing center's stated policy of linguistic inclusivity. Preliminary analysis of collected data suggests that consultants are aware of dialect variation and understand the principle that all dialects are equally valid and rule-governed but feel frustrated when trying to promote linguistic diversity as standard English largely remains the only accepted dialect in academic and professional writing.

KIRKHOF CENTER 2270

Is Industrial Chemistry Sustainable?

Presenter: Jeffrey Gwasdacus

Mentor: Dalila Kovacs

Green chemistry is the ideal standard for safety and environmental conservation. Utilizing the idea of a circular economy, industrial chemists have developed ways to balance green chemistry' principles with applications of sustainable chemistry at industrial scale. This presentation will explain what green chemistry is, how it differs from sustainable chemistry, the shortcomings of current measuring methods for the green-ness of a chemical process, and a few examples of the circular economy in action.

Beginning at 3:00 PM

KIRKHOF CENTER 1104

The Similarity of Camping Rules in Adjacent Wildernesses

Presenter: Lucas Wrona

Mentor: Griff Griffin

The purpose of this research is to determine the similarity of adjacent wildernesses for camping and fire rules. These adjacent areas should be managed similarly because these areas share similar factors that a manager looks for when they decide to make a rule. To study this, I looked at current documents and records that are put out

by the appropriate wilderness managers. Of the sixteen wildernesses that I studied for nine rules, I found that they are managed in a similar manner. Fire rules include them being set back from water, setback from trail, must use fire ring, use fire blanket or grate, and fire prohibited above an elevation. Camping rules are setback from water, setback from trails, setback from other camps, and camps prohibited in some areas. Half of the areas are managed by the Forest Service and the other half is split up between the Bureau of Land Management and the National Park Service.

KIRKHOF CENTER 1142

Animal Assisted Interventions for Mental Well-Being of College Students

Presenters: Madison Berridge, Sophia Houtman, Nicole Lauretti

Mentor: Dawn De Vries

College students are at high risk for mental illness due to their exposure to stress and life changes. Due to this stress, anxiety and depressive disorders have an increased likelihood of occurring. The rise in mental illness can ultimately interfere with the young adults' ability to focus on their schooling. Animals have become increasingly recognized for their therapeutic benefits, such as reduction in stress, reduction in anxiety, and an increased mood. While there are a variety of populations that can benefit from this intervention, college students may benefit greatly due to the amount of stress they are put under during their schooling.

KIRKHOF CENTER 2201

Comprehensive Measures of Mobility in Urban Research

Presenters: Carly Aller, Trang Nguyen

Mentor: John Gabrosek

Explanatory variables such as population density are the industry standards in predicting the ease of mobility of a city environment. Often, urban research professionals focus solely on the correlation between density and multimodality. A comprehensive explanatory variable that would be a more accurate representation of the mobility of mid-sized cities across the U.S. is Commute Mode Diversity (CMD). This is a measure that accounts for modes of transportation other than a single-occupied automobile. It captures residents who choose to walk, bike, or use public transit in a way that other measures do not. Using multivariate analysis of variance and regression beta coefficients, we will be analyzing the importance CMD has on predicting the mobility of a city and comparing this with the importance density and other explanatory variables have. In future analysis of multimodality, a combination of CMD and other existing variables could lead to a more comprehensive picture.

KIRKHOF CENTER 2259

Parenting and Financial Outcomes: Findings From Emerging Adults Attending College

Presenter: Kegan Olsen

Mentor: Mihaela Friedlmeier

Various studies have shown that parents play a critical role in shaping their children's financial skills and attitudes. However, very few studies have investigated how family processes, such as parenting style, affect the degree of influence parents have upon their children's financial expectations and behaviors. For the current study, we used 366 college students ($M_{age} = 19.37$ years, $SD = 1.83$ years; 71.0% females, 86.0% Caucasian) to investigate the predictive and moderating influences of parental behaviors on children's financial outcomes. Our findings indicated that high levels of behavioral control in parents were positively related to children's healthy financial behaviors

and financial satisfaction. Additionally, parental responsiveness moderates the transmission of healthy financial behaviors from parents to children. Knowing relevant socialization factors that lead to healthy financial outcomes helps to enhance young people's financial and overall well-being.

KIRKHOF CENTER 2266

Unravelling Anesthetics – Elucidation of Chloroform's Inhibitory Mechanisms on *Characean* Internodal Cells

Presenter: Stefanos Apostle

Mentor: Mark Staves

Anesthetics have long been used to enable advanced medical operations and improve patient wellbeing. However, in spite of the importance of anesthesia, we have no good understanding of its mechanism. This presentation aims to lend insight into the mechanisms governing anesthesia. My research has been conducted using chloroform as a model anesthetic on large *Characean* internodal cells. Due to their simple structure and giant size, we can study anesthesia at the single-cell level. We have developed reproducible techniques, characterized threshold concentrations for anesthesia, and began to understand the means by which chloroform anesthetizes *Chara* cells. We have shown that chloroform: 1) has a long-lasting effect post-recovery, increasing with additional treatments; 2) increases cell sensitivity to external calcium post-recovery; and 3) increases the efficacy of an external calcium channel blocker post-recovery, demonstrating potential interactions between ion channels and chloroform.

KIRKHOF CENTER 2270

Where are the Women in Competitive Magic the Gathering (MTG)?

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 recently initiated 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 test these explanations, present our results, and discuss their potential implications for understanding women's underrepresentation in other achievement areas.

Beginning at 3:30 PM

KIRKHOF CENTER 2201

Memento Mori: A Cross Cultural Analysis and Critique of the Western Death Industry

Presenter: Keyley Kelly

Mentor: Gwyn Madden

The western death industry is problematic. Funeral costs are too high, there are many recent cases of corruption, and there are multiple environmental concerns with the methods used by the industry. This presentation seeks to critique all of the problems within the death industry, attempts to provide solutions to a few of those problems, and provide a cross-cultural analysis to show that our practices aren't the only way we can mourn our loved ones. This

data was obtained from scholarly articles surrounding death practices around the world, the effect of neoliberalism on the death industry, and occupational and environmental hazards caused by the industry.

KIRKHOF CENTER 2259

A Black Feminist Content Analysis of Gender and Sexuality in *Living Single*

Presenter: Amarri Smallwood

Mentor: Ayana Weekley

Between the 1980's and 1990's there were many female-centered sitcom television shows like *The Golden Girls*, *Designing Women*, and *Sex in the City* that explored women's sexuality from an autonomous perspective. However, Black women's sexuality in sitcoms has yet to be examined as both oppositional and equally significant. This research focuses on the importance of resistant sexual representations in the 1990's sitcom *Living Single*. This content analysis is drawn from eight episodes spanning season's one through four. The study uses a Black Feminist theoretical framework to analyze how *Living Single* countered stereotypes of Black women's sexuality. Additionally, this project examines how *Living Single* challenged gender norms for Black women. The questions that will be explored are: How did *Living Single* provide alternative representations for Black women's gender and sexuality? In addition to, why is Black women's sexual freedom an important representation for television?

KIRKHOF CENTER 2266

Developing a Transcartohistoriography

Presenter: Alexis Hansen

Mentor: Lawrence Burns

Transgender issues have come to the forefront of mainstream LGBTQ dialogues, but a critical theoretical lens is often lacking from such narratives. Our study elucidates a more nuanced story by mapping the past, present, and future scholarly topography of transgender studies in order to uncover a roadmap of where the trans perspective is centered, what dialogues appear in the field, and where this area of study is going. Metadata from abstracts and article titles of three literature databases was organized into bibliometric networks that map key topics and shifts in terminology over time. These maps suggest an increase in disciplinary divisions over time but less pathologized conversation. As a pilot study, our research also showcases the value of transgender theoretical framework as a catalyst for major social change and effective political praxis, evidenced by correlations between activism and semantic shifts.

KIRKHOF CENTER 2270

The Effect of Climate Change on Wildfires

Presenter: Jacob Ward

Mentor: Griff Griffin

Climate change has been putting pressure upon the biosphere. One of the pressures being leveled onto many ecosystems is the change of fire regimes. By using weather and fire models, many experts have been able to model and give estimations on how the fire regime will change. With increasing temperatures, there is predicted to be changes in frequency, intensity, season, and severity. All of the changes in fire behavior poses a threat to those living within fire dependent and altered ecosystems.

Beginning at 4:00 PM

KIRKHOF CENTER 2259

Prime Labelings of Caterpillar Graphs

Presenters: Hunter Binkley, Jennifer Hoxie, Aryn Van Laanen

Mentors: Feryal Alayont, Lauren Keough

A graph is a set of vertices represented by points and a set of edges which connect pairs of vertices and are represented by line segments between the points. If a vertex is directly connected to another vertex by an edge then those two vertices are adjacent. A prime labeled graph means that every vertex is labeled using labels up to n , where n is the number of vertices, so that adjacent vertices have labels that do not share a common factor greater than one. In other words, each vertex label is relatively prime to each adjacent vertex label. A caterpillar graph is constructed with a body made of a path of vertices and edges. It then has legs, which are edges, that extend from the vertices of the body to a pendant vertex. We explore prime labeling and variations of prime labelings of caterpillars and other related graphs.

KIRKHOF CENTER 2270

The Lesbian Avengers and Media Framing

Presenter: Elizabeth Moose

Mentor: Jae Basiliere

The Lesbian Avengers are an activist group that describes themselves as a group totally focused on high-impact street activism, not on talking. The group originated in New York City in 1992 out of frustration with activist rhetoric that did not focus on lesbian issues. Among the many great tactics the Avengers used, media manipulation for the benefit of the group is one that stands out for its impact on the tools used by activist, today. This paper will compare media framings from before, during, and after the Lesbian Avengers peak (1992-1995) in order to identify the transitional moment media perceptions began to influence activism.

Beginning at 4:30 PM

KIRKHOF CENTER 2266

How Modern Marketing Strategies Affect the Financial Success of a Film

Presenter: Sam Hendricks

Mentor: Kim Roberts

The film industry is an environment of ambiguity in the sense that filmmakers spend exorbitant amounts of money without any real way of knowing how financially successful their film(s) will be. In most cases, the classical marketing strategy for promoting films has been building awareness through print and broadcast platforms in hopes of attracting a wide array of paying customers. But, this traditional method has little focus for targeting those types of audiences. The hypothesis for this presentation is that through extensive demographic research incorporated with innovative marketing engagements, a film's income should exceed its costs. Peer-reviewed sources provided results in support of the hypothesis, that a higher revenue stream comes with proper demographic research paired with creative promotional interactions. This implies that modern marketing is highly effective in its contribution to the financial well-being of a film.

KIRKHOF CENTER 2270

Effects of Hurricane Maria on an Epiphytic Community in El Yunque National Forest, Puerto Rico

Presenter: Brendan Kosnik

Mentor: Gary Greer

Global climate change has increased the frequency of severe weather phenomena, such as Hurricane Maria, which devastated Puerto Rico's forests in September 2017. We investigated Maria's effects on lower-trunk epiphytes (i.e., plants growing on the first 3 m of trees) at mid-elevation in El Yunque National Forest during a field survey in May-June 2018. In fifteen circular plots across a 1500m transect, we measured: (1) size of standing and fallen trees, (2) canopy cover, (3) epiphyte species presence, and (4) epiphyte leaf size, tearing (from wind), and discoloration (from exposure) for dominant fern and bromeliad species (determined from a 2012 community survey). We did not find larger trees to be significantly more vulnerable to falling, but we did observe a ~15% decrease in the total number of epiphyte species. Some groups (e.g., vines) thrived in the new environment. Median damage level differed among focal species, but damage did not correlate with leaf or plant size.

Panel Presentations Abstracts & Schedule

Beginning at 9:00 AM

KIRKHOF CENTER 2215/2216

Inventing Lives

Presenters: Abigail Boersma, Melissa Dean, Diana Duarte-Menendez

Mentor: Zulema Moret

Abigail Boersma

“Para los perdidos”

This piece focuses on a character inserted in the universe created by Mario Bellatin in his novel, *Salón de belleza*. This novel explores how people react to others, especially the infected and sick, when a seemingly incurable and deadly sickness creates an epidemic across the lives of many. Based off of the style and themes in this novel, this text highlights how death and sickness does not discriminate against any age and any social and personal condition. This is Javier's short bio.

Melissa Dean

“La esperanza: como espíritu que se va...”

This piece focuses on a character inserted in the universe created by Mario Bellatin in his novel, *Salón de belleza*. This novel explores how people react to others, especially the infected and sick, when a seemingly incurable and deadly sickness creates an epidemic across the lives of many. Based off of the style and themes in this novel, it tells the story of a man who also finds taking shelter at the beauty salon after being rejected by society from developing the sickness. Themes discussing marginalization of peoples, religion, hope, and nihilism are highlighted in this piece as it is in the original novel. Although many may stay optimistic during outbreaks and epidemics, this work aims to illustrate the (possibly justifiable) harsh attitude of the owner of the beauty salon- that in these times, optimism is the deadliest, and cruelest, epidemic of all

Diana Duarte-Menendez

“El abrir y cerrar de mi vida”

This piece focuses on a character inserted in the universe created by Mario Bellatin in his novel, *Salón de belleza*. This novel explores how people react to others, especially the infected and sick, when a seemingly incurable and deadly sickness creates an epidemic across the lives of many. Based off of the style and themes in this novel, this text highlights how death and sickness does not discriminate against any age and any social and personal condition. This is the story of a character who has lived a secret double life before arriving to die at the “Moridero”. This monologue discusses how he couldn't reconcile his two lives in a traditional society.

KIRKHOF CENTER 2263

Feminist Analysis of Culture Formation

Presenters: Lauren Bedford, Abigail Coberly, Christianna Dixon

Mentors: Julia Mason, Leifa Mayers

Lauren Bedford

Masculinity performed specifically by traditionally-aged fraternity men is a brand of masculinity that has not been

closely examined in an academic context. This research includes a survey of 18-25 year old, fraternity men at Grand Valley to analyze how they feel fraternity culture and life has shaped them as a person. This research uses a narrative, qualitative approach to focus on the overall story told by the data that I receive from my survey participants. It is worth being looked at due to the fact that 18-24 year old college students joining fraternities is a common occurrence, and asking how that particular performance of masculinity shapes them from the barely-legal boys who just graduated high school into the men they are when they graduate. Knowing how it affected those who participate in fraternity culture allows us to view the sort of benefits or detriments that fraternities can have on its members.

Abigail Coberly

Gender stereotypes have been institutionalized in college athletics through media portrayals and reinforcement of behavioral expectations, which restrict the ways student athletes are permitted to perform gender within and outside of their sports. These beliefs influence athletes' experiences and perceptions of gender as a construct, and their conceptions of their own gender identities. Using narrative analysis, this study seeks to understand the ways athletes are impacted by gender stereotypes according to their personal experiences and positionality in college athletics. Qualitative data obtained through an online survey describe how athletes are impacted by gender stereotypes and participation in sports, which are coded and interpreted using an intersectional lens. The goal of this study is to interrogate the ways stereotypes are applied to and affect athletes according to athletes themselves, which will aid in finding ways to disentangle gender stereotypes from sports culture.

Christianna Dixon

How information about sexual health is presented is imperative in understanding women's sexual autonomy, anatomy, and socio/cultural ideas around women's sexuality and sexual health. Information about sexual health, particularly women's sexual health and sexual functioning, shapes our understanding of sexuality itself. I will examine how women's sexual health information is presented on the Center for Disease Control and Prevention's website under the Sexual Health tab. Using Discourse Analysis, I will examine various kinds of information that the CDC presents around women's sexual health and sexual functioning. I will gather my data by searching for emerging themes within the texts and online images that the CDC produces regarding sexual health and sexuality. Because all women and men have sexual anatomy and a type of sexuality that they express, the information that they use to learn about their bodies can have a direct impact on how they feel about their bodies.

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Reconciling the Past with the Present in Latin America

Presenters: Kendra Garcia, Shelby Godlewski, Taylor Slais

Mentor: David Stark

Kendra Garcia

The research examines the field of Afro-Mexican history, in particular how the field has evolved, how Afro-Mexicans have been marginalized and reclaimed their place within the nation. Three questions guide my analysis: one, how and why were Afro-Mexicans rendered invisible in the historiography; two, what prompted renewed interest in Afro-Mexicans and three, what have they done to raise awareness or fight for inclusion? My central argument is around how the concept of *mestizaje* was used to marginalize Afro-Mexicans. As such, the gap in the research is due to the erasure of Afro-Mexicans from national identity, and general emphasis on *mestizaje* in the period after the Revolution. A resurgence in the field began as a result of a growing interest in comparative history, the era of post-emancipation, and a small segment of the Afro-Mexican population becoming involved in politics beginning in the

1980s which led to this renewed interest in the lives of contemporary Afro-Mexicans.

Shelby Godlewski

My research examines Mara Salvatrucha 13 (MS-13), the Salvadoran street gang that originated in Los Angeles, California. This research examines four questions: who are MS-13, what problems currently exist surrounding the gang, what is making it worse, and what can be done to address these problems? MS-13 is a by-product of trauma and social exclusion, a phenomenon made worse by the deportation of MS-13 members from the U.S. to El Salvador. Possible solutions to the problems posed by MS-13 are integration into society through community groups, such as the church, that allow them to have productive lives involved in society.

Taylor Slais

This research focuses on the dirty wars in Argentina and Chile; more specifically, it relates to the use of artistic expression regarding the dirty wars in both countries. I was looking to answer two questions: what were the major forms and uses of artistic expression as related to or stemming from the dirty wars? and are there similarities and differences in these representations between Argentina and Chile? I argue that the forms of art from the respective countries during this period can be grouped into four major categories. That is, art related to the dirty wars was based largely in music, performance and demonstration, written expression, and the visual arts. These forms then fulfilled three major functions; broadly, it was used as a method of healing, a vehicle for memory, and a mode of protest for citizens of both Argentina and Chile, though the purposes of each form differed between the two countries.

