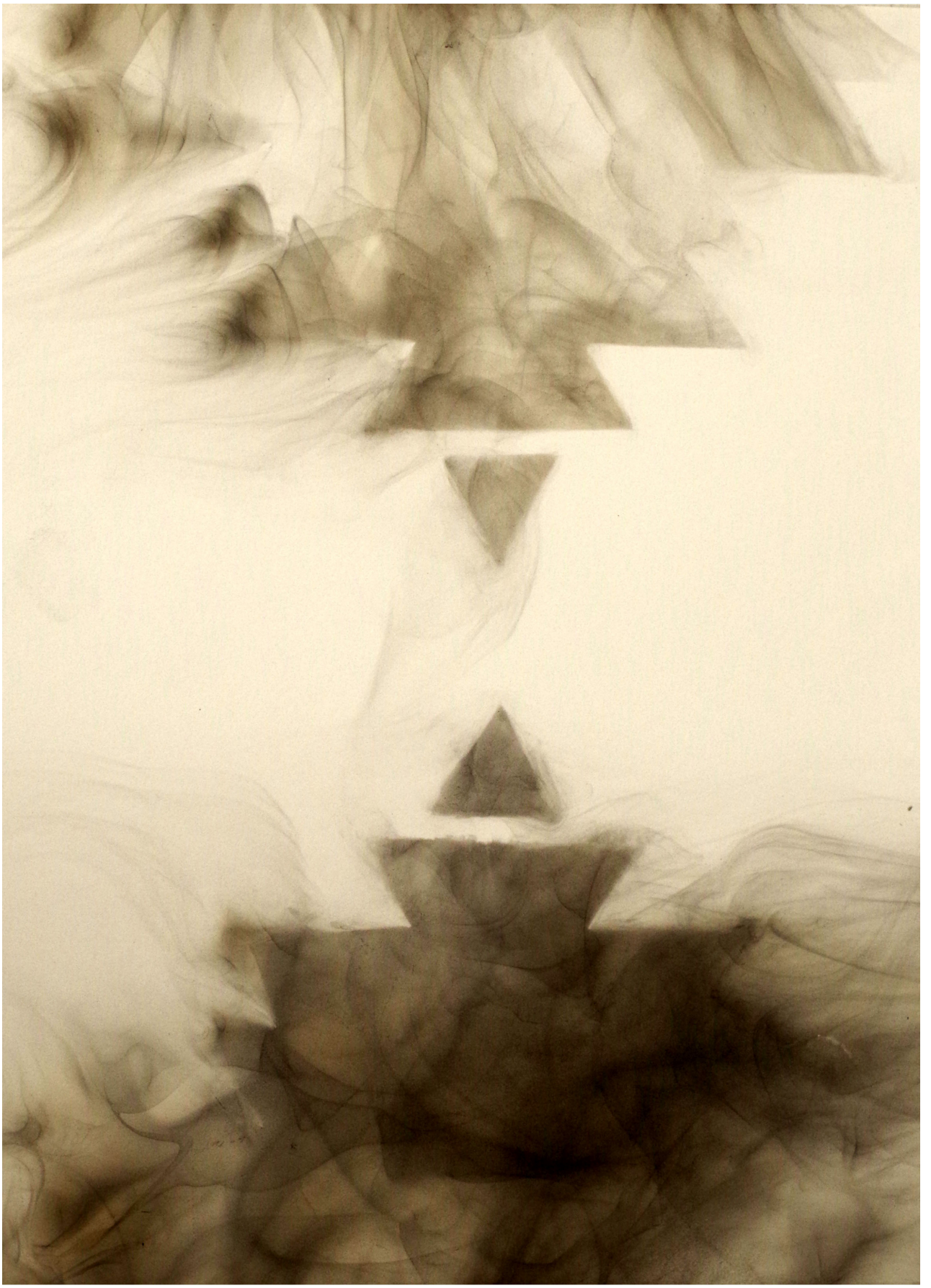
STUDENT SCHOLARS DAY



Amber Anderson, *Containment*

APRIL 13, 2016

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SSD Committee

Feryal Alayont	Mathematics
Jakia Fuller	Office of Undergraduate Research and Scholarship
Matthew Hart	Chemistry
Andrew Lantz	Chemistry
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
Richard Vallery	Physics
Patricia Videtich	Geology

Welcome to Student Scholars Day 2016!

It is with great pleasure that we welcome you to celebrate the diversity and excellence of faculty-student collaboration at GVSU. In its 20th 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, Jakia Fuller, Natalia Blanco, Brianna Stelly, and Ruby Dockery who made this process manageable and enjoyable. We thank the members of the 2016 SSD committee, Feryal Alayont, Matthew Hart, Andrew Lantz, Melissa Morison, Debbie Morrow, Michael Scantlebury, Richard Vallery, and Patricia Videtich, for their dedication and continuous flow of creative ideas. It takes an entire year to put together a program like this, and we appreciate the hours spent engaging with us in this process.

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

Thank you to Amber Anderson for her artistic contributions to this abstract book. “Containment” was one of several pieces submitted in response to a student competition hosted by the Office of Undergraduate Research and Scholarship. Amber’s piece was selected to serve as the cover by the SSD committee.

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

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

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

Please enjoy this day of celebration. Attend the many presentations available throughout the day. We extend a special invitation to attend the presentation given by this year’s Keynote speaker, Dr. David Wineland from the National Institute of Standards and Technology. Today is sure to be a day of sharing and celebration.

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

Schedule of Events

Poster Presentations
Henry Hall Atrium and Kirkhof Center
9:00 a.m. – 5:00 p.m.
See page 14 for detailed schedule.

Oral Presentations
Kirkhof Center
9:00 a.m. – 5:00 p.m.
See page 141 for detailed schedule.

Exhibition of Art
Mary Idema Pew Library Exhibition Space
9:00 a.m. – 6:30 p.m.
Artist Reception 5:30 p.m.
See page 178 for detailed schedule.

Panel Presentations
Mary Idema Pew Library Multi-Purpose Room
2:00 p.m.
See page 177 for detailed schedule.

Film & Live Performance
Mary Idema Pew Library Multi-Purpose Room
9:00 a.m.; 12:00 p.m.
See page 185 for detailed schedule.

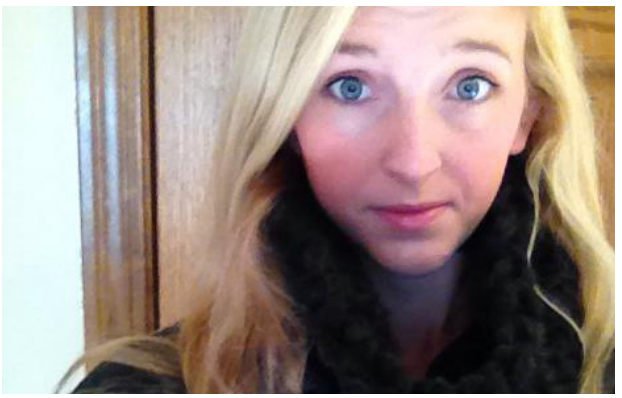
Keynote Lecture
Kirkhof Center, 2204 Pere Marquette Room
6:30 p.m. Hors D'oeuvre
7:00 p.m. Lecture

Statement from the Cover Artist

Amber Anderson

Containment

This is a part of the collection of smoke works titled "Containment". In this series my goal was to create geometrical shapes by capturing the smoke on the paper. The underlying concept behind this work came from two separate ideas. The first, being the never-ending need for humans to want to control the things around them. Through creating new plant species or hybrids to fit our needs or as simple as weeding a garden to keep all the unwanted plants out we are exercising and pushing our control. The second idea came from the destruction of our ozone layer through the burning of different materials. What I learned by doing this was what different materials burn and create different colored smokes because of what is being released. I find the struggle for power and our carelessness so intriguing that I decided to capture it in a way that looked absurd and beautiful all at the same time.