Beginning at 10:00 AM

KIRKHOF CENTER 2215/2216

Readings on Spanish American Narratives

Presenters: Abigail Boersma, Melissa Dean, Diana Duarte-Menendez

Mentor: Zulema Moret

Abigail Boersma

"The Beast Inside: Mental Health and Madness Representation in Spanish American Literature"

Mental health is a topic that has been increasingly discussed in media and blogs, although it has been explored in literature and the arts for many years. Typically carrying a negative stigma, the idea of mental health problems has been seen as a sickness, disability, or "madness". Through the works of four Latin American authors I explore their representation of mental health problems and argue that the "sickness" or "la locura" can more often describe the problematic reaction and treatment by society of these individuals.

Melissa Dean

"Cómo la magia 'empodera' a las mujeres".

This essay uses a feminist lens in examining how magic gives power and status to women that would be practically marginalized in the novel *La isla de los amores infinitos* by Daína Chaviano. In this novel, four stories come together due to seemingly mythical and folklorical forces, as well as the women who act as catalysts for these forces. Across the cultures of Spain, Nigeria, China, Cuba, and Miami, across the time span of nearly 200 hundred years, in two parallel lines, magic is revealed to and accessed only by the women of each of these cultures. Because of the contrast of their otherwise mundane lives and the magic they yield, they are able to transcend their lesser status in society as women. Here, magic illustrates something unique about women- a pride in their

combination of strength, autonomy, and female form, as well as their sensitivity and intelligence to what most cannot see.

Diana Duarte-Menendez

“Función simbólica de la vestimenta en ‘El Sur’, ‘El gaucho insufrible’ y *Salón de Belleza*” Hay maneras infinitas en las que se puede representar la moda en la sociedad. El propósito de mi ensayo es mostrar la función simbólica de la vestimenta en tres obras literarias: el cuento “El Sur” de Jorge Luis Borges; el cuento “El gaucho insufrible” de Roberto Bolaño y la novela *Salón de Belleza*, de Mario Bellatín. La moda y la forma de vestir es el máximo poder de expresión de la personalidad en los personajes, transmitiendo mensajes poderosos que existen tras las prendas del vestuario, representando modos de vida, prácticas sociales y mostrando los conflictos de identidad. El vestuario expresa tanto la feminidad como la masculinidad y no solo cumple con el propósito de cubrir el cuerpo sino que comunica modos de vida sociales y construcciones de género

KIRKHOF CENTER 2263

Analysis of Hollywood Remakes

Presenters: Katherine Barnard, Charles Billingsley, Stephanie Kaszewski

Mentor: Kim Roberts

The abundance of movie remakes and reimaginings has noticeably grown in modern day cinema with varying degrees of success. This panel will explore the relevance and impact of remakes, such as their technological advancements and critical reaction. We will examine the various reasons why both live-action and animated films are being remade - specifically focusing on the lack of creativity in today's Hollywood films, the technology that allows such films to be created, and whether these adaptations are able to hold up the expression and themes of the stories on which they are based. Our goal is to question whether or not these remakes are ultimately better than their original forms and if remaking films the best path for production companies to pursue.

Beginning at 11:00 AM

KIRKHOF CENTER 2263

Lessons in Democracy from South Africa

Presenters: Courtney Hartline, Nicholas Moran

Mentor: Jeffrey Kelly Lowenstein

Democracy around the world seems to be fading as many countries elect populist leaders and move in an increasingly authoritarian direction. This presentation will highlight this phenomena while also describing the opposing story of Khulu Radebe, a South African freedom fighter who learned at age 50 that he was a king. As a student activist, prisoner on Robben Island, fighter in the armed struggle in Angola, member of an anti-apartheid cultural group that toured the world, and, now as a king, Radebe has worked tirelessly to bring about the expansion and consolidation of democracy in South Africa. Through defining different types and components democracy, and viewing the development of South Africa's vibrant governmental system as a complicated, but hopeful example for the rest of the world to consider, we hope to inspire fellow students to fight for democracy in their communities and our country.

Beginning at 12:00 PM

KIRKHOF CENTER 2263

Queer Representation in Horror and Cartoons

Presenters: Landon Lomasney, Emily Loper

Mentor: Kim Roberts

This panel will examine how visual media helps to shape and reinforce dominant ideology, specifically in regard to gender norms and heteronormativity. Through a queer theoretical lens, we will discuss both animated cartoons and the horror genre. We will analyze how queer people are represented, queer subtext, and how media representation of these identities are changing as societal ideologies shift. For the discussion on animated cartoons, we will analyze how depictions of gender and sexuality are presented, how this can affect different age groups, and how the visibility of queer identities in animation has changed in recent times. For the discussion on horror, we will examine queer coding and social taboos in horror films that are expressly queer, films with queer subtext, and other horror films. Through this discussion, we argue that visual media reflects societal dominant ideology while also helping to build and reinforce these ideals.

Beginning at 1:00 PM

KIRKHOF CENTER 2215/2216

Race and Gender Representation in Cinema

Presenters: Arianna Jacobs, Matthew Lindstrom, Kara Micallef, Santana Robinson

Mentor: Kim Roberts

This presentation will explore the underrepresentation of women in the film industry, both in front of and behind the camera. We will examine how people of color, women in leading roles, and influencers have been historically overlooked and an unprecedented push for representation and inclusion. This presentation will examine climate, culture, and creative decisions that led to events such as #OscarsSoWhite and consider the creative future of a historically problematic cohort.

KIRKHOF CENTER 2263

Parkinson's Disease Research Panel

Presenters: Katelyn Anthony, Melina Frantzeskakis, Maxwell Okros, Gage Paul

Mentors: Merritt Delano Taylor, 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 10 million people globally. PD is characterized by 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 50-80% of a patient's dopaminergic neurons are lost. It is therefore imperative that a wide range of biological biomarkers are tested for finding a clinical tool to aid and quicken diagnosis. MicroRNAs are small RNAs that regulate gene expression by binding to the 3'-UTR of messenger RNA. Using Firefly Particle Technology, we examined the expression of 65 neurology-related miRNAs in urine of PD patients, comparing them with urine of healthy controls. Many of these microRNAs were detectable in urine, several of which were more

highly expressed in the PD group.

Melina Frantzeskakis

Dopamine neurons arise from the floor plate of the midbrain and are responsible for the development of Parkinson's disease (PD) when they cease to function. Genes that upregulate Nurr1, En1, and Foxa2 promote neuroprotection and neurogenesis of midbrain dopamine neurons (mDA) and have potential use in clinical therapy development. We hypothesized that Nato3(N3) upregulates genes involved in mDA neurogenesis/protection in vivo (chick) and in a mouse midbrain cell line (SN4741). We found N3 upregulated genes involved in neurogenesis/protection. We identified conserved putative phosphorylation sites on N3 and generated Phosphomimetic Nato3 (PM-N3) mutants to determine the effect of phosphorylation on Nato3. We found that PM-N3 causes increased upregulation of these genes compared to N3 in vivo, indicating that N3 influences expression of genes involved in neurogenesis/protection and may be regulated in mDA through phosphorylation. Both findings may have clinical implications in PD.

Maxwell Okros

Parkinson's Disease is characterized by the loss of DA neurons. Nato3 is a bHLH gene expressed in the embryonic midbrain floor plate and is necessary for normal DA neurogenesis. Phosphorylation of other bHLH proteins has been shown to change their action in the developing nervous system. Unpublished data in chick embryos and mouse midbrain cell lines has shown that phospho-mimetic mutations of Nato3 (PM-Nato3) can promote expression of genes associated with DA neurogenesis. Our goal is to determine if wild-type Nato3 co-expressed with cAMP dependent protein kinase A (PKA) can have a similar effect as PM-Nato3 on DA gene expression. Preliminary data supports previous data that over-expression of wt-Nato3 in mouse midbrain cell lines can increase DA genes expression and that the coexpression of wt-Nato3/PKA can further amplify this effect for select DA genes. Further study is being conducted to determine how coexpression of wtNato3 and PKA increases DA gene expression.

Gage Paul

β -synuclein as Treatment for Parkinson's Disease: A Study in Fly

Parkinson's disease (PD) is the second most common neurodegenerative disorder impacting 1-2% of the elderly population. PD is characterized by the loss of dopaminergic neurons, leading primarily to motor impairment. Another hallmark of PD is α -synuclein (α -syn) protein aggregates known as Lewy bodies. Lewy bodies can be targeted by β -synuclein (β -syn) a protein homolog that has shown to reduce α -syn aggregation *in vitro*. In *Drosophila melanogaster*, α -syn is expressed within its nervous system by inserting human α -syn gene into its 3rd chromosome. The flies are fed β -syn peptide in a dose dependent, controlled environment. The effect of Lewy bodies inhibition by β -syn will be assessed by locomotion assays and immunofluorescence microscopy to visualize protein aggregation in fly brain. The use of β -syn to treat motor impairment and α -syn aggregation in fly can potentially lead to novel and noninvasive treatments.

Beginning at 2:00 PM

KIRKHOF CENTER 2215/2216

Dirty Wars in Latin America

Presenters: Jonathan Hufford, Anna Shier, Eric John Szczepaniak

Mentor: David Stark

Jonathan Hufford

This research analyzes the United States' role within Guatemala's dirty war. While it is known that the US intervened in the dirty war, what is less clear are the reasons and implications of such intervention. Guided by questions such as why did the US intervene, was there a hidden motive, and to what extent is US intervention to blame for the dirty war and the lives lost as a result, my research exposes how our nation's dedication to liberty, justice, and democracy often ends at its boarder. Through such interrogation of the past, it becomes clear that the US was not only concerned about the potential spread of communism but geopolitical and economic interests in Guatemala. This led to intervention that not only created the dirty war, but perpetuated it, directly impacting the lives of hundreds of thousands of civilians. The case of Guatemala is a potent example of what lengths the US will go to in order to justify intervention and protect its economic and geopolitical interests.

Anna Shier

This research examines the United States' complicated history with Fidel Castro and Cuba. The guiding question of my investigation was, "Did the United States wage a 'dirty war' against Cuba during and after the Cold War? If so, how and why?" My thesis is based on extensive reading of primary and secondary sources analyzing the Cuban Revolution and the American response to Fidel Castro's communist experiment. I argue that for sixty years, the United States conducted a "dirty war" against Cuba, exercising economic, political, and military power in unorthodox and illegal ways, characterized by interference and destabilization, in an attempt to end Cuba's communist experiment. This immoral exercise of power effectively undermines U.S. claims to the moral high ground in the conflict.

Eric John Szczepaniak

The research examines the lasting legacy of the School of the Americas that has trained members of Latin American militaries since 1946. Now called the West Hemisphere Institute for Security Cooperation (WHINSEC), the school is operated in Fort Benning, Georgia. Over the years, US taxpayers have funded the training of 88,000 foreign military leaders, some of whom would go on to commit atrocities abroad, with little congressional oversight. Does the United States bear any responsibility for the actions perpetrated by graduates of the School of the Americas? My research looks at the questionable tactics employed by the School of the Americas and the effect that public pressure has had on the School's operations. It also reviews the human rights abuses of several of the most notorious graduates and those that are still major political actors in their own countries today.

KIRKHOF CENTER 2263

Social Justice and the Internet

Presenters: Paetyn DeVries, Rachel Dziabuda, Tabatha Grover, Jane Johnston

Mentor: Julia Mason

Paetyn DeVries

While research on video gamers is proliferating, there has been very little research done with video-game streamers specifically, who stream themselves live and thus, bring both their gameplay and their appearance into play. To that end, there have been even fewer studies that analyze how gender stereotypes are perpetuated by not only the video game streamers themselves, but also by their viewers. Using visual and discourse analysis, which help to uncover hidden meanings and interpretations, the vods (videos on demand) and accompanying chats of two popular twitch.tv streamers were analyzed and coded based on themes and topics which emerged at the time of viewing. The analysis of the content of this medium contributes to the understanding of how gender is performed and perpetuated in the developing field of online gaming.

Rachel Dziabuda

The recent rise of the dating application (app) Tinder, has paved the way towards shifting dating from in-person to online. This new age of dating has begun to radically alter the content and intentions of the messages men send to women on the app. For this research, I will analyze the conversations collected on the Instagram account *Tinder Nightmares*, a public repository of Tinder conversations. Utilizing discourse analysis, I will examine how men are performing and adhering to traditional dating scripts, as well as creating new norms for dating rituals within these conversations. This research will explore how using Tinder creates unique experiences compared to exclusively using face-to-face interactions when dating, as well as valuable insights into connections between dating scripts and attitudes towards women.

Tabatha Grover

In the United States, researchers have found that people, particularly youth, look to the Internet to learn about various aspects of sexuality. Research has found that this leads many people to popular pornography and that what youth view correlates with some of their own sexual beliefs and actions. With popular pornography becoming increasingly accessible and having the potential to influence people's sexual beliefs, it is important to examine the potential messages it is portraying. To examine these potential messages, I will conduct a content analysis of the top ten videos and titles from five popular pornography sites. While viewing this content, I will be looking for instances of sexism, violence, and non-consent. This research project will build on previous research regarding the effects of pornography, which continue to transform as the Internet and pornography change.

Jane Johnston

Although many believe the Alt-Right's presence remains on the fringe, they are steadily pushing their xenophobic values into mainstream popularity, especially among young people, using YouTube. Previous feminist research uncovered a clearly intelligent, well-established Alt-Right online presence, characteristics of members of the Alt-Right, and the linguistics of online racism. However, there is much more to be done to thoroughly combat this issue. Guided by discourse analysis, I will determine how certain YouTube videos uphold racist norms online through pernicious and implied language. I will accomplish this by watching and analyzing five videos from two YouTubers who have been identified by the Southern Poverty Law Center as members of the Alt-Right. My research, while on a small scale, will join a growing social movement to combat the Alt-Right's growing popularity by uncovering the messages, beliefs, and values promoted through Alt-Right YouTube content.

Beginning at 3:00 PM

KIRKHOF CENTER 2263

Elements and Purpose of Story Structure

Presenters: Kody Horton, David Sobolak, Benjamin Stevens

Mentor: Kim Roberts

The meaning and significance of a film is divulged through its story structure. Determining the structure of a film is an integral part of the filmmaker's creative process and the choices made will ultimately govern the audience's overall experience. The story structure influences all aspects of the film such as character development and the natural or unnatural story arc. Through an examination of films such as *Memento* and *The Manchurian Candidate*, this panel will explore the organization of a story timeline and how to impact an audience to reach the desired outcome.

Beginning at 5:00 PM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Queer Activist Histories

Presenters: Gabrielle Angel, Amrutha Patil, Brynn Wilfong

Mentor: Jae Basiliere

Gabrielle Angel

The Lesbian Avengers and the Politics of Visibility

During the 1990s, the Lesbian Avengers, a lesbian direct action group, came into existence to promote its primary goals of lesbian visibility and survival. The group emerged from a moment in history where lesbians were increasingly frustrated with doing activist work that was focused on non-lesbian issues. To combat this problem, the Avengers created a brand of activism that placed lesbians as the center-focus. They sought to participate in actions that made the existence and experiences of lesbians clearly visible, a goal they accomplished through engagement in activities such as the Dyke March. This research seeks to analyze how this rhetoric of visibility promoted by the Lesbian Avengers worked to shape the activism done by the group. I use an intersectional framework to analyze primary source materials collected from the Avengers in order to discuss and understand the effect that visibility politics had on the Lesbian Avengers.

Amrutha Patil

The Impact and Influence of Women in the ACT UP Movement

During the AIDS crisis a group called ACT UP was made to raise awareness about AIDS. One issue ACT UP dealt with was the visibility of women within the AIDS crisis. Women were not receiving the proper care for AIDS or even being recognized as affected people. To combat this, members of ACT UP focused direct action onto this issue. It was due to the work of ACT UP, and women in particular, that the government and healthcare professionals took the issue of AIDS as it affects women seriously. Unless groups like ACT UP protested the treatment of women in the AIDS crisis, it would have taken more time to help women. Data for this research will be taken from primary and secondary sources. In this presentation, I will explain the context of women and women's issues within ACT UP and the AIDS Crisis. Then, I will argue that it was with the help of ACT UP's actions that women were able to gain more visibility during the AIDS crisis.

Brynn Wilfong

Avengers (Twenty) Sevenfold: The Legacy of Dyke March

The Lesbian Avengers are a direct action activist group, formed in 1992, whose work addresses issues of lesbian visibility and coalition building. While various activist strategies the Avengers employ have influenced present-day queer activism, none has been more pervasive than the Dyke March, which will celebrate its 27th year in 2019. Only those who identify as "dykes" are encouraged to march in this annual spectacle, which occurs in many major cities worldwide. Because visibility is especially important to the Avengers' activism, urban centers are an ideal environment in which to hold these marches. Employing the use of primary source documents from the Avengers and from Dyke March, I will apply an intersectional lens to ask: how has the Dyke March changed throughout the years? How does an urban locale allow for a successful march? Who can claim the label of dyke, and within this definition, how are effective coalitions built?

Session Abstracts & Schedule

Beginning at 12:00 PM

KIRKHOF CENTER 2215/2216

Applied Machine Learning

Presenters: Allison Bolen, Jonah Bukowsky, Jarred Parr

Mentors: Jared Moore, Gregory Wolffe

Allison Bolen

Colony Collapse Disorder (CCD) (vanEngelsdorp et al., 2010 Neumann and Carreck, 2009) threatens honeybee colonies worldwide. GVSU researchers are involved with a “citizen scientist” monitoring project using hive weight data to identify potential issues with machine learning. Weight data indicates the condition of a hive, and whether it is at risk. However, the amount of data gathered across the project exceeds the capability of human analysis. In this project, we train a machine learning model to automatically identify possible events in the data that require beekeeper annotation. The model helps increase data quality enabling future development of automated models to suggest hive management actions.