Keynote Lecture

Kirkhof Center, 2250 Grand River Room
7:00 p.m.

Quantum computers and Schrödinger's cat

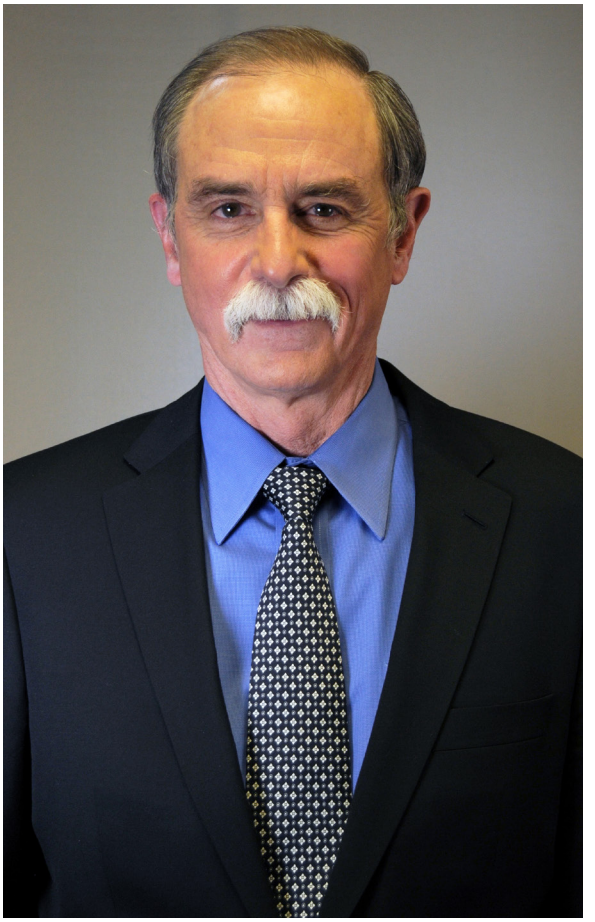
As the size of computer logic gates and memory elements approaches the atomic scale, we are forced to deal with the constraints imposed by the laws of quantum mechanics. However, we now also know that a computer based on quantum mechanics could solve certain problems that are intractable on conventional computers. Interestingly, if this device could be made on a large scale it would have the same characteristics as Erwin Schrödinger's famous 1935 hypothetical cat that could be both dead and alive at the same time. I will briefly relate how our group at NIST became involved in these topics through our experiments on atomic ions, but these experiments only serve as examples of similar work being performed in many other laboratories around the world.

Dr. David Wineland

Since receiving the Nobel Prize, I've often been asked for advice to give to young students. Of course there's no one answer that fits all, but for me, because of my upbringing, it's been pretty simple. I would suggest finding something interesting (even if you change your mind) and give it your best possible effort. That means hard work, and although not everybody above you will appreciate it, most of them will recognize it and support you. And, as nice as it is to be recognized for accomplishments, I think the biggest reward for me has been just to have the opportunity to explore new ideas. The physics has never been a job; it's more like a hobby - and just the process of doing research is extremely interesting and rewarding.

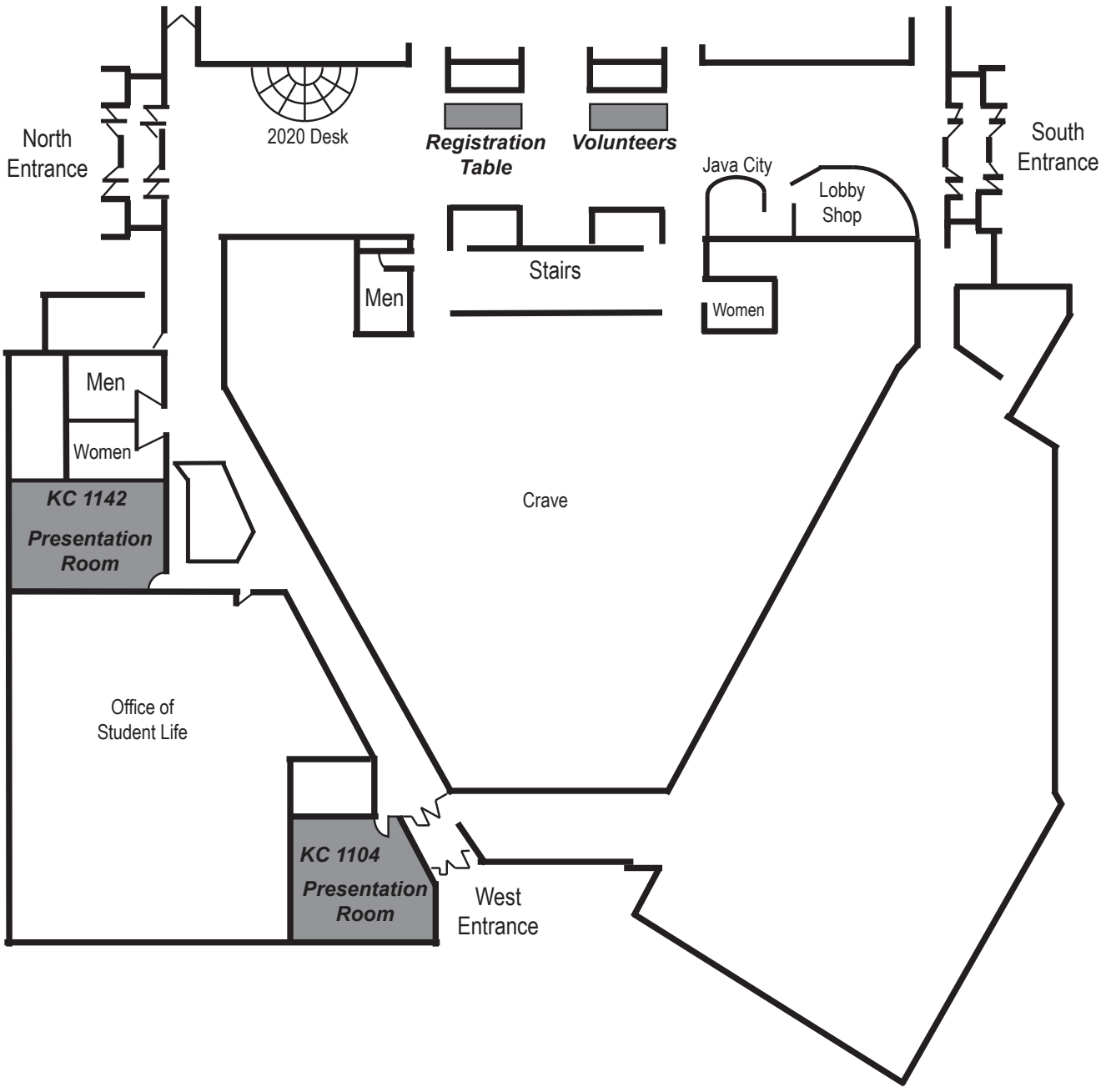
"David J. Wineland - Biographical". Nobelprize.org. Nobel Media AB 2014. Web. 18 Mar 2016.

<http://www.nobelprize.org/nobel_prizes/physics/laureates/2012/wineland-bio.html>

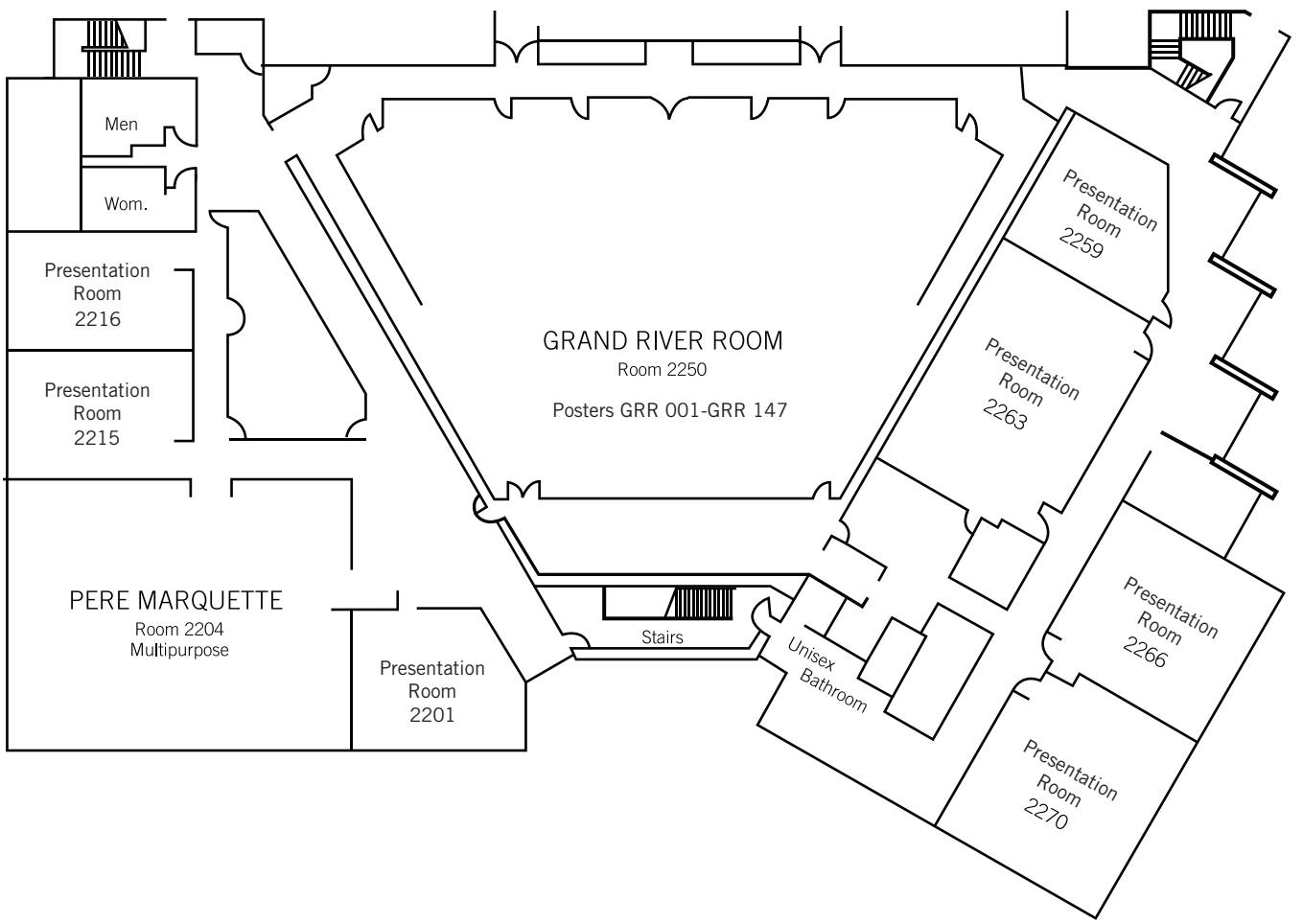


Dr. David Wineland
National Institute of Standards and Technology
(NIST), Boulder, Colorado

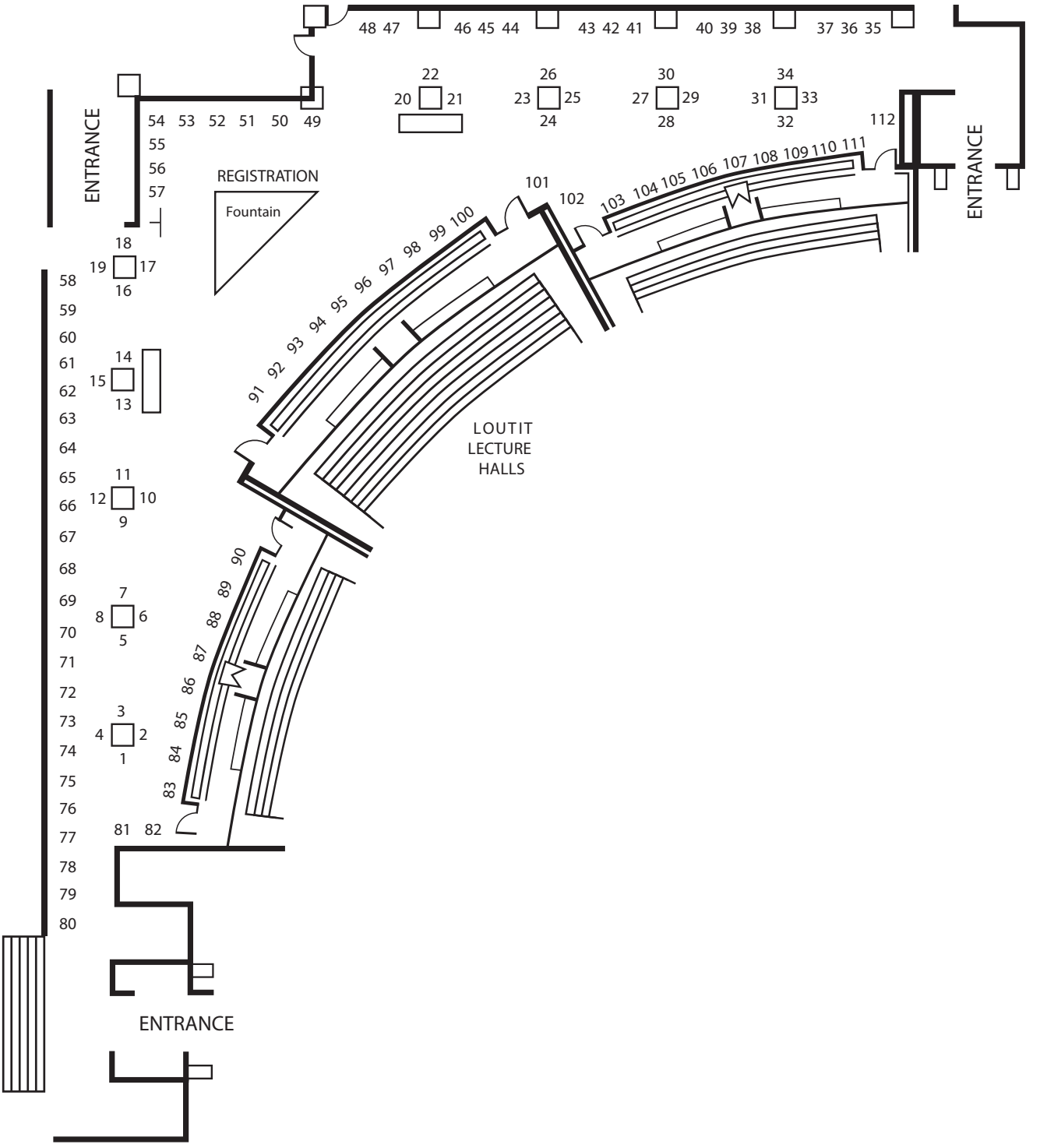
Kirkhof Center First Floor Map



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.

History of Undergraduate Research and Scholarship at GVSU

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

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

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

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

Student Summer Scholars (S3)

S3 provides a $6,000 grant for an undergraduate and faculty mentor to devote 14 weeks to a research and/or creative project during the spring/summer semester. Generally, S3 grants provide a student stipend, faculty stipend, and a small budget for supplies. The S3 program offers a unique opportunity for undergraduate students to conduct research and creative practice in their chosen field. The combination of immersion in the discipline, active scholarship, and deep reflection provides students with a meaningful learning experience that helps to prepare them for graduate school and future careers.

Academic Conference Fund (ACF)

This fund is available to all undergraduate students to present, exhibit, or perform at an academic conference. Student presenters are able to apply for travel grants that range up to $500 for domestic travel and $750 for international travel. The grants encourage student presentations, performances, and exhibits by helping offset the cost of attendance.