Jonah Bukowsky

Every semester, the CIS department at GVSU puts together a class schedule that must conform to many constraints. Constraints encompass many items including classroom availability, room capacity, instructor teaching specialties, and instructor availability. Together these constraints create a challenging scheduling problem taking many hours of human planning and multiple iterations. In my honors thesis, I explore the effectiveness of using a genetic algorithm (GA) to solve this challenging problem. A GA borrows concepts from natural evolution to solve computational problems. During my project, I evolved “good” schedules with the class list from the CIS department in Fall 2018. While algorithm development took a better part of the semester, the GA outputs solutions within a couple hours. This project demonstrates a proof of concept showing that given adequate development time, GAs can be powerful enough to solve complex scheduling problems relieving users of this challenging task.

Jarred Parr

Diabetic individuals suffer from unregulated blood glucose levels. In healthy individuals, the pancreas autonomously assumes the task of glucose regulation via the calibrated production of insulin. The goal of an artificial pancreas, and its accompanying control software, is to accomplish the same result. It is hoped that by utilizing state-of-the-art machine learning algorithms, as applied to the complex task of blood glucose management, many of the associated risks of Type I and Type II diabetes can be mitigated. Using sensor data from the Dexcom Glucose Monitor and from clinical biological simulations, together with high-performance computing systems, this project investigates whether a technique called reinforcement learning can be used to “teach” a machine to accurately and safely deliver the necessary insulin dosages at all times. By relieving individuals of the burden of self-monitoring and delivery, diabetes may become a simpler to manage health condition.

Beginning at 2:00 PM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Classical Myth Reception

Presenters: Abi Avery, Amanda Gasior, Emily Heyburn
Mentor: Diane Rayor

Abi Avery

Classical Myth Reception: Queering Sophocles

Modern adaptations of Sophocles' *Antigone* have covered a wide variety of topics—from philosophy to race to gender roles. My one-act play, *Felicity*, explores the issues of sexuality and gender by using the basic framework of *Antigone*. *Felicity* tells the story of a girl who is fighting for her parents to recognize her transgender brother as just that, a brother, following his death. This project has also involved research, specifically into how to write a play, *Antigone* in modern adaptations and on the modern stage, and conversion therapy in the 21st century. There will be a reading of a short scene of the play, followed by a brief presentation on the intent and need for writing this adaptation.

Amanda Gasior

Classical Myth Reception: Pygmalion Murder Mystery

Criminal Justice and Classics combine to put a spin on myth and mystery. I have done a short story reception of the Pygmalion myth re-imagined as a murder-mystery story and a killer's journal. It is a detailed account of the research on topics such as myths, Roman statue styles and creation, ancient architecture, and some criminological theory. Using these varying backgrounds allows me to show how an ancient myth can transfer to the modern-day criminal justice system. I will read a short section from the story and discuss how I combined the Pygmalion myth and other Classical references into a relevant and interesting modern tale.

Emily Heyburn

Classical Myth Reception: The Power of Persephone

By examining poetic receptions of the *Homeric Hymn to Demeter*—the earliest Greek myth of Demeter and Persephone—from 1980 to the present day, I track the changing values associated with the myth in conjunction with the relevant social movements of the time to show the relevance of Classics in modern contexts and the fluid nature of myth as an art form. I utilize a body of scholarship on the nature of various social movements, the value of story-telling in portraying such movements, and the reception of Classical mythology as well as my own analysis of a body of selected poems in order to articulate the ongoing power of Classical myth not only to captivate audiences, but to grapple with struggles relevant to human existence.

Beginning at 3:00 PM

KIRKHOF CENTER 2215/2216

Psychology Department Oral Session I

Presenters: Jasmine Bechtel, Alexander Denison, Loukas Kondyles, Joshua Thompson

Mentors: Paul Curran, Luke Galen, Benjamin Swets, Todd Williams

Jasmine Bechtel

Attributions for Prosocial Motivation

Individuals can attribute their prosocial behavior to a range of sources such as internal states (intuitions, positive emotions), self-interest, religion, and traits present at birth. In the present study, individuals performed hypothetical prosocial tasks (e.g., likelihood of engaging in prosocial activities, allocating lottery winnings to others, economic decisions involving partners) and made attributions for the origin of their prosociality. Overall prosociality was

attributed to greater internal state motivation and religious motivation and lower self-interested motivation. Generosity was specifically attributed to internal state motivation whereas sharing lottery winnings with others related to attributed religious motivation. Contrary to prevalent social stereotypes, religiosity was only inconsistently related to overall prosociality.

Alexander Denison

On the Limitations and Importance of Researcher Choice in Using Simulated Data for Validation

Simulated data has seen increasing popularity as a method to validate psychological measures in recent years. Data simulation provides advantages over traditional means of data collection in that it requires far fewer resources and allows for the generation of extremely large samples. However, the usefulness of simulated data is heavily dependent on the researcher making accurate assumptions about what the real data looks when simulating data. Using the example of careless responder detection metrics, this talk will discuss the strengths and weaknesses of using simulated data for validation purposes. In addition, the importance of researcher choice, or researcher degrees of freedom, will be discussed in the context of data simulation.

Loukas Kondyles

ZAPPED! The Effect of Brain Stimulation on Sentence Planning

Inherent in language production is the process of planning sentences. People often neglect to plan sentences carefully when under a variety of conditions including time pressure, complex descriptions and predisposed working memory (WM) capacities (Swets et al., 2014). To further investigate the impact of WM on sentence planning, we administered transcranial direct current stimulation (tDCS) to 30 participants to test the impact of stimulated WM on flexibility in sentence planning. The procedure involved subjects viewing differing images requiring them to plan their sentences ahead of time. There were two conditions: a sham/control group and tDCS/experimental group. An electrode was adhered to the dorsolateral prefrontal cortex (DLPFC) with a positive charge, and 2 milliamps of electricity flowed through the pathway created. We hypothesized that in the tDCS condition, enhanced WM capacity would better participants' ability to plan sentences further in advance.

Joshua Thompson

Where are the Women in Competitive Magic the Gathering (MTG)?

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 recently initiated 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 test these explanations, present our results, and discuss their potential implications for understanding women's underrepresentation in other achievement areas.

Beginning at 4:00 PM

KIRKHOF CENTER 2215/2216

Psychology Department Oral Session II

Presenters: Alexis Hansen, James Stewart

Mentors: Lawrence Burns, Tessa Jordan, Todd Williams

Alexis Hansen

Developing a Transcartohistoriography

Transgender issues have come to the forefront of mainstream LGBTQ dialogues, but a critical theoretical lens is often lacking from such narratives. Our study elucidates a more nuanced story by mapping the past, present, and future scholarly topography of transgender studies in order to uncover a roadmap of where the trans perspective is centered, what dialogues appear in the field, and where this area of study is going. Metadata from abstracts and article titles of three literature databases was organized into bibliometric networks that map key topics and shifts in terminology over time. These maps suggest an increase in disciplinary divisions over time but less pathologized conversation. As a pilot study, our research also showcases the value of transgender theoretical framework as a catalyst for major social change and effective political praxis, evidenced by correlations between activism and semantic shifts.

James Stewart

What makes a dog a dog? Is it what's on the inside, how it looks, or how it behaves? By 5-years-old, people believe it's what's on the inside that results in one's identity. We hypothesized that 3-year-olds will believe a change in one's behavior results in an identity change. 3-year-olds, 5-year olds, and adults were told stories and shown pictures of animals that undergo a transformation resulting in either a change of insides, outsides, or behavior. Then participants were asked whether the transformation resulted in an identity change. 5-year-olds and adults were more likely to report a change of insides resulted in an identity change than a change of outsides or behaviors. However, 3-year olds were more likely to report a change in behavior resulted in an identity than a change of inside or outsides. Results are consistent with our hypothesis that 3-year-olds understanding of identity is focused on behavior more so than insides or outsides.

Exhibition of Art Statements

9:00 AM - 5:00 PM

Artist Reception 4:00 PM

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 01

Memories: Reclaimed

Presenter: Annaka Pacino

Mentor: Dellas Henke

A part of the visual art exhibition in library.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 02

VITA Mobile App

Presenter: Rebecca Oppman

Mentor: Vinicius Rebello Lima

Maintaining a consistently healthy lifestyle can be difficult, even in a world containing hundreds of technological “solutions” to this problem. However, none of these “solutions” encompasses the multiple components necessary to a healthy lifestyle; there always seems to be a gap that results in users distancing themselves from these tools. The goal for my Honors senior project was to create an all-inclusive mobile app that contributes to a nourishing and organized routine. To differentiate from other health and fitness apps that exist, I considered all of the features necessary to fulfill the user’s needs. My project strives to solve the prominent problem many face regarding their healthy habits: maintaining consistency. After several steps of research, planning, sketching, and prototyping, VITA was born. Short for “vitalize,” which means to give strength and energy to, VITA is a mobile app providing users with everything they need to keep their healthy lifestyle strong.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 03

Scholarship as Conversation

Presenters: Nicole Heiniger, Nicole Zolynsky

Mentors: Vinicius Rebello Lima, Gayle Schaub

The goal of this project was to try to break down the scholarship as conversation into a couple terms that we thought simplified the framework into simple and straightforward terms. The four terms we chose were: listen, learn, connect, and communicate. To further reinforce the idea that research should be treated as a conversation, we decided to use a speech bubble as our main visual. We incorporated our four main words in the speech bubble to first catch the attention of the viewer and then the speech bubble would lead the individual’s eye down to the explanation.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 04

Image & Letter

Presenter: Lilah Parker

Mentor: Vinicius Rebello Lima

This project worked with the integration between type and image. I used photographs and letterforms to created an

interesting relationship within space.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 05

Image & Word

Presenter: Lilah Parker

Mentor: Vinicius Rebello Lima

This project focused on using principles of contrast, harmony and asymmetric balance to create a dynamic relationship within a defined space. After choosing a single category to place my focus, I investigated various relationships possible between image and word.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 06

Untitled

Presenter: Alyssa Medina

Mentor: Dellas Henke

10 Things I Found Interesting

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 10

Dysmorphia

Presenter: Rachel Britton

Mentor: Gayle Schaub

Dysmorphia reflects the descent from reality into obsessive states of mind. Influenced by Body Dysmorphic Disorder (BDD)--the preoccupation with real or imagined flaws of the physical body that produces behaviors such as hair pulling, skin picking, and looking in mirrors often--I am fascinated with the overwhelming presence of the disorder in people's lives. I distort reality through digital manipulation and lighting effects to reflect the mind in turmoil driven by these hidden and obsessive traits.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 11

Personal Brand Identity

Presenter: Devin Gordon

Mentor: Vinicius Rebello Lima

This is the outcome of my personal branding project from last semester. I first conducted some basic benchmark research, searching for adjectives that describe myself. After sending out a survey to friends and family I formulated a list of adjectives including: organized, collected, and fresh. I wanted a logo that would meet these criteria by designing a logo that is both angular and clean.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 12

Spinning into Control: Wheel-Thrown Forms from GVSU Ceramics Students

Presenter: Ellie Burel

Mentors: Sean Larson, Hoon Lee

This is a collection of pottery created and chosen by students taking Wheel Throwing and Independent Studies

at GVSU during Winter 2019. This class covers projects such as vases, bowls, mugs, plates, teapots as well as objects made from the wheel that are sculptural in nature.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 13

Stargaze

Presenter: Elise Cameron

Mentor: Renee Zettle-Sterling

For this project we were challenged with creating a lidded vessel that pays homage to one of our favorite places in the world. My mind immediately went to my favorite stargazing spot, a tall hill in Island Lake State Park on the east side of the state. This spot is special to me because of the memories I have there, and the general peace and quiet of the spot. In order to honor this spot through my vessel I wanted to convey the feeling of being isolated on top of the hill with the stars, with the dark silhouette of the forest around me. The eye on the top represents laying with your back on the top of the hill, staring into the sky as you are surrounded with the stars. Overall I wanted to portray the feeling of peace and content that I feel when laying on top of that hill in the midst of nature through my vessel.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 14

Untitled

Presenter: Chehallis Robinson

Mentor: Renee Zettle-Sterling

Whenever I visit Lake Michigan with my significant other he spends all of his time searching for rocks in the shallows and collecting the ones that look the most interesting. This labor of love has resulted in a large collection of rocks that are stored in different boxes throughout our home. I designed this vessel with the intention of creating a space to hold these rocks that also represented the experience of plucking them from the lake. The textured copper waves mimic the ripples in the water that distort the rocky sand below. The top is decorated with reeds that extend through the piece down to the exposed roots below.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 15

Self Growth

Presenter: Amanda Bittner

Mentor: Peter Antor

This piece, Self Growth, is an embodiment of how we see and treat ourselves while we're growing and changing. It is a reminder to be gentle on ourselves as we go through changes to make the process easier and free flowing. If you don't allow something to grow, it won't. This includes yourself.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 16

Gyres, Spheres, and Mushrooms

Presenters: Michael Andree, Judith Jankowski, Alexis Wethy

Mentor: Peter Antor

Gyres: Michael Andree

The two cuffs of "Gyres" represent opposing forces each trying to rise above the other. The forces could be dark and light positive or negative or anything the viewer projects them to be. From a personal standpoint, the projected forces are a mix of emotions and feelings I was dealing with. Thoughts like "I can be successful if I just keep

working hard and “Thing would be a lot easier on you if you gave up, you don’t have what it takes anyway.”

Spheres: Judy Jankowski

Exploration of the iconic sphere shape from large to small. Embellished with tube set cubic zirconias to capture light and possibility.

Mushrooms: Alex Wethy

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 17

Spinning into Control: Wheel-Thrown Forms from GVSU Ceramics Students

Presenter: Connor Shea

Mentor: Sean Larson

This is a collection of pottery created and chosen by students taking Wheel Throwing and Independent Studies at GVSU during Winter 2019. This class covers projects such as vases, bowls, mugs, plates, teapots as well as objects made from the wheel that are sculptural in nature.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 18 - DC

Spinning into Control: Wheel-Thrown Forms from GVSU Ceramics Students

Presenter: Michael Tuccini

Mentor: Sean Larson

This is a collection of pottery created and chosen by students taking Wheel Throwing and Independent Studies at GVSU during Winter 2019. This class covers projects such as vases, bowls, mugs, plates, teapots as well as objects made from the wheel that are sculptural in nature.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 19

One for Sorrow

Presenter: Ellyn Hurst

Mentor: Dellas Henke

A 2d exhibit of current projects.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE

Spinning into Control: Wheel-Thrown Forms from GVSU Ceramics Student

Presenter: Alexis Wethy

Mentor: Sean Larson

This is a collection of pottery created and chosen by students taking Wheel Throwing and Independent Studies at GVSU during Winter 2019. This class covers projects such as vases, bowls, mugs, plates, teapots as well as objects made from the wheel that are sculptural in nature.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE

Spinning into Control: Wheel-Thrown Forms from GVSU Ceramics Students

Presenter: Breanna Widmyer

Mentor: Sean Larson

This is a collection of pottery created and chosen by students taking Wheel Throwing and Independent Studies at GVSU during Winter 2019. This class covers projects such as vases, bowls, mugs, plates, teapots as well as objects made from the wheel that are sculptural in nature.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE

Spinning into Control: Wheel-Thrown Forms from GVSU Ceramics Students

Presenter: Amanda Bittner

Mentor: Sean Larson

This is a collection of pottery created and chosen by students taking Wheel Throwing and Independent Studies at GVSU during Winter 2019. This class covers projects such as vases, bowls, mugs, plates, teapots as well as objects made from the wheel that are sculptural in nature.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE

Intact

Presenter: Katelyn Elzinga

Mentor: Renee Zettle-Sterling

Circular forms suggest an all-encompassing structure that focuses on the dichotomies between internal and external, while also suggesting the similarities within. A circle also creates a specific zone of time, space, and perfectionism while having no beginning or end. It is limitless yet confining. It is whole yet empty. I find these concepts to be a metaphor for my life. Searching and circling for resolution to complications in life has set into motion my creating of new things. These circular and radial forms, occurring in various orders, are used to create balance and fulfillment.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE

P5 (Pfart)

Presenter: Morgan Lloyd

Mentor: Renee Zettle-Sterling

Chance and intrigue guide my making process. The objects in my work are altered from circumstances and time unknown to me. Objects, like human beings, are fragile, imperfect and thought-provoking. When I find the objects seen in my work, I am filled with awe. Where did it come from? How did it get here? What happened to it to make it the way it is? I feel empathy for these objects. I ask how can I help this broken object? How can I support them? What do they need? The techniques of stone setting, methods traditionally used to secure gemstones, allow me to connect these objects and explore ideas of interconnectivity, nostalgia and mourning. I question the hierarchy of "traditional" jewelry and what is considered precious. I do as little alteration to these objects as possible, allowing them to carry their history and drama. Within my structures and compositions, the objects are reinvented and have an entirely new life...a new story.

Film / Video Abstracts & Schedule

Beginning at 9:00 AM

MARY IDEMA PEW LIBRARY EXHIBITION SPACE

Careers in Nursing

Presenter: Elisabeth Heikoop

Mentor: Genevieve Elrod

Many nursing students are unsure of the specialty they would like to pursue once they graduate from nursing school. This video is one of two that were originally presented to nursing students to inform them of the career options they will have when they graduate. The video is a compilation of filmed interviews with three different nurses. In these interviews, nurses share what it is like to be a nurse in the specialty they have chosen. Following the original showing, nursing students completed a survey about the effectiveness of the videos. The results of that survey will be shared after the video presentation.

Beginning at 10:00 AM

MARY IDEMA PEW LIBRARY EXHIBITION SPACE

Pass the Salt

Presenters: Noah Miller, Nicholas Sullivan, Adam Varner

Mentor: Kim Roberts

In our video presentation, we explore, relate, and subvert different film-related topics over dinner. In filming our discussion in a working restaurant, we make a point to actively push not only our subjects to their limit, but also the medium with which our project will be presented. We aim to cover three topics. First, a deep-dive into the subjective nature of comedy within film, including the assessment of quality and influences on different types of comedy, such as dark and absurdist. Second, an examination of the history for absurdism and how postmodern cinema has grown to optimally convey absurdist ideas. Finally, we investigate the film industry - specifically how the range of films are flooded with Hollywood-Style filmmaking to the point that any works straying from the formula are considered alien.

Beginning at 11:00 AM

MARY IDEMA PEW LIBRARY EXHIBITION SPACE

The Voice of Cinematography

Presenters: Johnathon Hubert-McLennan, Kory Kearney, Collin Roys

Mentor: Kim Roberts

We will explore how each cinematographer has his or her own dialect of cinematic language that makes their work unique. Decisions such as what lens to use, at what angle, how the camera moves, and the lighting design all convey how the cinematographer perceives the world they are helping to create. The emotional investment of the cinematographer is often reflected in the audience response, which promotes a shared intimate bond between them. Prior to the Oscar Awards, there was discussion of the possibility of the awards for best cinematography to be

presented during commercial breaks to cut down on time. Even though this didn't happen in the awards, because of backlash from the community, the consideration of it shows the lack of care the academy has for cinematography. This is such an important award because as cinematographers we work hard to bring out a story through strong visual storytelling, and being appreciated for our craft pushes us to work to improve our cinematography.

Beginning at 1:00 PM

MARY IDEMA PEW LIBRARY EXHIBITION SPACE

Horror Film Plots, Clichés, and Story Tropes

Presenter: Nicholas Ranger

Mentor: Kim Roberts

This video explores the consequences of re-hashing horror film plots, clichés, and story tropes in contemporary cinema. With interviews and examples from recent horror films, this film critically reviews the contemporary horror film genre and its industry.

Index of Presenters and Mentors

(Sorted by Last Name)

A

Aalderink, Kaley	Student	12:00 p.m.	Kirkhof Center GRR 100
Actis, Nicholas	Student	2:00 p.m.	Henry Hall Atrium 106
Adams, Haley	Student	10:30 a.m.	Kirkhof Center 1142
Aden, Tiana	Student	9:00 a.m.	Henry Hall Atrium 022
Akhurst, Katelyn	Student	1:00 p.m.	Kirkhof Center GRR 028
Alasiri, Abdulah	Student	2:00 p.m.	Henry Hall Atrium 061
Alayont, Feryal	Mentor	10:00 a.m.	Kirkhof Center 2201
Alayont, Feryal	Mentor	10:30 a.m.	Kirkhof Center 2201
Alayont, Feryal	Mentor	11:00 a.m.	Kirkhof Center 2270
Alayont, Feryal	Mentor	12:30 p.m.	Kirkhof Center 2201
Alayont, Feryal	Mentor	4:00 p.m.	Kirkhof Center 2259
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Aldrich, Naomi	Mentor	9:00 a.m.	Kirkhof Center GRR 108
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Alwardt, Megan	Student	10:00am, 1:00pm-3:00pm	Henry Hall Atrium 017
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Amstutz, Claire	Student	11:00 a.m.	Kirkhof Center GRR 115
Anderson, Jacob	Student	1:00 p.m.	Kirkhof Center GRR 110
Anderson, Jordan	Student	11:00 a.m.	Kirkhof Center GRR 115
Anderson, Leah	Student	12:00 p.m.-2:00 p.m.	Kirkhof Center GRR 027
Anderson, Rachel	Mentor	12:00 p.m.	Kirkhof Center 2201
Andree, Michael	Student	4:00 p.m.	Library Exhibition Space 16
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Angelopoulos, Stefany	Student	12:00 p.m.	Kirkhof Center GRR 118
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Anthony, Katelyn	Student	1:00 p.m.	Kirkhof Center 2263
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Antor, Peter	Mentor	4:00 p.m.	Library Exhibition Space 15
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Archiyan, Stella	Student	9:00 a.m., 2:00 p.m.	Kirkhof Center GRR 082
Arndt, Kelly	Student	11:30 a.m.	Kirkhof Center 2270
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Arnold, Elizabeth	Mentor	9:00 a.m.	Henry Hall Atrium 032
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Aultman, Nicole	Student	10:00 a.m., 3:00 p.m.	Kirkhof Center GRR 117
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Avery, Abi	Student	2:00 p.m.	Library Multipurpose Room
Azad, Navjot	Student	9:00 a.m.-11:00 a.m.	Henry Hall Atrium 008

B

Baas, Michael	Student	10:30 a.m.	Kirkhof Center 2201
Bachman, Kierstin	Student	9:00am, 2:00pm, 4:00pm	Henry Hall Atrium 079
Bagnall, Sophia	Student	11:00 a.m.	Kirkhof Center 2201
Baker, Alex	Student	4:00 p.m.	Kirkhof Center GRR 042
Baker, Christopher	Student	11:30 a.m.	Kirkhof Center 1142
Baker, Tyler	Student	9:00 a.m.-12:00 p.m.	Kirkhof Center GRR 080
Bannasch, Rebecca	Student	9:00 a.m.	Kirkhof Center 1142
Banninga, Elaine	Student	10:00 a.m.	Kirkhof Center GRR 035
Barnard, Katherine	Student	10:00 a.m.	Kirkhof Center 2263
Barnes, Jeramie	Student	9:00 a.m.	Henry Hall Atrium 091
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Barnes, Kyle	Mentor	9:00 a.m.	Henry Hall Atrium 012
Barnes, Kyle	Mentor	9:00 a.m.	Henry Hall Atrium 011
Barnes, Kyle	Mentor	9:00 a.m.	Henry Hall Atrium 002
Barnes, Kyle	Mentor	9:00 a.m.	Kirkhof Center GRR 020
Barnes, Kyle	Mentor	9:00 a.m.	Kirkhof Center GRR 019
Barnes, Kyle	Mentor	9:00 a.m.	Kirkhof Center GRR 028
Barnes, Kyle	Mentor	9:00 a.m.	Henry Hall Atrium 013
Barnes, Kyle	Mentor	9:00 a.m.	Kirkhof Center GRR 007
Barnes, Kyle	Mentor	9:00 a.m.	Henry Hall Atrium 010
Barrett, Jessica	Student	10:00 a.m., 3:00 p.m.	Kirkhof Center GRR 117
Barrows, Nathan	Mentor	9:00 a.m.	Henry Hall Atrium 036
Bartolotta, Angelina	Student	11:00 a.m.	Kirkhof Center GRR 098
Barton, Melissa	Student	11:00 a.m.	Kirkhof Center GRR 020
Barton, Melissa	Student	12:00 p.m.	Kirkhof Center GRR 110
Barton, Melissa	Student	1:00 p.m.	Kirkhof Center GRR 102
Basiliere, Jae	Mentor	9:00 a.m.	Kirkhof Center GRR 075
Basiliere, Jae	Mentor	4:00 p.m.	Kirkhof Center 2270

Basiliere, Jae	Mentor	5:00 p.m.	Library Multipurpose Room
Baughn, Melissa	Student	9:00 a.m., 11:00 a.m.	Kirkhof Center GRR 104
Baweja, Jenny	Mentor	9:00 a.m.	Kirkhof Center GRR 030
Baxter, Aaron	Mentor	9:00 a.m.	Henry Hall Atrium 038
Baxter, Aaron	Mentor	9:00 a.m.	Henry Hall Atrium 094
Baxter, Aaron	Mentor	9:00 a.m.	Henry Hall Atrium 074
Beaves, Tatyana	Mentor	9:00 a.m.	Kirkhof Center 2270
Bechtel, Jasmine	Student	2:00 p.m.	Kirkhof Center GRR 008
Bechtel, Jasmine	Student	3:00 p.m.	Kirkhof Center 2215/2216
Bedford, Lauren	Student	9:00 a.m.	Kirkhof Center 2263
Beek, Ian	Student	1:00 p.m.-3:00 p.m.	Kirkhof Center GRR 080
Beissel, Danielle	Student	1:00 p.m.	Henry Hall Atrium 012
Belanger, Sarah	Student	4:00 p.m.	Kirkhof Center GRR 042
Bennett, Bryce	Student	12:00 p.m.	Kirkhof Center GRR 012
Bennett, Stephen	Student	11:30 a.m.	Kirkhof Center 2266
Bennie, Rhianna	Student	4:00 p.m.	Kirkhof Center GRR 037
Bergler, Sarah	Student	1:30 p.m.	Kirkhof Center 1142
Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 058
Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 106
Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 076
Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 031
Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 047
Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 011
Bergsma, Mason	Student	11:00 a.m.	Henry Hall Atrium 076
Berridge, Madison	Student	3:00 p.m.	Kirkhof Center 1142
Bianchi, Laura	Student	4:00 p.m.	Henry Hall Atrium 040
Billingsley, Charles	Student	10:00 a.m.	Kirkhof Center 2263
Billingsley, Charles	Student	11:30 a.m.	Kirkhof Center 2259
Binkley, Hunter	Student	4:00 p.m.	Kirkhof Center 2259
Biolchini, Cecilia	Student	2:30 p.m.	Kirkhof Center 1142
Bittner, Amanda	Student	4:00 p.m.	Library Exhibition Space 15
Bittner, Amanda	Student	4:00 p.m.	Library Exhibition Space
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Blaker, Amy	Student	9:00 a.m.	Kirkhof Center GRR 092
Blanco, Natalia	Student	10:00 a.m.	Kirkhof Center GRR 015
Block, Morgan	Student	10:00 a.m.	Henry Hall Atrium 009
Blunt, Sage	Student	9:30 a.m.	Kirkhof Center 2270
Boersma, Abigail	Student	9:00 a.m. - 11:00 a.m.	Kirkhof Center 2215/2216

Boggiano, Mikaela	Student	12:00 p.m.	Kirkhof Center GRR 095
Bolcer, Kristopher	Student	12:00pm, 2:00pm-5:00pm	Kirkhof Center GRR 039
Bolen, Allison	Student	12:00 p.m.	Kirkhof Center 2215/2216
Bolen, Brett	Mentor	9:00 a.m.	Kirkhof Center GRR 074
Bolen, Brett	Mentor	9:00 a.m.	Henry Hall Atrium 087
Boomershine, Jackson	Student	12:00 p.m.	Kirkhof Center 2266
Booms, Molly	Student	10:00am, 12:00pm-2:00pm	Kirkhof Center GRR 120
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Bos, Jennifer	Student	9:30 a.m.	Kirkhof Center 1142
Braun, Haley	Student	3:00 p.m.	Kirkhof Center GRR 017
Brice, Colleen	Mentor	9:00 a.m.	Kirkhof Center GRR 091
Brice, Colleen	Mentor	2:30 p.m.	Kirkhof Center 2266
Briggs, Sean	Student	12:00pm, 2:00pm-5:00pm	Kirkhof Center GRR 039
Britton, Rachel	Student	4:00 p.m.	Library Exhibition Space 10
Bronicki, David	Student	10:00 a.m.	Henry Hall Atrium 087
Brooks, Malia	Student	12:00 p.m., 3:00 p.m.	Henry Hall Atrium 089
Brouwer, Samantha	Student	11:00 a.m.	Henry Hall Atrium 100
Brower, Mackenzie	Student	12:00pm, 2:00pm-5:00pm	Kirkhof Center GRR 039
Brown, Dan	Mentor	9:00 a.m.	Henry Hall Atrium 061
Brown, Dan	Mentor	9:00 a.m.	Henry Hall Atrium 062
Brown, Dan	Mentor	9:00 a.m.	Henry Hall Atrium 047
Brown, Dan	Mentor	9:00 a.m.	Kirkhof Center GRR 068
Brown, Dan	Mentor	9:00 a.m.	Kirkhof Center GRR 086
Brown, Dan	Mentor	9:00 a.m.	Henry Hall Atrium 060
Brown, Dan	Mentor	9:00 a.m.	Kirkhof Center GRR 079
Brown, Gregory	Mentor	9:00 a.m.	Kirkhof Center GRR 113
Brown, Michelle	Student	9:00 a.m.	Kirkhof Center GRR 061
Brownell, Elena	Student	10:30 a.m.	Kirkhof Center 1142
Browning, Lauren	Student	11am-1pm, 2pm-4pm	Henry Hall Atrium 058
Brummett, Delaney	Student	4:00 p.m.	Henry Hall Atrium 040
Bukowsky, Jonah	Student	12:00 p.m.	Kirkhof Center 2215/2216
Bullen, Diana	Student	9:00 a.m., 1:00 p.m.	Henry Hall Atrium 056
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Burg, Martin	Mentor	9:00 a.m.	Henry Hall Atrium 085
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Burg, Martin	Mentor	9:00 a.m.	Henry Hall Atrium 051
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Burns, Lawrence	Mentor	4:00 p.m.	Kirkhof Center 2215/2216

Bushey, Rachel	Student	2:00 p.m.	Henry Hall Atrium 029
Buskard, Ashley	Student	10:00 a.m.	Kirkhof Center GRR 019
Butler, Brendon	Student	4:00 p.m.	Kirkhof Center GRR 036
Butzer, Lauren	Student	9:00 a.m.	Henry Hall Atrium 028
Bystry, Madison	Student	10:00 a.m.	Kirkhof Center GRR 094

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Cai, Meghan	Mentor	10:00 a.m.	Kirkhof Center 2259
Calvachi, Capriana	Student	9:00 a.m.	Henry Hall Atrium 005
Cameron, Elise	Student	4:00 p.m.	Library Exhibition Space 13
Campbell, Alanna	Student	4:00 p.m.	Henry Hall Atrium 096
Capodilupo, John	Mentor	9:00 a.m.	Henry Hall Atrium 022
Capodilupo, John	Mentor	9:00 a.m.	Kirkhof Center GRR 066
Carene, Lindsey	Student	11am-1pm, 2pm-4pm	Henry Hall Atrium 058
Carle, Jessie	Student	1:30 p.m.	Kirkhof Center 1104
Carriedo Ostos, Roberto	Student	12:00 p.m.	Kirkhof Center GRR 010
Carver, Ashley	Student	10:00 a.m.	Kirkhof Center 1142
Cashion, Emma	Student	11:00 a.m.	Kirkhof Center GRR 099
Castleman, Michaela	Student	1:00 p.m.	Henry Hall Atrium 034
Catton, Noah	Student	10:00 a.m.	Henry Hall Atrium 075
Cejmer, Joleen	Student	9:00 a.m.-11:00 a.m.	Henry Hall Atrium 008
Chartier, Kyle	Student	9:00 a.m.	Kirkhof Center GRR 092
Chen, Hsiao-ping	Mentor	9:00 a.m.	Kirkhof Center GRR 065
Chen, Hsiao-ping	Mentor	9:00 a.m.	Henry Hall Atrium 110
Chen, Hsiao-ping	Mentor	9:00 a.m.	Henry Hall Atrium 023
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Christians, Matthew	Mentor	9:00 a.m.	Kirkhof Center GRR 004
Christians, Matthew	Mentor	9:00 a.m.	Kirkhof Center GRR 018
Christians, Matthew	Mentor	9:00 a.m.	Henry Hall Atrium 007
Chwojnicky, Lauren	Student	12:00pm, 3:00pm-5:00pm	Henry Hall Atrium 083
Chwojnicky, Lauren	Student	10:00 a.m.-12:00 p.m.	Kirkhof Center GRR 080
Ciotti, Angela	Student	2:00 p.m.	Kirkhof Center 1142
Clark, Brett	Student	11:00 a.m.	Henry Hall Atrium 055
Cleary, Ian	Mentor	9:00 a.m.	Kirkhof Center GRR 029
Cleary, Ian	Mentor	9:00 a.m.	Henry Hall Atrium 024
Cleary, Ian	Mentor	9:00 a.m.	Kirkhof Center GRR 087
Cleary, Ian	Mentor	9:00 a.m.	Henry Hall Atrium 097
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Cochrane, Hunter	Student	12:00 p.m.	Henry Hall Atrium 074