Academic and Professional Enrichment Fund (APEF)

The APEF is a faculty-driven travel grant that provides travel funds to support undergraduate student travel to academic conferences and meetings. Attending a conference with a faculty member can be a valuable experience that can enrich a student's understanding of a discipline. APEF is available to all undergraduate students. Full-time faculty can apply for travel grants that range up to $400 per student for travel. Grants do not exceed $1,200.

OURS Project Supplies Grant

The OURS project supplies grant program is designed to encourage collaborative scholarly research and creative work between undergraduate students for faculty members. Students may propose a research, scholarly, or creative project to a faculty member, or a faculty member may actively recruit students for collaboration. OURS grants provide students with financial support that ranges up to $500. Undergraduate students (both part- and full-time) are eligible to apply.

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 2015 McNair Scholars, many of whom are presenting at this year's SSD, include:

Crisol Beliz, Lauren Berry, Kelsie Colley, Parryss Carter-McGee, Dionna Cheatham, Darian Farrell, Marie Griffith, Amaya Guthrie, Sarah Hayes, Sultan Hubbard, Marina Ibarra, Taylor Lewis, C'arra Miller, Bikash Mishra, Aron Rottier, Stacie Stuut, Chela Wallin, and Brandon Wright.

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

Student Summer Scholars

The Student Summer Scholars Program (S3) provides funds for a student and faculty mentor to devote fourteen weeks to a research and/or creative project during the spring/summer semester. Through these grants and the mentorship of a faculty member, the S3 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 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 board for their students.

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

The 2015 Student Summer Scholars presenting at this year's SSD include:

Alexis Awdziejczyk, Matthew Biener, Charles Bradfield, Hunter Brunges, Jordan Cloud, Lindsay Czap, Emily David, Macy Doster, Gabriel Ellis, Bailey Groendyke, Jennifer Grousd, Nicholas Huisingh, Talon Kosak, Alex McBride, Nathaniel Orndorf, Luke Pardy, Brianna Powell, Kristi Ruvina, Victoria Sanders, Emma Schroder, Nikolaus Schroeder, Lindsey Schroedter, Carly Wiersma, and Ryan Zahran.

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

Highlights of GVSU Student Work

Although Student Scholars Day serves as the university's celebration of student scholarship and research, there are a number of department and college events that showcase student research and creative activity. Below is a sampling of such events on campus. If you would like to have your departmental activity listed in future abstract books, please contact ours@gvsu.edu.

Art and Design Department

BFA in Studio Art Senior Project Exhibition Schedule - Winter 2016:

<u>On Campus Exhibits: Allendale Campus</u>

Padnos Student Gallery
April 4-7
Reception Thursday, April 7, 5-7 pm
- Eleanore Lubbers (Illustration)
- Amelia Machelski (Illustration)
- Katherine McAllister (Illustration)

Padnos Student Gallery
April 11-14
Reception Thursday, April 14, 5-7 pm
- Kayleigh Gauthier (Painting)
- Hallie Hofman (Visual Studies)
- Anna Petlick (Metals)

Padnos Student Gallery
April 18-21
Reception Thursday, April 21, 5-7 pm
- Jacob Knoth (Illustration)
- Chelsey Sall (Ceramics)
- Deaven Worley-Watt (Illustration)

Performing Arts Center Gallery
April 11-14
Reception April 14, 5-7 pm
- Caroline Elsner (Illustration)
- Emma DuFort (Illustration)
- Brianne McBryde (Illustration)
- Nick Baldwin (Illustration)
- Lynn Hunsanger (Illustration)

Library Gallery
April 18-21
Reception Thursday, April 21, 5-7 pm
- Sean Hamilton (Illustration)

<u>Off Campus Exhibits: Grand Rapids</u>

Craft House, 40 S. Division
April 10-16
Reception Friday, April 15, 6-9 pm
- Rikki Paepke (Illustration)
- Kellyn Sanders (Illustration)

Richard App Gallery, 910 Cherry St. SE, Grand Rapids, MI 49506
April 22
Reception Friday 6-8:30 pm
- Borgeson, Elizabeth (Graphic Design)
- Ciliak, Nicholas (Graphic Design)
- Cooney, Michelle (Graphic Design)
- Farah, Shannon (Graphic Design)
- Freeland, Zachary (Graphic Design)
- Gordon, Brendan (Graphic Design)
- Howell, Tracey (Graphic Design)
- Mckenzie, Allison (Graphic Design)
- Oteto, Mariam (Graphic Design)
- Peterson, Emily (Graphic Design)
- Riffle, Erik (Graphic Design)
- Snoeyink, Erika (Graphic Design)
- Toth, Nicholas (Graphic Design)

Spring 2016

fishladder

A Student Journal of Art and Writing

Please Join Us!

Art Exhibit: Lake Ontario Hall, Red Wall Art Exhibit

Unveiling: Lake Ontario Hall room 174
Friday, April 15 at 6:00pm-8:00pm

Refreshments Provided!

Contributers:

Nathan Bartos
Rachel Britton
Jacqueline Bull
Danielle Clark
Amber Downs
Cole Eichelberger
Kristen Guilbert
Michelle Kuznicki
Jessica Magnan
Robert Manquen
Sydney McCann
Connor McDonald
Annabelle Miller
Emily Neier
Seth Nelson
Olivia Olds
Matthew Oudbier
Michael Rensi
Ashlyn Rowell
Erica Ruffner
Daulton Selke
Ben Spencer
Samantha Stebbins
Tawny Wagner
Erin Williams
Christi Wiltenburg

Poster Presentations, Abstracts & Schedule

HENRY HALL ATRIUM 001

Strabismus and Consanguinity

Participants attending 11:00 AM - 12:00 PM, 3:00 PM - 4:00 PM
Presenters: Abigail Cousino, Matthew Sinclair
Mentor: Noor Ghiasvand

Current data indicates that strabismus-eye misalignment-is inherited as a multifactorial trait, showing familial clustering. However, there is published data indicating that this disorder is influenced by consanguinity-marriage to a blood relative. Thus indirectly indicating the involvement of a significant number of autosomal recessive single genes in the development of this trait. To confirm or reject this possibility, in 2010 we initiated a study to evaluate the association between consanguinity and strabismus. To this end, we measured the coefficient of inbreeding in two populations: 373 strabismus patients and 153 controls. The coefficient of inbreeding for the patients' and the control group were 0.0163 and 0.0132, respectively (p=0.331). Based on this finding, it appears that there is not a large number of autosomal recessive alleles that in a homozygous state would cause strabismus, which confirms multifactorial mode of inheritance for this trait.

HENRY HALL ATRIUM 002

Satisfaction with MiCAPABLE: Community Aging in Place in a Home and Community Based Medicaid Waiver Program in Michigan

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenter: Nora Gilliam
Mentor: Sandra Spoelstra

Older adults of low-socioeconomic status are increasingly disabled; with the elderly population growing exponentially in the U.S, MiCAPABLE improves the health and well-being of low-income elderly adults while helping them age-in-place in their homes. Satisfaction surveys were collected upon completion of the 12-week intervention. Quantitative data and qualitative open-ended questions were collected. To date, 32 surveys were analyzed using SPSS. 97% of the 32 participants stated that the program helped them stay in their homes. 97% would recommend the program to others. 69% reported being very satisfied with staff interactions, 12% reported being somewhat satisfied, and 19% reported interactions were just right. 97% of all participants were also satisfied with the handouts given to them. Only 1 person reported not likely the program. Overall, 97% of participants felt just right or satisfied with the MiCAPABLE intervention, staff, and handouts.