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Colgan, Patrick	Mentor	9:00 a.m.	Henry Hall Atrium 072
Collins, Bo	Student	11:00 a.m.	Kirkhof Center GRR 123
Colter, Chance	Student	3:00 p.m.	Kirkhof Center GRR 050
Constantelos, John	Mentor	9:00 a.m.	Kirkhof Center GRR 059
Constantelos, John	Mentor	12:00 p.m.	Kirkhof Center 2270
Cook, Paul	Mentor	9:00 a.m.	Henry Hall Atrium 052
Cook, Paul	Mentor	9:00 a.m.	Henry Hall Atrium 034
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Coviak, Cynthia	Mentor	9:00 a.m.	Henry Hall Atrium 109
Crane, David	Mentor	10:00 a.m.	Kirkhof Center 2266
Crews, Miranda	Student	1:00 p.m.	Kirkhof Center 2266
Croff, Kirsten	Student	12:00 p.m.	Kirkhof Center GRR 095
Crum, Alexandra	Student	3:00 p.m.	Henry Hall Atrium 099
Cunningham, Amanda	Mentor	9:00 a.m.	Henry Hall Atrium 017
Cunningham, Mark	Student	9:00 a.m.	Kirkhof Center GRR 084
Curcuru, Salvatore	Student	9:00 a.m.	Henry Hall Atrium 026
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Damstra, Kelli	Mentor	9:00 a.m.	Kirkhof Center GRR 054
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Danielson, Sigrid	Mentor	9:00 a.m.	Henry Hall Atrium 041
Davis, Rebecca	Mentor	9:00 a.m.	Kirkhof Center GRR 005
Davis, Rebecca	Mentor	9:00 a.m.	Kirkhof Center GRR 046
Davis, Rebecca	Mentor	9:00 a.m.	Kirkhof Center GRR 016
Dawson, Emily	Student	9:00 a.m.	Kirkhof Center GRR 013
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 Vries, Dawn	Mentor	2:00 p.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	2:30 p.m.	Kirkhof Center 1142
De Vries, Dawn	Mentor	3:00 p.m.	Kirkhof Center 1142
DeBerry, Richard	Student	1:00 p.m.	Henry Hall Atrium 050
DeLong, Sean	Student	1:00 p.m.-3:00 p.m.	Henry Hall Atrium 094
DeVries, Paetyn	Student	2:00 p.m.	Kirkhof Center 2263
DeWitt, Melissa	Student	1:00 p.m.	Kirkhof Center GRR 097
Dean, Kristy	Mentor	9:00 a.m.	Kirkhof Center GRR 048
Dean, Melissa	Student	2:00 p.m.	Kirkhof Center GRR 068
Dean, Melissa	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center 2215/2216
Deaner, Robert	Mentor	3:00 p.m.	Kirkhof Center 2270
Debruine, Michael	Student	2:00 p.m.	Kirkhof Center 1142
Deemer, Gregory	Student	9:00 a.m.-2:00 p.m.	Kirkhof Center GRR 031
Delano Taylor, Merritt	Mentor	1:00 p.m.	Kirkhof Center 2263
Denison, Alexander	Student	3:00 p.m.	Kirkhof Center 2215/2216
Desjarlais, Taylor	Student	10:00 a.m.	Henry Hall Atrium 009
Dewey, Nicholas	Student	2:00 p.m.	Henry Hall Atrium 031
Dewicki, Michael	Student	12:00 p.m.	Kirkhof Center GRR 095
Dick, Sarah	Student	11:00 a.m.	Kirkhof Center GRR 101
Dillard, Amanda	Mentor	9:00 a.m.	Kirkhof Center GRR 064
Dillard, Amanda	Mentor	9:00 a.m.	Henry Hall Atrium 027
Dixon, Christianna	Student	9:00 a.m.	Kirkhof Center 2263
Dlugos, Molly	Student	12:00 p.m.	Henry Hall Atrium 032
Dobbin, Kourtney	Student	9:00 a.m.	Kirkhof Center 2259
Donahue, Allison	Student	9:00 a.m.	Henry Hall Atrium 110
Donahue, Allison	Student	10:30 a.m.	Kirkhof Center 2259
Dondzila, Christopher	Mentor	9:00 a.m.	Henry Hall Atrium 089
Dore, Ashley	Student	12:00 p.m.	Kirkhof Center GRR 100
Douglas, Holly	Student	12:30 p.m.	Kirkhof Center 1142
Dowd, Zachary	Student	9:00 a.m.	Henry Hall Atrium 013
Doyon-Martin, Jacquelynn	Mentor	9:00 a.m.	Kirkhof Center GRR 057
Dreslinski, Mary	Student	12:00 p.m.	Kirkhof Center GRR 101
Duarte-Menendez, Diana	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center 2215/2216
Dunlap, Lucretia	Student	11am-1pm, 3pm-5pm	Henry Hall Atrium 063
Durell, Patricia	Student	3:00 p.m.	Henry Hall Atrium 044
Dvorchak, Danielle	Student	12:00 p.m.	Kirkhof Center GRR 097

Dykes, Bradford	Mentor	9:00 a.m.	Kirkhof Center GRR 081
Dykstra, Sydney	Student	10:00am, 12:00pm-2:00pm	Kirkhof Center GRR 120
Dziabuda, Rachel	Student	2:00 p.m.	Kirkhof Center 2263

E

Edwards, Jordan	Student	11:00 a.m.	Kirkhof Center GRR 098
Eisen, Jessica	Student	2:00 p.m.	Kirkhof Center 1142
El-Kildani, Issa	Student	9:00 a.m.	Kirkhof Center GRR 043
Elders, Zachary	Student	2:00 p.m.	Kirkhof Center 1142
Elliott, Emily	Student	4:00 p.m.	Henry Hall Atrium 070
Elrod, Genevieve	Mentor	9:00 a.m.	Henry Hall Atrium 042
Elrod, Genevieve	Mentor	9:00 a.m.	Library Exhibition Space
Elzinga, Katelyn	Student	4:00 p.m.	Library Exhibition Space
Erickson, Katelyn	Student	9:00 a.m., 11:00 a.m.	Henry Hall Atrium 011
Eslick, Ethan	Student	9:30 a.m.	Kirkhof Center 2270
Evans, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 113
Evans, Timothy	Mentor	9:00 a.m.	Henry Hall Atrium 099

F

Farias, Daniel	Student	12:00 p.m.-2:00 p.m.	Henry Hall Atrium 107
Fateye, Babasola	Mentor	9:00 a.m.	Henry Hall Atrium 046
Fateye, Babasola	Mentor	9:00 a.m.	Kirkhof Center GRR 125
Fateye, Babasola	Mentor	9:00 a.m.	Henry Hall Atrium 105
Feasel, Lauren	Student	1:00 p.m.	Kirkhof Center GRR 116
Feedback, Matthew	Mentor	9:00 a.m.	Kirkhof Center GRR 026
Feedback, Matthew	Mentor	2:00 p.m.	Kirkhof Center 2270
Ferer, Kiley	Student	2:00 p.m.-5:00 p.m.	Kirkhof Center GRR 063
Ferrera, Emily	Student	10:30 a.m.	Kirkhof Center 2266
Ferris, Kathryn	Student	1:00 p.m.	Kirkhof Center GRR 028
Filips, Leigha	Student	12:00 p.m.	Kirkhof Center GRR 118
Finch, Keagan	Student	9:00 a.m.	Henry Hall Atrium 091
Fish, Erin	Student	10:00am, 2:00pm-5:00pm	Kirkhof Center GRR 124
Fish, Kyle	Student	11:00 a.m.	Henry Hall Atrium 081
Fisher, Hannah	Student	2:00 p.m.	Kirkhof Center GRR 113
Flandreau, Elizabeth	Mentor	9:00 a.m.	Henry Hall Atrium 009
Flores, Diego	Student	1:00 p.m.	Henry Hall Atrium 048
Ford, Alyssa	Student	11am-1pm, 2pm-4pm	Henry Hall Atrium 058
Fox, Collin	Student	10:00 a.m.	Kirkhof Center GRR 001
Foy, Nicole	Student	10:00 a.m.	Kirkhof Center GRR 107
Frantzeskakis, Melina	Student	1:00 p.m.	Kirkhof Center 2263

Freiburger, Andrew	Student	9:30 a.m.	Kirkhof Center 2201
Fridley, Makenzie	Student	9:30 a.m.	Kirkhof Center 1142
Friedlmeier, Mihaela	Mentor	3:00 p.m.	Kirkhof Center 2259
Friedman, Elizabeth	Student	10:00 a.m.	Kirkhof Center GRR 094
Fritz, Emily	Student	9:30 a.m.	Kirkhof Center 1104
Frost, Kevin	Student	10:00 a.m.	Henry Hall Atrium 014
Furton, Douglas	Mentor	9:00 a.m.	Kirkhof Center GRR 077

G

Gable, Eric	Student	2:00 p.m.	Kirkhof Center 2259
Gabrosek, John	Mentor	9:00 a.m.	Kirkhof Center GRR 103
Gabrosek, John	Mentor	9:00 a.m.	Kirkhof Center 2259
Gabrosek, John	Mentor	9:30 a.m.	Kirkhof Center 2266
Gabrosek, John	Mentor	9:30 a.m.	Kirkhof Center 2259
Gabrosek, John	Mentor	9:30 a.m.	Kirkhof Center 2270
Gabrosek, John	Mentor	10:00 a.m.	Kirkhof Center 2270
Gabrosek, John	Mentor	10:30 a.m.	Kirkhof Center 2270
Gabrosek, John	Mentor	11:30 a.m.	Kirkhof Center 2270
Gabrosek, John	Mentor	11:30 a.m.	Kirkhof Center 2266
Gabrosek, John	Mentor	1:30 p.m.	Kirkhof Center 2259
Gabrosek, John	Mentor	1:30 p.m.	Kirkhof Center 2266
Gabrosek, John	Mentor	1:30 p.m.	Kirkhof Center 2270
Gabrosek, John	Mentor	3:00 p.m.	Kirkhof Center 2201
Galea, Jonathan	Student	9:00 a.m.	Kirkhof Center GRR 033
Galen, Luke	Mentor	9:00 a.m.	Kirkhof Center GRR 008
Galen, Luke	Mentor	3:00 p.m.	Kirkhof Center 2215/2216
Galla, Kylie	Student	9:00 a.m., 12:00 p.m.	Henry Hall Atrium 103
Gallaher, Kaylie	Student	1:00 p.m.	Kirkhof Center 2201
Galligan, Laura	Student	9:00 a.m.	Henry Hall Atrium 042
Garcia, Kendra	Student	9:00 a.m.	Kirkhof Center 2201
Garcia, Kendra	Student	9:00 a.m.	Library Multipurpose Room
Garnaatt, Michael	Student	1:00 p.m.-3:00 p.m.	Henry Hall Atrium 094
Gasior, Amanda	Student	2:00 p.m.	Library Multipurpose Room
Gawthorp, Hannah	Student	12:30 p.m.	Kirkhof Center 1142
Genslak, Megan	Student	9:30 a.m.	Kirkhof Center 2266
Gerritsen, Lauren	Student	10:00 a.m.	Henry Hall Atrium 051
Giammalva, Olivia	Student	10:00 a.m.	Kirkhof Center GRR 007
Gibbons, Jenna	Student	1:30 p.m.	Kirkhof Center 2266
Gibson, Emily	Student	3:00 p.m.	Kirkhof Center GRR 050

Gilbert, Hanali	Student	11:00 a.m.	Kirkhof Center GRR 064
Gildea, Devon	Student	9:00 a.m.-11:00 a.m.	Henry Hall Atrium 104
Gillham, Alta	Student	12:00 p.m.	Kirkhof Center GRR 011
Glass, Stephen	Mentor	9:00 a.m.	Kirkhof Center GRR 127
Glass, Stephen	Mentor	9:00 a.m.	Kirkhof Center GRR 006
Godfrey, Alexis	Student	10:00 a.m.	Kirkhof Center GRR 001
Godfrey, Alexis	Student	11:00 a.m.	Kirkhof Center GRR 108
Godlewski, Shelby	Student	9:00 a.m.	Library Multipurpose Room
Goerisch, Denise	Mentor	2:30 p.m.	Kirkhof Center 2259
Golden, Xavier	Student	9:00 a.m.	Kirkhof Center GRR 075
Goldstein, Julie	Mentor	11:00 a.m.	Kirkhof Center 2266
Goldstein, Julie	Mentor	11:30 a.m.	Kirkhof Center 2259
Gomez, Drake	Student	3:00 p.m.	Kirkhof Center GRR 055
Gonzalez, Ricardo	Student	3:00 p.m.	Kirkhof Center GRR 017
Goodrich, Leah	Student	9:00 a.m., 1:00 p.m.	Henry Hall Atrium 056
Gordon, Devin	Student	4:00 p.m.	Library Exhibition Space 11
Graham, Doug	Mentor	9:00 a.m.	Henry Hall Atrium 074
Green, Jillian	Student	9:00 a.m.	Kirkhof Center GRR 022
Green, Justin	Student	10:30 a.m.	Kirkhof Center 2270
Green-Jackson, Lavar	Student	11:00 a.m.	Kirkhof Center GRR 090
Greene, Ashton	Student	10am, 12pm-2pm	Kirkhof Center GRR 120
Greer, Gary	Mentor	4:30 p.m.	Kirkhof Center 2270
Gretzinger, Derik	Student	11:30 a.m.	Kirkhof Center 2266
Griffin, Griff	Mentor	9:00 a.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	9:30 a.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	10:00 a.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	10:30 a.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	11:00 a.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	11:30 a.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	12:00 p.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	1:00 p.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	1:30 p.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	2:00 p.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	2:30 p.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	3:00 p.m.	Kirkhof Center 1104
Griffin, Griff	Mentor	3:30 p.m.	Kirkhof Center 2270
Grobbel, Elizabeth	Student	12:00 p.m.	Kirkhof Center GRR 127
Gross, Emily	Student	9:00 a.m.	Kirkhof Center 2270

Gross, Jennifer	Mentor	9:00 a.m.	Henry Hall Atrium 063
Groszkiewicz, Joseph	Student	3:00 p.m.	Henry Hall Atrium 098
Grover, Tabatha	Student	2:00 p.m.	Kirkhof Center 2263
Grube, Jonathon	Student	2:00 p.m.	Henry Hall Atrium 013
Gruppen, Ashley	Student	9:00 a.m.	Kirkhof Center 1142
Gulgin, Heather	Mentor	9:00 a.m.	Kirkhof Center GRR 110
Gulgin, Heather	Mentor	9:00 a.m.	Kirkhof Center GRR 102
Gunderson, Bailee	Student	1:00 p.m.	Kirkhof Center 2266
Guthrie, Jillian	Student	9:00 a.m.	Kirkhof Center GRR 088
Gwasdacus, Jeffrey	Student	2:30 p.m.	Kirkhof Center 2270

H

Haley, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 033
Haley, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 051
Hall, Aaron	Student	1:00 p.m.	Henry Hall Atrium 082
Hall, Mackenzie	Student	12:00 p.m.	Henry Hall Atrium 112
Haller, Audrie	Student	2:30 p.m.	Kirkhof Center 1142
Hampton, Halie	Student	4:00 p.m.	Kirkhof Center GRR 023
Hansen, Alexis	Student	3:30 p.m.	Kirkhof Center 2266
Hansen, Alexis	Student	4:00 p.m.	Kirkhof Center 2215/2216
Hardy, Kayla	Student	11:00 a.m.	Kirkhof Center 2266
Haring, Quintin	Student	10:00 a.m.	Kirkhof Center GRR 062
Harrah, Ashleigh	Student	12:00 p.m.	Kirkhof Center GRR 049
Harris, Kati	Student	9:00 a.m.	Kirkhof Center 1142
Harrison, Emily	Student	1:30 p.m.	Kirkhof Center 1142
Harry, Taylor	Student	1:00 p.m.	Kirkhof Center GRR 127
Hart, Dawn	Mentor	9:00 a.m.	Henry Hall Atrium 004
Hart, Dawn	Mentor	9:00 a.m.	Henry Hall Atrium 112
Hart, Dawn	Mentor	9:00 a.m.	Henry Hall Atrium 108
Hart, Dawn	Mentor	9:00 a.m.	Henry Hall Atrium 095
Hart, Dawn	Mentor	9:00 a.m.	Henry Hall Atrium 059
Hart, Delaney	Student	2:00 p.m.	Henry Hall Atrium 108
Hart, Liam	Student	9:00 a.m.-5:00 p.m.	Kirkhof Center GRR 006
Hart, Nicholas	Student	12:00 p.m.	Kirkhof Center 1104
Hartline, Courtney	Student	11:00 a.m.	Kirkhof Center 2263
Hartline, Courtney	Student	12:30 p.m.	Kirkhof Center 2266
Hasan, Khairun	Student	10:00 a.m.	Kirkhof Center GRR 121
Hauch, Jessica	Student	1:00 p.m.	Kirkhof Center 1104
Hayes, Halle	Student	12:00 p.m.	Kirkhof Center GRR 097

Hayes, Hogan	Student	12:00 p.m.	Kirkhof Center GRR 118
Hedges, Kristin	Mentor	9:00 a.m.	Kirkhof Center GRR 010
Hedges, Kristin	Mentor	9:00 a.m.	Henry Hall Atrium 005
Hedges, Kristin	Mentor	9:00 a.m.	Kirkhof Center GRR 044
Hefferan, Tara	Mentor	9:00 a.m.	Henry Hall Atrium 029
Hefferan, Tara	Mentor	2:30 p.m.	Kirkhof Center 2201
Heikoop, Elisabeth	Student	9:00 a.m.	Library Exhibition Space
Heiniger, Nicole	Student	4:00 p.m.	Library Exhibition Space 03
Hendricks, Sam	Student	4:30 p.m.	Kirkhof Center 2266
Henegar, Kyle	Student	12:00 p.m.	Kirkhof Center GRR 012
Henke, Dallas	Mentor	4:00 p.m.	Library Exhibition Space 01
Henke, Dallas	Mentor	4:00 p.m.	Library Exhibition Space 19
Henke, Dallas	Mentor	4:00 p.m.	Library Exhibition Space 06
Hepfner, Hailey	Student	9:00 a.m.	Kirkhof Center GRR 019
Hermans, Holly	Student	3:00 p.m.	Kirkhof Center GRR 116
Hernandez, Alexandra	Student	9:00 a.m.	Kirkhof Center GRR 093
Herold, Jessica	Student	1:30 p.m.	Kirkhof Center 2266
Herrington, Deborah	Mentor	9:00 a.m.	Kirkhof Center GRR 082
Heyburn, Emily	Student	2:00 p.m.	Library Multipurpose Room
Higbea, Raymond	Mentor	9:00 a.m.	Henry Hall Atrium 068
Hige, Alison	Student	9:00 a.m.	Kirkhof Center GRR 109
Hodges, Hannah	Student	3:00 p.m.	Kirkhof Center GRR 105
Hoemke, Kelsy	Student	11:30 a.m.	Kirkhof Center 1142
Hoezee, Mitchell	Student	9:00 a.m.	Kirkhof Center 2259
Hoffman, Mark	Mentor	9:00 a.m.	Henry Hall Atrium 018
Hoffman, Mark	Mentor	9:00 a.m.	Kirkhof Center GRR 069
Hoffman, Mark	Mentor	9:00 a.m.	Kirkhof Center GRR 013
Hoffman, Mark	Mentor	9:00 a.m.	Kirkhof Center GRR 060
Hoffman, Mark	Mentor	9:00 a.m.	Kirkhof Center GRR 017
Hoffman, Mark	Mentor	9:00 a.m.	Kirkhof Center GRR 062
Hoffman, Mark	Mentor	9:00 a.m.	Henry Hall Atrium 019
Hoffman, Mark	Mentor	9:00 a.m.	Kirkhof Center GRR 012
Hoffman, Mark	Mentor	9:00 a.m.	Henry Hall Atrium 050
Hoffman, Mark	Mentor	9:00 a.m.	Kirkhof Center GRR 078
Hoffman, Mark	Mentor	9:00 a.m.	Kirkhof Center GRR 015
Hoffman, Mark	Mentor	9:00 a.m.	Henry Hall Atrium 067
Hoffman, Mark	Mentor	9:00 a.m.	Henry Hall Atrium 035
Hoffman, Mark	Mentor	9:00 a.m.	Henry Hall Atrium 091