HENRY HALL ATRIUM 003

Porous Asphalt Cost-Benefit Analysis for Church Parking Lot in North Grand Rapids

Participants attending 9:00 AM - 10:00 AM
Presenter: Stephen Graeser
Mentor: Paul Sicilian

A cost-benefit analysis is performed for a local church in the Greater Grand Rapids (Michigan) area on installing a portion of porous asphalt in their parking lot to reduce the amount of pollutants entering the environment, to slow down the flow of water after a rain storm to contain water on the property, to reduce land erosion, and to help educate the local community on sustainable practices. Contingent valuation is utilized to estimate dollar-value costs and benefits of said project. Recommendations are made to the church based on the findings, and takeaways are made for general decision-making regarding whether to include porous pavement for future parking lot projects for the West Michigan area.

HENRY HALL ATRIUM 004

Genesis of Ball-and-Pillow Deformation Structures in the Ordovician Fairview Formation

Participants attending 10:00 AM - 11:00 AM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenters: Matthew Collins, Brooke Haines, Jatamia McCray, Brooke Portwood
Mentor: Peter Riemersma

The upper Fairview Formation of Maysville, Kentucky displays sedimentary structures indicative of seismic activity during the Middle to Late Ordovician. The ball-and-pillow structures, found primarily in siltstone and limestone, are thought to be related to liquefaction and density instability. These structures appear as slumping “pillow-shaped” lobes of clastic or carbonate sedimentary rocks caused by soft-sediment deformation during or soon after deposition. Based on seismic liquefaction in geologically recent deposits, larger earthquakes during early Appalachian uplift events may have resulted in structures like those in the Fairview Formation. Tide-induced and load-induced liquefaction have been proposed as alternative methods of formation. Through analysis of deformed and un-deformed hand samples and thin sections, as well as comparative literature review, we will reconstruct the sedimentation processes at work during the formation of these deformed beds.

HENRY HALL ATRIUM 005

Biological Testing of Novel Telomerase Inhibitor Mesenteric Arteries

Participants attending 12:00 PM - 1:00 PM
Presenters: Basma Khudhur, Bikash Mishra, Pavithra Ramanathan, Katie Uhl
Mentor: Suganthi Sridhar

As of 2011, cancer was the leading cause of death in the United States. Cancer is often referred to as “immortal”, because of its ability to divide a seemingly infinite amount of times. Normal cells are limited in the number of times they can divide by the caps on the ends of their chromosomes, called telomeres. Two series of compounds were synthesized with the goal of creating novel telomerase inhibitors. The first series was derived from the structure of BIBR 1532, and the second series was based on an ester linkage. The efficacy of these compounds were compared against that of BIBR 1532 at similar concentrations, in order to determine if these novel compounds would prove to be adequate cancer treatments. The compounds were tested against metastatic cancer cells at varying concentrations, and then a Telomerase Repeat Amplification Protocol assay was performed. The results show that all of the compounds show anti-proliferative qualities, and also demonstrate telomerase inhibition.

HENRY HALL ATRIUM 006

The Effect of Dimethylamylamine, a Nutritional Supplement, on Vascular Reactivity

Participants attending 9:00 AM - 10:00 AM
Presenters: David Fucinari, Corbin Gilchrist, Samuel Nystrom
Mentor: Francis Sylvester

1,3-Dimethylamylamine (DMAA), a drug thought to mimic the effects of amphetamine, is used in many dietary and pre-workout supplements. Though DMAA use has become increasingly popular, the vasoactive effects of this compound on the circulatory system have yet to be researched. Few published studies have observed statistically significant physiological effects of DMAA in humans, although these studies only tested changes in vital measurements of heart rate and blood pressure. This experiment focused on the direct effects of DMAA on arteries. In this study, rings of porcine renal, pulmonary, and coronary arteries were excised, attached to a force transducer to measure contractile force, and exposed to varying concentrations of DMAA. It is expected that these results will help us better understand the effects of DMAA on the human circulatory system.

HENRY HALL ATRIUM 007

Effect of Low-Intensity Exercise on Postprandial Response Following a 12-Hour Fast

Participants attending 3:00 PM - 4:00 PM
Presenter: Jessica Wheeler
Mentor: Ross Sherman

Background: Research shows increased risk of CVD in individuals with elevated postprandial (post-meal) lipemia. Improved fat oxidation is present after moderate intensity exercise. Aim: To study the effect of low-intensity exercise 12 h prior to ingestion of a high fat meal on postprandial lipemia and glycemia. Methods: Eight college-aged students participated, which followed a randomized, crossover design. Participants completed 45 min of 3.5 mph, 7% incline treadmill walking or passive rest followed by a 12 h fast. The next morning a pre-meal finger-stick blood sample was taken and then a high fat meal was ingested followed by further blood samples, 1, 2, and 3 h post-meal. Results: Blood glucose showed a significant ($p<0.05$) decrease at pre-meal and 3 h post meal compared to 1 h post-meal, and exercise trended ($p=0.06$) towards decreasing total cholesterol. Conclusion: Low intensity exercise 12 h prior to a high fat meal did not alter postprandial lipemia or glycemia responses.

HENRY HALL ATRIUM 008

Effects of Caffeine Ingestion on Repeated Sprint Performance

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Michael Harmon, Isaiah Marion, Addison Walstra
Mentor: Ross Sherman

Background: The effect of caffeine ingestion on repeated sprint performance is to be determined. It has been investigated that caffeine will have an effect on performance, particularly distance over time. Purpose: The purpose of this study was to determine the effect of an acute ingestion of caffeine on repeat sprint performance. Methods: Eight college-aged individuals participated in this randomized, crossover, single blind study. Participants were physcially active and were not habitual caffeine consumers (defined as greater than 1 cup of coffee per day). Participants refrained from any form of caffeine for 24 prior to testing. Participants consumed either 5 mg/kg^{-1} body mass caffeine or maltodextrin (control) dissolved in a flavored sports drink. At least 1 h later, participants completed five 40-yd sprints with 30 s rest between each sprint. At least 3 days and no longer than 7 days later, participants returned and performed the second trial. Results: Data will be presented at SSD.

HENRY HALL ATRIUM 009

The Effect of Beta-methylphenethylamine on Porcine Renal and Coronary Arteries

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

Presenters: Bailey Bischer, Janet Chung, Kyle Fish, Philipp Osiptsov, Anton Petrenko

Mentor: Francis Sylvester

CONTEXT: Beta-methylphenethylamine (BMPEA; 1 amino 2-phenylpropane) is a substance commonly found in pre-workout and weightloss supplements. BMPEA may be an adrenergic agonist and is a positional isomer of amphetamine. Data on the vasoactivity of BMPEA are, however, limited. AIM: Our aim is to determine the vasoactive effects of BMPEA in coronary and renal arteries. SETTINGS AND DESIGN: Sets of porcine coronary and renal arteries were extracted, sectioned and mounted onto force transducers fixed in organ baths. Arterial sections were treated with increasing concentrations of potassium chloride, phenylephrine, and/or sodium nitroprusside at concentrations of 10^{-7} to 10^{-4} M to test arterial contractions or relaxations. Arterial sections were then treated with increasing concentrations of BMPEA ranging from 10^{-7} to 10^{-4} M. These studies are ongoing.

HENRY HALL ATRIUM 010

Energetics Among Collegiate Ice Hockey Players

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

Presenter: Karyn Schmaltz

Mentor: Cara Ocobock

The purpose of this experiment is to determine the energy expenditure of collegiate ice hockey players during an average period of a game and how energetics change throughout a game. The difference in energy expenditure between males and females as well as forwards and defensemen was studied. Collegiate ice hockey players, 10 men and 10 women (ages 18-22) were tested. The average body mass of male forwards was 84.7 ± 5.1 kg, male defense 86.4 ± 8 kg, female forwards 68.1 ± 9.7 kg, and female defense 65.1 ± 8.2 kg. The players wore heart rate monitors and accelerometers for the duration of a 60-minute league game, their shift length was recorded, and body composition was measured. The total energy expenditure for each game was calculated, with male forwards expending 1222.7 ± 127.7 kcal, male defense 1243 ± 206.9 kcal, female forwards 765 ± 126.5 kcal, and female defense 803.6 ± 60.8 kcal. Findings from this study will help with game preparation through hydration and nutrition.