Hoffman, Mark	Mentor	9:00 a.m.	Kirkhof Center GRR 014
Holland, Jordyn	Student	3:00 p.m.	Kirkhof Center GRR 051
Hollister, Robert	Mentor	9:00 a.m.	Kirkhof Center GRR 107
Holmes, Derek	Student	9:00 a.m.-12:00 p.m.	Kirkhof Center GRR 083
Holyfield, Hope	Student	2:00 p.m.	Henry Hall Atrium 027
Hon, Sisi	Student	3:00 p.m.	Kirkhof Center GRR 088
Hooper, Barbara	Mentor	9:00 a.m.	Kirkhof Center GRR 109
Hooton, Hannah	Student	9:00 a.m.	Henry Hall Atrium 028
Hoover, Halle	Student	12:00 p.m.-2:00 p.m.	Kirkhof Center GRR 112
Hoover, Jessica	Student	1:00 p.m.	Henry Hall Atrium 025
Horton, Kody	Student	3:00 p.m.	Kirkhof Center 2263
Hosea, Mark	Student	11:00 a.m.	Kirkhof Center GRR 123
Houghton-Rahrig, Lori	Mentor	9:00 a.m.	Kirkhof Center GRR 071
Houtman, Sophia	Student	3:00 p.m.	Kirkhof Center 1142
Howcroft, Victoria	Student	11:00 a.m.	Kirkhof Center GRR 115
Hower, Spencer	Student	9:00 a.m.	Henry Hall Atrium 077
Hoxie, Jennifer	Student	4:00 p.m.	Kirkhof Center 2259
Hubert-McLennan, Johnathon	Student	11:00 a.m.	Library Exhibition Space
Huehn, Brendan	Student	9:00 a.m., 1:00 p.m.	Henry Hall Atrium 056
Huey, Amorak	Mentor	10:30 a.m.	Kirkhof Center 2266
Hufford, Jonathan	Student	2:00 p.m.	Kirkhof Center 2215/2216
Hughes, Tiesjwan	Student	12:00 p.m.	Kirkhof Center GRR 048
Hunt, Alexandra	Student	10:00 a.m.	Henry Hall Atrium 067
Hunt, Jodee	Mentor	9:00 a.m.	Henry Hall Atrium 103
Hunt, Jodee	Mentor	9:00 a.m.	Kirkhof Center GRR 114
Hurst, Ellyn	Student	4:00 p.m.	Library Exhibition Space 19

I

Inosencio, Miranda	Student	10:30 a.m.	Kirkhof Center 2270
Irwin, Grace	Student	2:00 p.m.	Henry Hall Atrium 047

J

Jacobs, Arianna	Student	1:00 p.m.	Kirkhof Center 2215/2216
Jankowski, Judith	Student	4:00 p.m.	Library Exhibition Space 16
Jenkins, Sabrina	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center GRR 003
Jeske, Kayla	Student	12:00 p.m.	Kirkhof Center GRR 098
Jockusch, Tim	Student	10:00 a.m.	Kirkhof Center 2270
Johnson, Delaney	Student	10:00 a.m.	Henry Hall Atrium 088
Johnson, Jessica	Student	9:00 a.m.	Kirkhof Center GRR 013
Johnson, Kari	Student	3:00 p.m.	Kirkhof Center GRR 103

Johnson, Kayla	Student	3:00 p.m.	Kirkhof Center GRR 030
Johnston, Jane	Student	2:00 p.m.	Kirkhof Center 2263
Jones, Amanda	Student	12:00 p.m.-2:00 p.m.	Henry Hall Atrium 107
Jones, Hailey	Student	1:00 p.m.	Kirkhof Center 2259
Jones, Michael	Student	10:00 a.m.	Kirkhof Center GRR 035
Jones, Nicholas	Student	9:00 a.m.	Kirkhof Center GRR 074
Jordan, Tessa	Mentor	4:00 p.m.	Kirkhof Center 2215/2216
Joswick, Patrick	Student	11:00 a.m.	Henry Hall Atrium 109
Juzwiak, Jordan	Student	9:00 a.m.-12:00 p.m.	Henry Hall Atrium 020

K

Kaled, Kristen	Student	9:00 a.m.	Kirkhof Center GRR 005
Kalusniak, Rachel	Student	12:00 p.m.	Kirkhof Center 2259
Karrip, Ryan	Student	9:00am, 2:00pm, 4:00pm	Henry Hall Atrium 079
Kashian, Charissa	Student	10:00 a.m.	Henry Hall Atrium 036
Kaszewski, Stephanie	Student	10:00 a.m.	Kirkhof Center 2263
Kavanagh, Kolton	Student	9:00 a.m.	Kirkhof Center 1104
Kavner, Lauren	Student	2:00 p.m.	Kirkhof Center GRR 076
Kearney, Kory	Student	11:00 a.m.	Library Exhibition Space
Kehren, Taylor	Student	10:00am, 12:00pm-2:00pm	Kirkhof Center GRR 120
Kelley, Ellise	Student	9:30 a.m.	Kirkhof Center 1142
Kelly, Hannah	Student	12:00pm, 2:00pm-4:00pm	Henry Hall Atrium 023
Kelly, Keyley	Student	3:30 p.m.	Kirkhof Center 2201
Kelly, Madelynn	Student	3:00 p.m.	Henry Hall Atrium 059
Kelly Lowenstein, Jeffrey	Mentor	10:30 a.m.	Kirkhof Center 2259
Kelly Lowenstein, Jeffrey	Mentor	11:00 a.m.	Kirkhof Center 2263
Kendra, Quinn	Student	9:00 a.m., 1:00 p.m.	Kirkhof Center GRR 069
Kendrick, Joseph	Student	10:30 a.m.	Kirkhof Center 2201
Keough, Lauren	Mentor	9:00 a.m.	Henry Hall Atrium 045
Keough, Lauren	Mentor	10:00 a.m.	Kirkhof Center 2201
Keough, Lauren	Mentor	10:30 a.m.	Kirkhof Center 2201
Keough, Lauren	Mentor	11:00 a.m.	Kirkhof Center 2270
Keough, Lauren	Mentor	12:30 p.m.	Kirkhof Center 2201
Keough, Lauren	Mentor	4:00 p.m.	Kirkhof Center 2259
Khalifa, Marissa	Student	12:30 p.m.	Kirkhof Center 1142
Khatib, Ahmad	Student	9am-12pm, 2pm-4pm	Kirkhof Center GRR 070
Khoo, Sok Kean	Mentor	9:00 a.m.	Henry Hall Atrium 048
Khoo, Sok Kean	Mentor	9:00 a.m.	Kirkhof Center GRR 085
Khoo, Sok Kean	Mentor	9:00 a.m.	Kirkhof Center GRR 049

Khoo, Sok Kean	Mentor	9:00 a.m.	Kirkhof Center GRR 084
Khoo, Sok Kean	Mentor	9:00 a.m.	Kirkhof Center GRR 130
Khoo, Sok Kean	Mentor	1:00 p.m.	Kirkhof Center 2263
Kilburn, Whitt	Mentor	9:00 a.m.	Kirkhof Center GRR 038
Kipp, Brian	Mentor	9:00 a.m.	Kirkhof Center GRR 056
Kirkendall, Eric	Student	10:00 a.m.	Kirkhof Center GRR 035
Kirshman, Hannah	Student	2:00 p.m.	Kirkhof Center GRR 087
Kirwin, Regina	Student	9:00 a.m.	Kirkhof Center GRR 054
Kiser, Shelby	Student	9:00 a.m.	Henry Hall Atrium 021
Kittle, Tristan	Student	2:00 p.m.	Kirkhof Center GRR 086
Klausing, Kadison	Student	10:30 a.m.	Kirkhof Center 1142
Klok, Kyle	Student	10:00 a.m.	Henry Hall Atrium 002
Kneeshaw, Tara	Mentor	9:00 a.m.	Henry Hall Atrium 106
Kneeshaw, Tara	Mentor	9:00 a.m.	Henry Hall Atrium 065
Knight, Hannah	Student	9:00 a.m.	Kirkhof Center GRR 019
Knowlton, Jacob	Student	11:00 a.m.	Kirkhof Center GRR 089
Kondyles, Loukas	Student	3:00 p.m.	Kirkhof Center 2215/2216
Kooiker, Brittani	Student	4:00 p.m.	Kirkhof Center GRR 053
Kooy, Taylor	Student	1:30 p.m.	Kirkhof Center 2266
Kosnik, Brendan	Student	4:30 p.m.	Kirkhof Center 2270
Kosnik, Emily	Student	9:00 a.m.	Kirkhof Center GRR 044
Kovacs, Dalila	Mentor	9:00 a.m.	Henry Hall Atrium 054
Kovacs, Dalila	Mentor	9:30 a.m.	Kirkhof Center 2201
Kovacs, Dalila	Mentor	2:30 p.m.	Kirkhof Center 2270
Kovaly, Brittany	Student	1:00 p.m.	Henry Hall Atrium 046
Kozan, Kahrlee	Student	10:00 a.m.	Kirkhof Center 2259
Krause, Bianca	Student	11:00 a.m.	Henry Hall Atrium 080
Krause, Courtney	Student	9:00 a.m.	Kirkhof Center GRR 071
Krieger, Mackenzi	Student	12:00 p.m.	Kirkhof Center 1142
Krikke, James	Mentor	9:00 a.m.	Henry Hall Atrium 054
Krikke, James	Mentor	9:30 a.m.	Kirkhof Center 2201
Kuipers, Jane	Student	1:30 p.m.	Kirkhof Center 2259
L			
LaPlatt, Megan	Student	3:00 p.m.	Henry Hall Atrium 098
Laduca, Andrew	Student	1:00 p.m.-3:00 p.m.	Henry Hall Atrium 049
Langenberg, Alyssa	Student	9:00 a.m.	Henry Hall Atrium 027
Lantz, Andrew	Mentor	9:00 a.m.	Kirkhof Center GRR 122
Larson, Anne	Student	9:00 a.m.-12:00 p.m.	Henry Hall Atrium 084

Larson, Eleanore	Student	9:00 a.m., 1:00 p.m.	Henry Hall Atrium 056
Larson, Eleanore	Student	10:00 a.m.	Henry Hall Atrium 072
Larson, Sean	Mentor	4:00 p.m.	Library Exhibition Space
Larson, Sean	Mentor	4:00 p.m.	Library Exhibition Space 12
Larson, Sean	Mentor	4:00 p.m.	Library Exhibition Space 17
Larson, Sean	Mentor	4:00 p.m.	Library Exhibition Space 18
Larson, Sean	Mentor	4:00 p.m.	Library Exhibition Space
Larson, Sean	Mentor	4:00 p.m.	Library Exhibition Space
Latshaw, Kelley	Student	9:00 a.m.	Kirkhof Center GRR 093
Laughlin, Jared	Student	9:00 a.m., 11:00 a.m.	Kirkhof Center GRR 104
Lauretti, Nicole	Student	3:00 p.m.	Kirkhof Center 1142
Lautner, Matthew	Student	9:00 a.m.-11:00 a.m.	Henry Hall Atrium 104
Layman, Nicholas	Student	12:30 p.m.	Kirkhof Center 2201
Lee, Allisyn	Student	12:00 p.m.	Kirkhof Center GRR 101
Lee, Hoon	Mentor	4:00 p.m.	Library Exhibition Space 12
Lenkey, Laura	Mentor	9:00 a.m.	Henry Hall Atrium 001
Lesniak, Joseph	Student	1:30 p.m.	Kirkhof Center 2259
Lewis, Gabrielle	Student	2:00 p.m.	Kirkhof Center GRR 126
Lewis, Gabrielle	Student	1:30 p.m.	Kirkhof Center 2201
Lillard, Tyrese	Student	3:00 p.m.	Kirkhof Center GRR 119
Lindgren, Randy	Student	12:00 p.m.	Henry Hall Atrium 111
Lindstrom, Matthew	Student	1:00 p.m.	Kirkhof Center 2215/2216
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 027
Lioubimtseva, Elena	Mentor	11:00 a.m.	Kirkhof Center 2215/2216
Liu, Ruijie	Mentor	9:00 a.m.	Henry Hall Atrium 015
Liu, Ruijie	Mentor	9:00 a.m.	Kirkhof Center GRR 089
Lizzo, Rose	Student	11:00 a.m.	Henry Hall Atrium 092
Lloyd, Morgan	Student	4:00 p.m.	Library Exhibition Space
Lobdell, Lesley	Student	4:00 p.m.	Henry Hall Atrium 078
Lomasney, Landon	Student	12:00 p.m.	Kirkhof Center 2263
Lombardo, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 001
Lombardo, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 002
Lombardo, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 104
Loper, Emily	Student	12:00 p.m.	Kirkhof Center 2263
Lord, Richard	Mentor	9:00 a.m.	Henry Hall Atrium 031
Lorenz, Sarah	Student	9:00 a.m., 1:00 p.m.	Kirkhof Center GRR 069
Lozon, Elizabeth	Student	2:00 p.m.	Kirkhof Center 2270

M

Mack, Curtis	Student	9:00am-11:00am, 12:00pm	Henry Hall Atrium 024
Madden, Gwyn	Mentor	9:00 a.m.	Henry Hall Atrium 053
Madden, Gwyn	Mentor	3:30 p.m.	Kirkhof Center 2201
Maguire, Brooke	Student	9:00 a.m.	Henry Hall Atrium 054
Mahmutovic, Aldina	Student	9:00 a.m.	Henry Hall Atrium 037
Makowski, Ericka	Student	11am-1pm, 2pm-4pm	Henry Hall Atrium 058
Malak, Victoria	Student	1:00 p.m.	Henry Hall Atrium 012
Maloney, Shannon	Student	12:00 p.m.-2:00 p.m.	Henry Hall Atrium 107
Mantri, Jidnyasa	Student	9:00 a.m.	Henry Hall Atrium 090
Maouene-Cavin, Josita	Mentor	9:00 a.m.	Henry Hall Atrium 058
Marek, Caitlin	Student	2:00 p.m.	Kirkhof Center 1104
Martinez, Jennifer	Student	2:30 p.m.	Kirkhof Center 2259
Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 023
Mason, Julia	Mentor	9:00 a.m.	Henry Hall Atrium 044
Mason, Julia	Mentor	9:00 a.m.	Henry Hall Atrium 080
Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 121
Mason, Julia	Mentor	9:00 a.m.	Henry Hall Atrium 100
Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 126
Mason, Julia	Mentor	9:00 a.m.	Kirkhof Center 2263
Mason, Julia	Mentor	2:00 p.m.	Kirkhof Center 2263
Matchett, Stephen	Mentor	9:00 a.m.	Henry Hall Atrium 049
Matich, Christian	Student	9am-12pm, 2pm-4pm	Kirkhof Center GRR 070
Mayers, Leifa	Mentor	9:00 a.m.	Henry Hall Atrium 044
Mayers, Leifa	Mentor	9:00 a.m.	Kirkhof Center GRR 121
Mayers, Leifa	Mentor	9:00 a.m.	Henry Hall Atrium 100
Mayers, Leifa	Mentor	9:00 a.m.	Kirkhof Center 2263
McBane, George	Mentor	9:00 a.m.	Henry Hall Atrium 026
McBane, George	Mentor	9:00 a.m.	Kirkhof Center GRR 119
McCabe, Michael	Student	3:00 p.m.	Henry Hall Atrium 030
McCraney, Cassandra	Student	4:00 p.m.	Henry Hall Atrium 078
McHugh, Meghan	Student	9:00 a.m.	Kirkhof Center GRR 093
McKee, Maria	Student	10:30 a.m.	Kirkhof Center 2266
McLellan, Sarah	Student	4:00 p.m.	Kirkhof Center GRR 036
McLellan, Sarah	Student	12:00 p.m.	Kirkhof Center 2201
McWhinnie, Jason	Student	9:00 a.m.	Henry Hall Atrium 077
Medici, Marissa	Student	10:00 a.m.	Kirkhof Center GRR 092
Medina, Alyssa	Student	4:00 p.m.	Library Exhibition Space 06