HENRY HALL ATRIUM 011

Errors Affecting Patient Safety

Participants attending 4:00 PM - 5:00 PM
Presenter: Dawn Lydick
Mentor: Julia VanderMolen

Medication error is a chief cause of harm for hospitalized patients that leads to further illness or death. The Institute of Healthcare Improvement reported that about 15 million instances of medical error occur each year (Chenot & Daniel, 2010). Drug label terminology, evaluation of nursing curricula, and advancements in technology are areas of concern in a healthcare setting that can reduce medication error outcomes. Beneficial routines for optimal patient safety include enhancing patient hand off techniques, reducing medication administration errors, and evaluating nonsurgical and surgical patients. The use of direct observation, medical safety tools, enhanced education, and standardized methods result in improved patient safety and quality of care. A systematic review of literature retrieved from PubMed, ProQuest Medical Library, and and Medline (ISI) yielded 15 peer reviewed articles pertaining to the effects of medication error regarding patient safety in legal adults.

HENRY HALL ATRIUM 012

Breastfeeding Education in Winneba, Ghana: The Creation of a Three Brochure Series

Participants attending 3:00 PM - 4:00 PM
Presenter: Sarah Thornton
Mentor: Kelli Damstra

This project started as an assessment of what topics health care providers in Winneba, Ghana covered in their prenatal breastfeeding education. What I found was that the health care workers, specifically at the Coast for Christ Baptist Hospital, did not provide written information for their patients. With the support of the staff at that hospital, I set out to create a series of educational brochures for them to distribute to their patients. This presentation will outline the process I went through to create this three brochure series, including contacting translators and illustrators, performing evidence-based research, and brainstorming printing and delivery methods to create these educational pieces.

HENRY HALL ATRIUM 013

Comparison of Load Carrying Capacity of Three and Four Lobed Polygonal Shaft and Hub Connection for Constant Grinding Diameter

Participants attending 9:00 AM - 10:00 AM
Presenter: Ravi Bhatta
Mentor: Wendy Reffeor

The conformal contact between the shaft and the hub in polygonal profiles makes it difficult to design them analytically. With the advancement of numerical analysis as Finite Element Analysis, these issues can be addressed, making polygonal shafts a viable competitor to keyed and splined shafts. This research explores the loading strength of the standardized three and four lobe polygonal shafts and hubs manufactured from the same stock size, subjected to torsional bending load from a spur gear of 20° pressure angle at various fits using Finite Element Method. From the analysis, it was found that the hub experienced greater stress than the shaft in all cases. The clearance fit was found to be the most critical connection and interference fit to be the most suitable for larger power transmission. Owing to its small normal axial stress and hub displacement, the P4C clearance fit has its use in low power transmission where sliding fit is a requirement.

HENRY HALL ATRIUM 014

Motivational Fit and Taste Perceptions

Participants attending 9:00 AM - 10:00 AM
Presenter: Lauren Berry
Mentor: Ernest Park

Regulatory focus refers to the two types of motivational orientations that people can take on, promotion and prevention orientations, respectively. Regulatory fit can be described as the event in which an individual's motivational orientation matches with how a goal is framed. Experiencing regulatory fit makes us "feel right" and this feeling may transfer to other judgments we make such as how much something is worth or how much we enjoy the taste of health foods. Our research will add the component of taste perceptions to the regulatory fit research and hopefully provide some insight into how we can frame messages to make health foods taste better.

HENRY HALL ATRIUM 015

Math & Stats Center Trends

Participants attending 10:00 AM - 11:00 AM
Presenters: Brittany Galvin, Darren Kapustka
Mentors: Marcia Frobish, John Gabrosek

We are working with Marcia Frobish, professor of Mathematics, who heads the Math & Stats Center on GVSU's Allendale and Pew Campuses. Our goal is to find general trends in the data that Marcia has collected through student sign-ins over the past four years. The data are composed of the following information: sign in time and date, class, and reason for visit. Marcia is looking to see how to better schedule her staff for shifts to accommodate the Centers' needs. We will separate our analysis by Pew location and the Allendale location.

HENRY HALL ATRIUM 016

Social Exclusion and its Effects on Physical Vulnerability

Participants attending 3:00 PM - 4:00 PM
Presenter: Darian Farrell
Mentor: Kristy Dean

Social exclusion has both social and physical consequences (Baumeister & Leary, 1995). A growing body of literature argues for the fundamental nature of belonging as well as the interconnections between belonging and physical security needs (e.g. Eisenberger 2012; DeWall et al., 2010). The current study included experimental manipulations (via a visualization task) of social exclusion and acceptance and utilized different measures of one's motivation to obtain physical security. We expected that social exclusion would motivate behavior aimed at achieving physical safety or preventing physical vulnerability. The results demonstrated few differences in the valuation of objects that provide physical safety as a function of condition, and those that emerged were contrary to hypothesis. Also contrary to hypotheses, excluded (vs. accepted) participants made more physically risky decisions. Discussion focuses on alternative explanations for these findings.

HENRY HALL ATRIUM 017

Land Cover Change in the Wasatch Valley: The Effect of Development in Utah's Wasatch Valley on the Surface Area of the Great Salt Lake

Participants attending 9:00 AM - 10:00 AM
Presenter: Andrea Hendrick
Mentor: Wanxiao Sun

The purpose of this research is to determine if there is a direct correlation between development of the Wasatch Valley and the loss of surface water in the Great Salt Lake. Development of the American West is occurring rapidly. Water shortages cannot be ignored. Las Vegas has seen significant urban sprawl that has strained the natural resources. This has been the trend in the suburban areas surrounding Salt Lake City. Herriman, Utah has seen a 31% increase in population

from 2010 to 2014. This research used census data to graph the population change in the Wasatch Valley. Landsat images from 1985 to 2015 in ten year intervals were classified based on spectral characteristics. Unsupervised classification method was used. The main land coverage types are barrel land, water, snow cover, urban, agriculture, salt flats, mineral extraction and wetland. Lastly, an inverse relationship between urban land cover and Great Salt Lake surface water was determined.

HENRY HALL ATRIUM 018

Implications of Climate Change on Water Use and California Tree Nut Production

Participants attending 4:00 PM - 5:00 PM
Presenter: Skyla Snarski
Mentor: Elena Lioubimtseva

One of the most obvious signs of climate change are changes to the hydrological cycle. An extreme example of the impacts of water shortage is California. California grows virtually all tree nuts in the nation, making the potential for negative water shortage impacts in nut production especially high. This study seeks to understand the complexities of the climate change and drought impacts on nut production by examining leading research and predictive climate models using MAGICC SCENGEN software. Production levels are deviating from previous years, but it will be argued that improving water use strategies can help alleviate changes. Management systems need to adapt to changing climatic regimes. Our research will identify the trajectory of climate systems and provide strategies for adaptation in agricultural production.

HENRY HALL ATRIUM 019

Investigating Student Use of Blended Processing With Kinematics and Momentum Problems

Participants attending 3:00 PM - 4:00 PM
Presenter: Brennan Kulfan
Mentor: Bradley Ambrose

Many physics problem-solving methods emphasize use of conceptual reasoning to set up equations and to check the final solution. This leaves out the strategic approach of blending mathematical formalisms with conceptual reasoning during mathematical manipulation. In 2013 Kuo et al. argued that this behavior, which they call blended processing, is an important part of expert problem solving. Our guiding question of research was, “Is a solid understanding of mathematical and physical concepts surrounding a problem sufficient for students to be able to apply the method of blended processing when possible?” Data were collected by conducting

interviews with students enrolled in PHY 220 and 221 at GVSU, during which we asked students to think aloud while solving problems. Analysis of the data focused on looking for patterns to try to discern what may prevent or enable students to show the behavior of blended processing.

HENRY HALL ATRIUM 020

3-D Gait Analysis With and Without an Oorthopedic Walking Boot

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Kerstyn Hall, Ashley Luzadre
Mentor: Heather Gulgin

Introduction: The orthopedic walking boot creates a leg length discrepancy (LLD), which has been associated with low back pain. The purpose of the study was to examine the kinematics and kinetics of gait with and without an orthopedic walking boot. Methods: Forty healthy participants (m = 20, f = 20, mean age 20.7 yrs., ht. 171.6 cm, wt. 73.2 kg) volunteered. An eight camera Vicon Motion Capture System and AMTI forceplates were utilized to capture the kinematics and kinetics during walking trials across three conditions (bilateral shoes, L shoe & R boot, L barefoot & R boot). Results: The shorter limb had increased plantar flexion and decreased knee flexion, while the longer limb had an increase in knee internal rotation as well as increased lateral trunk lean toward same side. There were smaller ant./post. forces when wearing the boot. Conclusion: The orthopedic walking boot alters the gait in the same way as those with LLD, thus putting them at risk for development of low back pain.

HENRY HALL ATRIUM 021

The Interaction Between Mood and Defensiveness Toward a Freshman Weight Gain Message

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenters: Maria Geselman, Jessica Wheeler
Mentor: Amanda Dillard

Research shows that people may respond negatively, including showing defensiveness, to health behavior information. Self-affirmation may reduce these tendencies and encourage individuals to be more accepting of this information. In this study, we presented 300 college students with a health message about the dangers of excess weight on overall health. We examined the effects of self-affirmation on acceptance of health information. Building on previous research, we also tested how emotional state (e.g., anger, happiness) moderated a self-affirmation.

HENRY HALL ATRIUM 022

Translation Among Multiple Representations in Chemistry: Examining Student Ability and Response Time

Participants attending 2:00 PM - 3:00 PM
Presenter: Thomas Weiss
Mentor: Jessica VandenPlas

This project examines the correlation between spatial ability and the ability of students to translate between multiple molecular representations in chemistry. The ability to distinguish between different structures of molecules helps chemists at the very basic level of understanding chemistry, and expert chemists frequently use different representations to emphasize important molecular features. In this study, organic chemistry students took a spatial ability test as well as a test in which they had to incorporate knowledge of chemistry structures in order to identify two identical molecules portrayed in different representational modes. The students had to transition between the ball and stick models, Lewis structures, skeletal structures, and molecular model kit photographs. Response times were recorded for each match made, allowing an inference of the relative difficulty of each transition.

HENRY HALL ATRIUM 023

3D Printing of Eugenia Cheng's "Associahedron"

Participants attending 2:00 PM - 3:00 PM
Presenter: Samantha Law
Mentor: Edward Aboufadel

In her new book *How to Bake Pi: An Edible Exploration of the Mathematics Behind Mathematics*, Eugenia Cheng introduces a three-dimensional figure called an "Associahedron," which she derives from category theory related to baking. The associahedron is originally a two dimensional net made up of three squares and six regular, congruent pentagons. It requires folding to be turned into a three-dimensional object. However, Cheng warns that the polygons that make up the net will not quite fit together. The point of this project is to fold and successfully 3D-print the associahedron. We will utilize parametric equations, matrices, and other mathematical tools in order to create two different designs in Mathematica. These designs can then be converted to Stereolithograph files and printed. One design will use a pentagon as a base and the other a square. The malformations in each design support the idea that the polygons don't fold perfectly.

HENRY HALL ATRIUM 024

Global Warming and Oxygen Consumption in Embryonic White-spotted Bamboo Sharks (*Chiloscyllium plagiosum*)

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 1:00 PM - 2:00 PM
Presenter: Charles Bradfield
Mentor: Jodee Hunt

Warming oceans can stress fish embryos past their physiological tolerance. We examined the physiological response of embryonic white-spotted bamboo sharks *Chiloscyllium plagiosum* to warming by measuring their O_2 consumption at 20, 25 and 30 C in closed-chamber and flow-through respirometers. The data collected permitted comparison of O_2 consumption across the range of temperatures experienced in the wild as well as comparison of the efficacy of respirometer designs. O_2 consumption was difficult to measure accurately because the tiny embryos consumed little O_2 at any temperature, but the closed respirometer's smaller volume yielded more consistent data than the flow-through design. At 20 and 25 C, O_2 consumption was similar, but it was greater and more erratic at 30 C. Embryos died within 5 days of prolonged exposure to 30 C. We predict that tropical sharks will experience reproductive failure or shift their population distributions as oceans warm, leaving them at great risk in response to global warming.

HENRY HALL ATRIUM 025

Intervention for Bursley Elementary 4th-6th Graders to Improve Breakfast, Sleep, and Screen Time Behaviors

Participants attending 1:00 PM - 2:00 PM
Presenter: Kacie Breen
Mentor: Deborah Lown

Introduction: Skipping breakfast, inadequate sleep, and excessive screen time in children result in poor school performance and in health effects such as obesity. Breakfast frequency and quality decline as a child ages. Most children do not meet the recommended 11 hours of sleep per night and engage in more screen time than the recommended 2 hours per day.
Objective: This study aims to measure change in frequency and quality of breakfast intake, sleep adequacy, and hours of screen time after exposure to a 30 minute educational program focused on these behaviors. Methods: Bursley Elementary 4th-6th grade students will have their prevalence and quality of breakfast intake, sleep adequacy, and amount of screen time measured before and after an educational program. Results: We expect the majority of the children to frequently skip or consume an unhealthy breakfast, obtain inadequate sleep, and engage in excessive screen time. The educational program will positively impact these behaviors.

HENRY HALL ATRIUM 026

Age-Related Patterns of Sexual Dimorphism in Tree Swallows

Participants attending 2:00 PM - 3:00 PM
Presenter: Nicole Lyon
Mentor: Michael Lombardo

Tree Swallows are common birds that feed on aerial insects and readily accept nest boxes for breeding. I used data collected from swallows that bred during four consecutive breeding seasons in nest boxes between 1992-2015 on the GVSU campus to study age-related patterns of sexual dimorphism. On average, males had longer wings, more deeply forked tails, and more holes chewed in their wing and tail feathers than did females. There were no differences between the sexes in mass and head-bill length. Repeated measures ANOVA revealed that there were no significant differences among years in mass and right tail fork length for individuals of both sexes and in right wing length and in feather holes for individual females. In contrast, there were significant differences among years in right wing length and in feather holes in individual males. These age-related patterns of sexual dimorphism suggest there are different causes of selection on male and female Tree Swallows.

HENRY HALL ATRIUM 027

Biochemical Analysis of Enzymes Responsible for Increased Antibiotic Resistance in *Acinetobacter baumannii*

Participants attending 12:00 PM - 1:00 PM
Presenter: Emma Schroder
Mentor: David Leonard

Class D β-lactamases such as OXA-66 provide resistance to many antibiotics. Variants of OXA-66 in dangerous bacteria such as *A. baumannii* include Pro130Gln (OXA-109), Pro130Leu (OXA-80) and Pro130Ser (OXA-206). These mutations may increase catalytic efficiency against carbapenem antibiotics like doripenem. $bla_{\text{OXA-109}}$ was created from $bla_{\text{OXA-66}}$ by overlap extension PCR. OXA-109 was expressed in *E. coli* and purified by ion-exchange chromatography. Kinetic parameters (K_m and k_{cat}) were measured by UV-Vis spectroscopy. Compared to OXA-66, OXA-109 has a 10-fold decrease in K_m and 4-fold increase in k_{cat} against doripenem; it has a 15-fold decrease in K_m with similar k_{cat} against imipenem. Overall, the Pro130Gln mutation results in an ~15-40-fold increase of catalytic efficiency (k_{cat}/K_m) against carbapenems. The δ methyl group of Ile129 is known to sterically clash with the hydroxyethyl group of carbapenems. A mutation of Pro130 may allow Ile129 to move aside alleviating this steric clash.