Meindertsma, Camelia	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center GRR 020
Melton, Antewnet	Student	3:00 p.m.	Kirkhof Center GRR 055
Melville, Stacey	Student	4:00 p.m.	Henry Hall Atrium 078
Micallef, Kara	Student	1:00 p.m.	Kirkhof Center 2215/2216
Mihelic, Alicia	Student	1:00 p.m.	Henry Hall Atrium 013
Milano, Samantha	Student	1:00 p.m.	Henry Hall Atrium 093
Miling, Lauren	Student	9:00 a.m., 12:00 p.m.	Kirkhof Center GRR 082
Miller, Alexander	Student	2:30 p.m.	Kirkhof Center 2201
Miller, Christian	Student	10:00 a.m.	Kirkhof Center 2201
Miller, Laura	Student	12:00 p.m.	Kirkhof Center GRR 011
Miller, Madeline	Student	10:00 a.m.	Kirkhof Center 2270
Miller, Noah	Student	10:00 a.m.	Library Exhibition Space
Millsbaugh, Erica	Mentor	9:00 a.m.	Kirkhof Center GRR 009
Miloser, Payton	Student	12:30 p.m.	Kirkhof Center 2201
Mohamed, Khadija	Student	9:30 a.m.	Kirkhof Center 2266
Monahan, Lauren	Student	10:00 a.m.	Henry Hall Atrium 010
Montalbano, Jessica	Student	1:00 p.m.	Kirkhof Center GRR 006
Moore, Jared	Mentor	12:00 p.m.	Kirkhof Center 2215/2216
Moose, Elizabeth	Student	4:00 p.m.	Kirkhof Center 2270
Moran, Kailee	Student	1:00 p.m.	Kirkhof Center 1142
Moran, Katherine	Mentor	9:00 a.m.	Kirkhof Center GRR 111
Moran, Nicholas	Student	11:00 a.m.	Kirkhof Center 2263
Moret, Zulema	Mentor	9:00 a.m.	Kirkhof Center 2215/2216
Moret, Zulema	Mentor	10:00 a.m.	Kirkhof Center 2215/2216
Morgan, Wesley	Student	1:00 p.m.	Kirkhof Center 2266
Morris, Braydon	Student	9:00 a.m.	Kirkhof Center GRR 094
Moss, Andrew	Student	1:00 p.m.	Kirkhof Center 2270
Mott, Kara	Student	11:00 a.m.	Kirkhof Center GRR 020
Moy, Amanda	Student	2:00 p.m.	Henry Hall Atrium 112
Mucha, Heidi	Student	9:00 a.m., 11:00 a.m.	Henry Hall Atrium 011
Mulder, Brianna	Student	9:00 a.m., 12:00 p.m.	Kirkhof Center GRR 088
Muller, Leslie	Mentor	1:00 p.m.	Kirkhof Center 2259
Muscaro, Aaron	Student	2:00 p.m.-5:00 p.m.	Henry Hall Atrium 033
Myers, Jared	Student	1:00 p.m.	Henry Hall Atrium 082
N			
Nelson, Sara	Student	9:00 a.m.	Henry Hall Atrium 011
Nelson, Taylor	Student	9:00 a.m., 1:00 p.m.	Kirkhof Center GRR 069
Nguyen, Duy Ngoc Thanh	Student	1:00 p.m.	Kirkhof Center GRR 097

Nguyen, Nguyet	Student	1:00 p.m.	Kirkhof Center GRR 091
Nguyen, Trang	Student	3:00 p.m.	Kirkhof Center 2201
Nichols, Brookelyn	Student	10:00 a.m.	Kirkhof Center GRR 015
Nietling, Rachael	Student	10:00 a.m.	Kirkhof Center 1142
Nihem, Hannah	Student	12:00 p.m.	Kirkhof Center GRR 097
Nikitin, Alexey	Mentor	9:00 a.m.	Henry Hall Atrium 025
Noonan, Zachary	Student	1:00 p.m.	Kirkhof Center 2266
Nordman, Erik	Mentor	9:30 a.m.	Kirkhof Center 2201
Norris, Alexander	Student	11:00 a.m.	Kirkhof Center 2259
Novach, Lindsey	Student	9:30 a.m.	Kirkhof Center 2259
Novotny, Karen	Mentor	9:00 a.m.	Henry Hall Atrium 069

O

O'Neill, Meghan	Student	10:00 a.m.	Kirkhof Center 2266
Ogletree, Tiana	Student	9:00 a.m., 4:00 p.m.	Kirkhof Center GRR 057
Okkonen, Madeline	Student	10:00 a.m.-12:00 p.m.	Henry Hall Atrium 077
Okros, Maxwell	Student	12:00pm, 3:00pm	Henry Hall Atrium 016
Okros, Maxwell	Student	1:00 p.m.	Kirkhof Center 2263
Oliai, Shahryar	Student	9:00 a.m.	Kirkhof Center GRR 025
Olsen, Kegan	Student	3:00 p.m.	Kirkhof Center 2259
Oppman, Rebecca	Student	4:00 p.m.	Library Exhibition Space 02
Ortiz, Elizabeth	Student	10:00 a.m.	Kirkhof Center 2201
Orzechowski, Rachel	Student	1:00 p.m.	Henry Hall Atrium 043
Otieno, Bennett	Mentor	9:00 a.m.	Henry Hall Atrium 093
Owens, Megan	Student	9:00 A.m.	Kirkhof Center GRR 046

P

Pacino, Annaka	Student	4:00 p.m.	Library Exhibition Space 01
Palazzolo, Michael	Student	10:30 a.m.	Kirkhof Center 2270
Pall, Kaitlyn	Student	2:00 p.m.	Kirkhof Center GRR 081
Palm, Conner	Student	11:00 a.m.-2:00 p.m.	Henry Hall Atrium 082
Parker, Lilah	Student	4:00 p.m.	Library Exhibition Space 04
Parker, Lilah	Student	4:00 p.m.	Library Exhibition Space 05
Parker, Stephanie	Student	9:30 a.m.	Kirkhof Center 2259
Parr, Jarred	Student	12:00 p.m.	Kirkhof Center 2215/2216
Parshall, Samantha	Student	10:00 a.m.	Kirkhof Center GRR 088
Parzuchowski, Brent	Student	9:00 a.m.	Henry Hall Atrium 073
Parzynski, Jessica	Student	2:00 p.m.	Henry Hall Atrium 101
Patel, Riya	Student	10:00 a.m.	Henry Hall Atrium 010
Patil, Amrutha	Student	5:00 p.m.	Library Multipurpose Room

Pattison, Jordan	Student	1:00 p.m.	Kirkhof Center GRR 038
Paul, Gage	Student	9:00 a.m.	Henry Hall Atrium 048
Paul, Gage	Student	1:00 p.m.	Kirkhof Center 2263
Peterson, Ginny	Mentor	9:00 a.m.	Kirkhof Center GRR 021
Peyton, Dalton	Student	1:00 p.m.	Kirkhof Center GRR 110
Pham, Uyen	Student	10:00 a.m.	Henry Hall Atrium 064
Phan, Hung	Student	9:30 a.m.	Kirkhof Center 2266
Phillips, Alexander	Student	2:00 p.m.	Kirkhof Center GRR 076
Pickett, Trevor	Student	9:00am, 2:00pm, 4:00pm	Henry Hall Atrium 079
Pieczynski, Emily	Student	12:00 p.m.	Kirkhof Center GRR 118
Pierson, Laura	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center GRR 060
Pitts, Mary	Student	9:00 a.m.	Kirkhof Center GRR 045
Plaska, Sam	Student	9:00 a.m.-12:00 p.m.	Henry Hall Atrium 085
Plichta, Mitchell	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center GRR 059
Plummer, Lilyann	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center GRR 056
Powell, Gwynne	Student	10:00 a.m.	Kirkhof Center GRR 067
Powers, Rachel	Mentor	9:00 a.m.	Henry Hall Atrium 064
Prestigiacomio, Michael	Student	9:00 a.m.	Kirkhof Center GRR 094
Price, Mary	Student	11:00 a.m.	Henry Hall Atrium 071
Price, Sandra	Student	4:00 p.m.	Henry Hall Atrium 096
Prince, Anna	Student	1:00 p.m.-3:00 p.m.	Henry Hall Atrium 051
Prisichenko, Kyryl	Student	9:00 a.m.-11:00 a.m.	Henry Hall Atrium 104
Proctor, Lauren	Student	2:00 p.m.	Henry Hall Atrium 108
Proefke, Nicholas	Student	2:30 p.m.	Kirkhof Center 1104
Q			
Quackenbush, Kirie	Student	12:30 p.m.	Kirkhof Center 2259
R			
Raber, Tessa	Student	12:00 p.m.-2:00 p.m.	Kirkhof Center GRR 112
Ragland, Dashaun	Student	3:00 p.m.	Kirkhof Center GRR 088
Ramsson, Eric	Mentor	9:00 a.m.	Kirkhof Center GRR 129
Randall, Hannah	Student	11:00 a.m.	Kirkhof Center 2215/2216
Range, Megan	Student	12:00 p.m.	Kirkhof Center GRR 088
Ranger, Nicholas	Student	1:00 p.m.	Library Exhibition Space
Rankin, Colleen	Student	9:00am, 12:00pm-4:00pm	Kirkhof Center GRR 080
Rankinen, Wil	Mentor	9:00 a.m.	Henry Hall Atrium 101
Rayor, Diane	Mentor	2:00 p.m.	Library Multipurpose Room
Reasoner, Erin	Student	11:00 a.m.	Kirkhof Center GRR 130
Rebello Lima, Vinicius	Mentor	9:00 a.m.	Henry Hall Atrium 075

Rebello Lima, Vinicius	Mentor	4:00 p.m.	Library Exhibition Space 04
Rebello Lima, Vinicius	Mentor	4:00 p.m.	Library Exhibition Space 05
Rebello Lima, Vinicius	Mentor	4:00 p.m.	Library Exhibition Space 11
Rebello Lima, Vinicius	Mentor	4:00 p.m.	Library Exhibition Space 03
Rebello Lima, Vinicius	Mentor	4:00 p.m.	Library Exhibition Space 02
Reberg, Jorgen	Student	1:00 p.m.	Kirkhof Center GRR 072
Reed, Chris	Mentor	9:00 a.m.	Henry Hall Atrium 030
Reed, Chris	Mentor	9:00 a.m.	Kirkhof Center GRR 039
Reed, Chris	Mentor	9:00 a.m.	Henry Hall Atrium 102
Reed, Chris	Mentor	9:00 a.m.	Henry Hall Atrium 016
Reed, Chris	Mentor	9:00 a.m.	Kirkhof Center GRR 043
Reeves, Alexandria	Student	9:00 a.m.	Henry Hall Atrium 010
Reeves, Amanda	Student	10:00 a.m.	Kirkhof Center 1142
Reffeor, Wendy	Mentor	9:00 a.m.	Henry Hall Atrium 086
Reffeor, Wendy	Mentor	9:00 a.m.	Kirkhof Center GRR 041
Reid, Robert	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center GRR 060
Reis, Carolina	Student	12:00 p.m.	Kirkhof Center GRR 052
Reitsma, Bailey	Student	1:00 p.m.-3:00 p.m.	Kirkhof Center GRR 026
Remlinger, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 055
Remlinger, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 050
Remlinger, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 042
Remlinger, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 037
Remlinger, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 036
Remlinger, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 053
Remlinger, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 105
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 057
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 098
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 040
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 078
Remlinger, Kathryn	Mentor	9:00 a.m.	Henry Hall Atrium 096
Remlinger, Kathryn	Mentor	9:00 a.m.	Kirkhof Center GRR 128
Remski, Lindsey	Student	12:00 p.m.	Kirkhof Center GRR 110
Rentfrow, Hillary	Student	2:00 p.m.	Kirkhof Center GRR 079
Rhodes, Lauren	Student	10:00 a.m.	Kirkhof Center GRR 111
Rich, Callie	Student	1:00 p.m.	Henry Hall Atrium 095
Richardson, Megan	Student	10:30 a.m.	Kirkhof Center 1104
Richiert, Dawn	Mentor	9:00 a.m.	Kirkhof Center GRR 039
Richiert, Dawn	Mentor	9:00 a.m.	Henry Hall Atrium 102

Richiert, Dawn	Mentor	9:00 a.m.	Henry Hall Atrium 016
Richiert, Dawn	Mentor	9:00 a.m.	Kirkhof Center GRR 043
Richter, Cole	Student	4:00 p.m.	Kirkhof Center GRR 058
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 056
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 082
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 077
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 083
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 079
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 083
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 080
Rilett, Rachel	Student	12:00 p.m.	Henry Hall Atrium 077
Roberson, Arielle	Student	1:30 p.m.	Kirkhof Center 2270
Roberts, Austin	Student	12:30 p.m.	Kirkhof Center 2201
Roberts, Chante	Student	10:00 a.m.	Kirkhof Center GRR 117
Roberts, Kim	Mentor	10:00 a.m.	Kirkhof Center 2263
Roberts, Kim	Mentor	10:00 a.m.	Library Exhibition Space
Roberts, Kim	Mentor	11:00 a.m.	Library Exhibition Space
Roberts, Kim	Mentor	11:30 a.m.	Kirkhof Center 2201
Roberts, Kim	Mentor	12:00 p.m.	Kirkhof Center 2266
Roberts, Kim	Mentor	12:00 p.m.	Kirkhof Center 2263
Roberts, Kim	Mentor	12:30 p.m.	Kirkhof Center 2270
Roberts, Kim	Mentor	12:30 p.m.	Kirkhof Center 2259
Roberts, Kim	Mentor	1:00 p.m.	Kirkhof Center 2201
Roberts, Kim	Mentor	1:00 p.m.	Kirkhof Center 2270
Roberts, Kim	Mentor	1:00 p.m.	Kirkhof Center 2215/2216
Roberts, Kim	Mentor	1:00 p.m.	Library Exhibition Space
Roberts, Kim	Mentor	3:00 p.m.	Kirkhof Center 2263
Roberts, Kim	Mentor	4:30 p.m.	Kirkhof Center 2266
Robinson, Chehallis	Student	4:00 p.m.	Library Exhibition Space 14
Robinson, Gerald	Student	9:00 a.m.-2:00 p.m.	Kirkhof Center GRR 031
Robinson, Paige	Student	11:00 a.m.	Henry Hall Atrium 066
Robinson, Santana	Student	1:00 p.m.	Kirkhof Center 2215/2216
Rodgers, Thomas	Student	2:00 p.m.	Henry Hall Atrium 060
Roehm, Cecelia	Student	1:00 p.m.	Henry Hall Atrium 006
Roehm, Cecelia	Student	2:00 p.m.	Henry Hall Atrium 053
Roldan, Michelle	Student	11am-1pm, 3pm-5pm	Henry Hall Atrium 063
Rooney, Kayla	Student	9:00 a.m.-12:00 p.m.	Kirkhof Center GRR 083
Root, Emeline	Student	11:00 a.m.	Kirkhof Center 2270

Ross, Kyrah	Student	4:00 p.m.	Kirkhof Center GRR 053
Rothe, Samantha	Student	9:00 a.m.	Kirkhof Center 1142
Royer, Marisa	Student	9:00 a.m.	Henry Hall Atrium 010
Roys, Collin	Student	11:00 a.m.	Library Exhibition Space
Rozema, Luke	Student	10:00 a.m.-12:00 p.m.	Henry Hall Atrium 038
Ruhala, Jack	Student	12:00 p.m.	Henry Hall Atrium 004
Ruiz, Violet	Student	1:00 p.m.	Kirkhof Center GRR 004
Rush, Tyler	Student	10:00 a.m.	Kirkhof Center GRR 019
Rushton, Evan	Student	4:00 p.m.	Henry Hall Atrium 019

S

Saa, Mylia	Student	12:00 p.m.	Kirkhof Center GRR 098
Sachteleben, Emma	Student	10:00 a.m.-12:00 p.m.	Kirkhof Center GRR 002
Sandborn, Courtney	Student	1:30 p.m.	Kirkhof Center 2270
Sankey, Wanda	Student	9:00 a.m.	Henry Hall Atrium 068
Sass, Georgette	Mentor	9:00 a.m.	Kirkhof Center GRR 034
Scarber, Spencer	Student	11:00 a.m.	Henry Hall Atrium 086
Schaeff, Casey	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center GRR 056
Schaertel, Stephanie	Mentor	9:00 a.m.	Henry Hall Atrium 026
Schaertel, Stephanie	Mentor	9:00 a.m.	Kirkhof Center GRR 119
Schaub, Gayle	Mentor	4:00 p.m.	Library Exhibition Space 10
Schaub, Gayle	Mentor	4:00 p.m.	Library Exhibition Space 03
Scheidel, Tess	Student	12:00 p.m.	Henry Hall Atrium 007
Schepke, Kristin	Student	9:00 a.m.	Kirkhof Center 2266
Schmitz, Melissa	Student	3:00 p.m.	Henry Hall Atrium 057
Schoen, Kailey	Student	12:00 p.m.	Kirkhof Center GRR 007
Scholten, Alisha	Student	9:00 a.m.	Henry Hall Atrium 002
Schroeder, Bill	Mentor	9:00 a.m.	Henry Hall Atrium 076
Schuemann, Eric	Student	1:00 p.m.-3:00 p.m.	Kirkhof Center GRR 021
Schulte, Kayla	Student	9:00 a.m., 1:00 p.m.	Henry Hall Atrium 082
Schultz, Theodore	Student	9:00 a.m.	Henry Hall Atrium 026
Schwan, Kelly	Student	4:00 p.m.	Henry Hall Atrium 001
Schymik, Gregory	Mentor	9:00 a.m.	Henry Hall Atrium 090
Seiler, Kendall	Student	12:00 p.m.	Kirkhof Center 1142
Selasky, Christopher	Student	9:00 a.m.	Kirkhof Center GRR 078
Semaan, Leslie	Student	11:00 a.m.	Kirkhof Center GRR 115
Shagonaby, Cathlynn	Student	9:00 a.m.-12:00 p.m.	Kirkhof Center GRR 083
Sharapata, Melissa	Student	11am-1pm, 2pm-4pm	Henry Hall Atrium 058
Sharpe, Kera	Student	9:00 a.m.-12:00 p.m.	Kirkhof Center GRR 083

Shea, Connor	Student	4:00 p.m.	Library Exhibition Space 17
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 116
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 107
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 117
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 120
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 104
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 118
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 112
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 115
Shier, Anna	Student	3:00 p.m.	Henry Hall Atrium 057
Shier, Anna	Student	2:00 p.m.	Kirkhof Center 2215/2216
Short, Lindsey	Student	9:00 a.m.-2:00 p.m.	Kirkhof Center GRR 031
Sierminski, Ashley	Student	12:00 p.m.	Kirkhof Center GRR 099
Sink, Warren	Student	4:00 p.m.	Kirkhof Center GRR 088
Sisson, Lisa	Mentor	9:00 a.m.	Kirkhof Center GRR 099
Sisson, Lisa	Mentor	9:00 a.m.	Kirkhof Center GRR 094
Sisson, Lisa	Mentor	9:00 a.m.	Kirkhof Center GRR 092
Sisson, Lisa	Mentor	9:00 a.m.	Kirkhof Center GRR 093
Sisson, Lisa	Mentor	9:00 a.m.	Kirkhof Center GRR 097
Sisson, Lisa	Mentor	9:00 a.m.	Kirkhof Center GRR 095
Sisson, Lisa	Mentor	9:00 a.m.	Kirkhof Center GRR 100
Sisson, Lisa	Mentor	9:00 a.m.	Kirkhof Center GRR 101
Sisson, Lisa	Mentor	9:00 a.m.	Kirkhof Center GRR 098
Siwik, Shea	Student	1:00 p.m.	Henry Hall Atrium 052
Skinner, Brenna	Student	10:30 a.m.	Kirkhof Center 2201
Slager, Dianne	Mentor	9:00 a.m.	Kirkhof Center GRR 032
Slais, Taylor	Student	9:00 a.m.	Library Multipurpose Room
Slim, Yousif	Student	12:00 p.m.-3:00 p.m.	Kirkhof Center GRR 066
Smallwood, Amarri	Student	3:30 p.m.	Kirkhof Center 2259
Smelt, Julia	Student	10:30 a.m.	Kirkhof Center 2270
Sobolak, David	Student	3:00 p.m.	Kirkhof Center 2263
Spagnuolo, Ashley	Student	9:00 a.m.	Kirkhof Center GRR 088
Sparks, Benjamin	Student	2:30 p.m.	Kirkhof Center 2266
Spring, Robin	Mentor	1:00 p.m.	Kirkhof Center 2266
Squires, Breezy	Student	9:00 a.m.	Henry Hall Atrium 054
St John, Rachel	Student	9:00 a.m.	Henry Hall Atrium 018
Stachowski, Taylor	Student	3:00 p.m.	Kirkhof Center GRR 128
Stankov, Marisa	Student	10:00 a.m.	Henry Hall Atrium 041

Stark, David	Mentor	9:00 a.m.	Kirkhof Center GRR 072
Stark, David	Mentor	9:00 a.m.	Kirkhof Center 2201
Stark, David	Mentor	9:00 a.m.	Library Multipurpose Room
Stark, David	Mentor	2:00 p.m.	Kirkhof Center 2215/2216
Starr, Jade	Student	3:00 p.m.	Kirkhof Center GRR 017
Staves, Mark	Mentor	3:00 p.m.	Kirkhof Center 2266
Stawinski, Michael	Student	1:30 p.m.	Kirkhof Center 2266
Steinman, Alan	Mentor	9:00 a.m.	Henry Hall Atrium 043
Stevens, Benjamin	Student	3:00 p.m.	Kirkhof Center 2263
Stevenson, Mallory	Student	4:00 p.m.	Henry Hall Atrium 040
Stewart, James	Student	4:00 p.m.	Kirkhof Center 2215/2216
Strickler, Timothy	Mentor	9:00 a.m.	Henry Hall Atrium 033
Strickler, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 039
Strickler, Timothy	Mentor	9:00 a.m.	Henry Hall Atrium 102
Strickler, Timothy	Mentor	9:00 a.m.	Henry Hall Atrium 016
Strickler, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 043
Stroik, Laura	Mentor	9:00 a.m.	Henry Hall Atrium 070
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 039
Stroik, Laura	Mentor	9:00 a.m.	Henry Hall Atrium 102
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 123
Stroik, Laura	Mentor	9:00 a.m.	Henry Hall Atrium 016
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 040
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 043
Strouse, Susan	Mentor	9:00 a.m.	Henry Hall Atrium 037
Stuart, Nathan	Student	12:00 p.m.	Kirkhof Center GRR 011
Stuart, Zachary	Student	1:00 p.m.-3:00 p.m.	Henry Hall Atrium 065
Sturgeon, Evan	Student	3:00 p.m.	Henry Hall Atrium 098
Sullivan, Lauren	Student	12:00 p.m., 4:00 p.m.	Kirkhof Center GRR 048
Sullivan, Nicholas	Student	10:00 a.m.	Library Exhibition Space
Sun, Ruoxuan	Student	2:00 p.m.	Henry Hall Atrium 062
Sund, Emily	Student	2:00 p.m.	Kirkhof Center GRR 122
Swanson, Janice	Student	12:00 p.m.	Henry Hall Atrium 004
Swets, Benjamin	Mentor	3:00 p.m.	Kirkhof Center 2215/2216
Swifink, Skylar	Student	10:00 a.m.	Henry Hall Atrium 002
Sylvester, Francis	Mentor	9:00 a.m.	Kirkhof Center GRR 035
Sylvester, Francis	Mentor	9:00 a.m.	Kirkhof Center GRR 070
Sylvester, Francis	Mentor	9:00 a.m.	Henry Hall Atrium 081
Sylvester, Francis	Mentor	9:00 a.m.	Henry Hall Atrium 008

Szarecka, Agnieszka	Mentor	9:00 a.m.	Henry Hall Atrium 084
Szarecka, Agnieszka	Mentor	9:00 a.m.	Henry Hall Atrium 092
Szczepaniak, Eric John	Student	2:00 p.m.	Kirkhof Center 2215/2216

T

Tawney, Douglas	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center GRR 060
Taylor, Brittany	Student	9:00 a.m.	Kirkhof Center GRR 032
Taylor, Daryn	Student	9:00am, 2:00pm, 4:00pm	Henry Hall Atrium 079
Teegardin, Brittany	Student	11:00 a.m.	Kirkhof Center GRR 098
Tekiela, Kelly	Student	11:00 a.m.-1:00 p.m.	Henry Hall Atrium 085
Teunis, Katrina	Student	10:00 a.m.	Henry Hall Atrium 045
Thimm, Aidan	Student	9:00 a.m.	Kirkhof Center GRR 077
Thomas, Derek	Mentor	9:00 a.m.	Kirkhof Center GRR 052
Thomassen, Claire	Student	9:00 AM, 12:00 PM	Kirkhof Center GRR 080
Thompson, Cynthia	Mentor	9:00 a.m.	Henry Hall Atrium 071
Thompson, Isabel	Student	1:00 p.m.	Kirkhof Center GRR 114
Thompson, Joshua	Student	3:00 p.m.	Kirkhof Center 2270
Thompson, Joshua	Student	3:00 p.m.	Kirkhof Center 2215/2216
Thomson, Osta	Student	11:30 a.m.	Kirkhof Center 1142
Thorgaard, Scott	Mentor	9:00 a.m.	Kirkhof Center GRR 003
Timmer, Christopher	Student	4:00 p.m.	Kirkhof Center GRR 058
Timmer, Megan	Student	11:00 a.m.	Kirkhof Center GRR 014
Tokarski, Casimir	Student	9:00 a.m.	Kirkhof Center GRR 025
Tomaszewski, Will	Student	11:00 a.m.	Kirkhof Center GRR 101
Towse, Theodore	Mentor	9:00 a.m.	Kirkhof Center GRR 022
Trainor, Collin	Student	1:00 p.m.	Kirkhof Center GRR 106
Tran, Javis	Student	3:00 p.m.	Kirkhof Center GRR 119
Tuccini, Michael	Student	4:00 p.m.	Library Exhibition Space 18
Tuma, Lorie	Mentor	9:00 a.m.	Henry Hall Atrium 028
Tusch, Guenter	Mentor	9:00 a.m.	Kirkhof Center GRR 025
Tusch, Guenter	Mentor	9:00 a.m.	Henry Hall Atrium 090
Tusch, Guenter	Mentor	9:00 a.m.	Henry Hall Atrium 068

U

Urban, Nicholas	Student	11:00 a.m.-1:00 p.m.	Henry Hall Atrium 015
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V

Vaitkevicius, Carly	Student	3:00 p.m.	Henry Hall Atrium 098
Vaitkevicius, Eric	Student	12:00 p.m.	Henry Hall Atrium 097
Valdez, Glenn	Mentor	9:00 a.m.	Kirkhof Center GRR 090

Vallery, Richard	Mentor	9:00 a.m.	Henry Hall Atrium 055
Van Laanen, Aryn	Student	4:00 p.m.	Kirkhof Center 2259
Van Neuren, Sydney	Student	9:00 a.m.	Henry Hall Atrium 002
Van Wyngarden, Cheri	Student	10:00 a.m.	Kirkhof Center GRR 073
VanDenBerg, Haydn	Student	12:00 p.m.	Henry Hall Atrium 003
VanHalm, Kaylee	Student	3:00 p.m.	Kirkhof Center GRR 030
VanHorn, Courtney	Student	4:00 p.m.	Kirkhof Center GRR 037
VanHorn, Courtney	Student	3:00 p.m.	Kirkhof Center GRR 105
VanNuil, Emily	Student	9:00 a.m.	Kirkhof Center 1142
VanOosten, Brandon	Student	12:00 p.m.	Kirkhof Center GRR 007
VanSlooten, Joseph	Student	9:00 a.m.-1:00 p.m.	Henry Hall Atrium 085
VandenPlas, Jessica	Mentor	9:00 a.m.	Kirkhof Center GRR 082
VanderKooi, Marie	Mentor	9:00 a.m.	Kirkhof Center GRR 073
VanderKooi, Marie	Mentor	9:00 a.m.	Henry Hall Atrium 068
VanderKooi, Marie	Mentor	9:00 a.m.	Henry Hall Atrium 109
VanderMolen, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 063
VanderMolen, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 096
Vargo, Lindsay	Student	12:00 p.m.	Henry Hall Atrium 074
Varnado, Jared	Student	12:00 p.m.-2:00 p.m.	Kirkhof Center GRR 112
Varner, Adam	Student	10:00 a.m.	Library Exhibition Space
Veazey, Joshua	Mentor	9:00 a.m.	Henry Hall Atrium 111
Veldboom, Jordan	Student	12:00 p.m.	Kirkhof Center GRR 034
Vercellino, Sandra	Student	9:00 a.m.	Henry Hall Atrium 018
Veres, Brooke	Student	10:00 a.m.	Kirkhof Center 1104
Vermeer, Hannah	Student	9:00 a.m.	Henry Hall Atrium 102
Vermeer, Hannah	Student	10:00 a.m.	Kirkhof Center GRR 040
Vitale, Francesca	Student	3:00 p.m.	Kirkhof Center GRR 128
Vollmers, Christian	Student	12:00 p.m.	Kirkhof Center GRR 041
Vozza, Sophia	Student	2:00 p.m.	Kirkhof Center GRR 125

W

Wagner, Nathaniel	Student	9:00 a.m., 11:00 a.m.	Kirkhof Center GRR 104
Walker, Afton	Student	3:00 p.m.	Kirkhof Center GRR 105
Walker, Joshua	Student	9:00 a.m.-12:00 p.m.	Kirkhof Center GRR 083
Walker, Thomas	Mentor	11:00 a.m.	Kirkhof Center 2201
Walker, Thomas	Mentor	12:00 p.m.	Kirkhof Center 2259
Walker, Thomas	Mentor	12:30 p.m.	Kirkhof Center 2266
Walker, Thomas	Mentor	2:00 p.m.	Kirkhof Center 2266
Walker, Thomas	Mentor	2:00 p.m.	Kirkhof Center 2259

Wallar, Bradley	Mentor	9:00 a.m.	Kirkhof Center GRR 124
Walter, Caiden	Student	11:00 a.m.	Kirkhof Center GRR 029
Walter, Louis	Student	9:00 a.m.	Kirkhof Center GRR 018
Walters, Alexander	Student	12:30 p.m.	Kirkhof Center 2270
Ward, Anya	Student	9:00 a.m.	Henry Hall Atrium 035
Ward, Jacob	Student	3:30 p.m.	Kirkhof Center 2270
Warner, Alexander	Student	1:00 p.m.	Kirkhof Center 2266
Warner, Anthony	Student	11:00 a.m.	Kirkhof Center GRR 006
Warrner, Sierra	Student	11:30 a.m.	Kirkhof Center 1104
Watson, Taylor	Student	11:00 a.m.	Kirkhof Center GRR 099
Wechsler, Rachel	Student	1:00 p.m.	Kirkhof Center GRR 127
Weekley, Ayana	Mentor	3:30 p.m.	Kirkhof Center 2259
Wegener, Madison	Student	10:30 a.m.	Kirkhof Center 1142
Weglarz, Daniel	Student	11:30 a.m.	Kirkhof Center 2270
Weiland, Macie	Student	9:00 a.m.	Kirkhof Center GRR 085
Wethy, Alexis	Student	4:00 p.m.	Library Exhibition Space 16
Wethy, Alexis	Student	4:00 p.m.	Library Exhibition Space
White, Alaina	Student	9:00 a.m.-12:00 p.m.	Henry Hall Atrium 039
White-Tebo, Drew	Student	12:00 p.m.	Kirkhof Center GRR 100
Wichman, Maia	Student	10:00 a.m.	Kirkhof Center 2201
Wickey, Jane	Student	3:00 p.m.	Kirkhof Center GRR 050
Widmyer, Breanna	Student	4:00 p.m.	Library Exhibition Space
Wierenga, Alaina	Student	3:00 p.m.	Henry Hall Atrium 057
Wilfong, Brynn	Student	5:00 p.m.	Library Multipurpose Room
Wilkerson, Spencer	Student	9:00 a.m.-11:00 a.m.	Henry Hall Atrium 008
Willey, Austin	Student	9:00 a.m.-11:00 a.m.	Henry Hall Atrium 104
Williams, Andrew	Student	9:00 a.m.	Henry Hall Atrium 013
Williams, Kathryn	Student	1:00 p.m.	Kirkhof Center GRR 096
Williams, Kathryn	Student	11:00 a.m.	Kirkhof Center 1142
Williams, Rachael	Student	9:00 a.m.	Kirkhof Center GRR 024
Williams, Todd	Mentor	3:00 p.m.	Kirkhof Center 2215/2216
Williams, Todd	Mentor	4:00 p.m.	Kirkhof Center 2215/2216
Wilson, Alexandra	Student	12:00 p.m.	Kirkhof Center GRR 100
Wilson, Kasey	Student	10:00 a.m.	Kirkhof Center GRR 047
Wilson, Molly	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center GRR 065
Winchester, Randy	Mentor	9:00 a.m.	Kirkhof Center GRR 061
Winterburn, Nathan	Student	12:00 p.m.-2:00 p.m.	Kirkhof Center GRR 112
Winterburn, Nathan	Student	2:00 p.m.	Kirkhof Center GRR 127

Winther, Jennifer	Mentor	9:00 a.m.	Kirkhof Center GRR 045
Winther, Jennifer	Mentor	9:00 a.m.	Kirkhof Center GRR 067
Wirt, Samantha	Student	2:30 p.m.	Kirkhof Center 1142
Wise, Haley	Student	12:00 p.m.	Kirkhof Center GRR 095
Witsaman, Amanda	Student	10:00 a.m.	Kirkhof Center GRR 092
Witsaman, Olivia	Student	9:00 a.m.	Kirkhof Center GRR 093
Witucki, Laurie	Mentor	9:00 a.m.	Henry Hall Atrium 088
Witucki, Laurie	Mentor	9:00 a.m.	Henry Hall Atrium 076
Wolffe, Gregory	Mentor	12:00 p.m.	Kirkhof Center 2215/2216
Wols, Kayla	Student	9:00 a.m.-11:00 a.m.	Kirkhof Center GRR 020
Wood, Maureen	Student	12:00 p.m.	Kirkhof Center GRR 009
Wraight, Henry	Student	12:00 p.m.	Kirkhof Center 2270
Wright, Austin	Student	2:00 p.m.	Kirkhof Center 2266
Wright, Ethan	Student	1:00 p.m.	Henry Hall Atrium 105
Wright, Nicholas	Student	12:00 p.m.	Kirkhof Center GRR 099
Wroblewski, Michael	Mentor	11:00 a.m.	Kirkhof Center 2259
Wrona, Lucas	Student	3:00 p.m.	Kirkhof Center 1104
Wyn, Jessica	Student	1:00 p.m.	Kirkhof Center GRR 129

X

Y

Yakimovich, Nicole	Student	9:00 a.m.	Kirkhof Center GRR 061
Yats, Katherine	Student	2:00 p.m.	Henry Hall Atrium 069
Yau, Taylor	Student	1:30 p.m.	Kirkhof Center 1142
Youker, Brandon	Mentor	9:00 a.m.	Henry Hall Atrium 021
Youker, Brandon	Mentor	9:00 a.m.	Henry Hall Atrium 073
Young, Cian-Kyler	Student	11:00 a.m.	Kirkhof Center 2270
Young, Tarah	Student	10:00 a.m.	Kirkhof Center GRR 015
Yurko, Lucille	Student	9:00 a.m.	Kirkhof Center GRR 016

Z

Zanders, Steven	Student	12:00 p.m.-2:00 p.m.	Kirkhof Center GRR 006
Zettle-Sterling, Renee	Mentor	4:00 p.m.	Library Exhibition Space
Zettle-Sterling, Renee	Mentor	4:00 p.m.	Library Exhibition Space
Zettle-Sterling, Renee	Mentor	4:00 p.m.	Library Exhibition Space 13
Zettle-Sterling, Renee	Mentor	4:00 p.m.	Library Exhibition Space 14
Zielinski, Madison	Student	4:00 p.m.	Kirkhof Center GRR 058
Zielinski, Payton	Student	11:00 a.m.	Kirkhof Center GRR 088
Zivi, Karen	Mentor	9:00 a.m.	Henry Hall Atrium 039

Zivi, Karen
Zolynsky, Nicole
Zysk, Abigail

Mentor 1:30 p.m.
Student 4:00 p.m.
Student 1:00 p.m.

Kirkhof Center 2201
Library Exhibition Space 03
Henry Hall Atrium 093

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

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