HENRY HALL ATRIUM 028

I Read toMAYto, You Read toMAHto, Nobody Reads TOmaTO: Explicitly Marking Stress to Foster Prosodic Awareness in Late Speakers of English

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

Presenters: Joshua Gonzales, Katelin Leahy, Tanveer Mangat
Mentor: Jennifer Gross

Expressive reading requires deciphering the correct pronunciations of the individual words on the page (phonology) as well as rendering the appropriate pattern of undulating stress and pulsating beat across connected text (prosody). Unlike many languages, prosodic stress and rhythm are unmarked in English's orthography, making it difficult for those who learn English as a second language to accurately render the melody of English. We reasoned that readers who struggle to gain fluency may benefit from the novel technique of applying stylistic-induced emphasis (e.g. sty LIStic EMphasis) to different types of poetic rhythms (prosthetic poetry). The goal of this novel approach was to help readers to better 'hear' the underlying stress-alternating rhythms of English. It was predicted that training with prosthetic poetry, compared to control conditions, would improve prosodic awareness among late speakers of English.

HENRY HALL ATRIUM 029

Impact of Standing on Power Output During Sprint Cycling in Females

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

Presenter: Alexis Awdziejczyk
Mentors: Jeffrey Potteiger, Ross Sherman

Traditionally, the Wingate cycling test of anaerobic power has been administered in a seated position. It has been observed that during a sprint or uphill climb, cyclists tend to rise out of the saddle in an attempt to generate more power. The purpose of this study was to determine if standing up results in increased power output. Ten female athletes performed two Wingate tests, one seated for the entire 30s, and the other seated for the first 15s, then standing for the final 15s. Testing conditions were randomized and separated by at least 3 days. Power output was adjusted for flywheel acceleration and recorded every second using integrated software. A significant difference was found between the two conditions at seconds 15 and 16. The data do not support our hypothesis as we expected to see an increase in power after subjects were allowed to stand. The difference in conditions shows that athletes generate less power for the first 2s upon standing when performing the Wingate test.

HENRY HALL ATRIUM 030

Environmental DNA Analysis of Lake Michigan Water for the Detection of Asian Carp

Participants attending 10:00 AM - 11:00 AM
Presenters: Hannah French, Taylor Kraus
Mentor: Alexey Nikitin

Asian carp is an invasive species that is a threat to the Great Lakes ecosystem and economy in Michigan. Early detection of invasive species is the first step in controlling the threat. Environmental deoxyribose nucleic acid (eDNA) analysis is becoming a popular detection method that is faster and easier than live specimen capture. In this study, water from Lake Michigan was collected and DNA isolation was performed. Polymerase chain reaction (PCR) and gel electrophoresis were used to identify any Asian carp DNA within the water samples. All samples proved negative for Asian carp DNA. Further samples should be collected from locations closer to Chicago, where Asian carp are already present. Samples should also be collected from large rivers connected to Lake Michigan, as these would be ideal habitats for these fish. While this study has not found evidence of Asian carp in Lake Michigan, steps could still be taken to ensure that Asian carp will not migrate into the lake.

HENRY HALL ATRIUM 031

Bayside Concert Series: Understanding the Concert Attendee

Participants attending 12:00 PM - 1:00 PM
Presenter: Caylie Peet
Mentor: Patricia Janes

The purpose of this study of the Bay Side Concert Series is to understand concert attendees, their expectations and satisfaction, and to build a customer profile of the eight-day concert series at the National Cherry Festival. Three hundred eighty-five people responded (33% response rate) to an online survey during the summer of 2015. Utilizing the Importance Performance Technique, respondents placed high importance and high performance in the atmosphere, the cost value of the experience, the main act, the entertainment and restroom availability. Attendees placed high importance and low performance on seating layout, restroom cleanliness and, speaker volume and quality. Determining the spending patterns of concert attendees will help strategize for an increase in revenue. The average age of the concert attendee is 49 years old. Bay Side Concert Series should consider main acts that have interest to a younger generation to better reflect the overall National Cherry Festival attendance.

HENRY HALL ATRIUM 032

School Policies Addressing Obesity Prevention Methods in Schools Across America

Participants attending 3:00 PM - 4:00 PM
Presenter: Kelly Koerner
Mentor: Julia VanderMolen

Childhood obesity is a growing epidemic in America. State legislature and school policy makers have begun to create laws and governing principles for public schools to prevent obesity rates. Such guidelines include wellness programs- addressing physical education and nutrition programs, nutritional lunch programs- focusing on giving children healthier meal options, and physical education programs- aiming to increase the amount of calories burned to combat obesity. This systematic review compares the results of wellness, nutrition, and physical education strategies and aims to find the most successful method the decrease childhood obesity rates.

HENRY HALL ATRIUM 033

Spurious Acceleration Noise on the LISA Spacecraft Due to Solar Irradiance

Participants attending 10:00 AM - 11:00 AM
Presenter: Brandon Piotrzkowski
Mentor: Brett Bolen

The Laser Interferometer Space Antenna (LISA) is a configuration of three satellites that will precisely measure the distance between each other in order to detect gravitational waves. Therefore, the stability of LISA satellite configuration will be crucial to its ability to measure gravitational waves, as will understanding the noise introduced from environmental accelerations. Although solar irradiance will be a large source of noise in the desired frequency band, previous research has only considered zeroth order calculations of force by irradiance. To remedy this, we used a geometric and material based approach to calculate the force on the satellites. Running our simulation of LISA based on irradiance data from the VIRGO (Variability of solar IRadiance and Gravity Oscillations) satellite, we examined the Fourier transform of force to find the associated acceleration noise. This research will help isolate the gravitational wave signal when LISA is flown.

HENRY HALL ATRIUM 034

Light-Dependent Modification of LRB Complex Members in *Arabidopsis thaliana*

Participants attending 11:00 AM - 12:00 PM
Presenter: Carly Wiersma
Mentor: Matthew Christians

Upon exposure to red light, Light-Response BTB (LRB) becomes active in the light response pathway of *Arabidopsis thaliana* and targets proteins for degradation via the Ubiquitin-Proteasome System. LRB is an E3 ubiquitin ligase that associates with the scaffold protein Cullin3 (Cul3) to degrade Phytochrome B (phyB) and promote photomorphogenesis of etiolated seedlings. Previous research has failed to elucidate the mechanism of their interaction and whether it changes in response to far-red light. The presence of a Cul-like region near the N-terminal end of LRB suggests that it may mediate its interaction with Cul3. LRB was purified and probed for Cul3 and Nedd8 under various light conditions. An interaction between LRB and Nedd8 was visualized on an immunoblot, but we were unable to co-purify Cul3. An understanding of the interaction between LRB and Cul3 will help us better understand the light response pathway in *Arabidopsis thaliana*.

HENRY HALL ATRIUM 035

Gene Expression Analysis for Early Diagnosis of Cerebral Palsy

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Brooke Armistead, Emma Hahs
Mentor: Sok Kean Khoo

Cerebral palsy (CP) is a term used to describe a group of neurological disorders that appear during early childhood, with patients showing permanent dysfunctions in their motor skills. Studies suggested that CP is not caused by problems in the muscular or nervous systems, but by brain damage during varying periods of fetal development. CP is usually first diagnosed at age 2-4, after patients begin to show signs of developmental disability. There is no cure for CP and treatment such as physiotherapies can improve a child's capabilities. Previously, we have identified three specific gene sets–inflammatory, asphyxia, and thyroidal–which can distinguish CP from healthy children by analyzing RNA gene expression from newborn bloodspots. Here, we will evaluate the expression of S100 calcium binding protein A9 (*S100A9*) and tyrosine hydroxylase (*TH*) genes to enable CP diagnostic just after birth. This may allow interventions such as head cooling therapy on CP patients at an early stage.

HENRY HALL ATRIUM 036

Choice and Activity Satisfaction Among Older Adults Living in Residential Care Facilities

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenters: Amy Bartkus, Lauren Clark
Mentor: Heather Wallace

This project will examine the link between the ability to make choices about which activity to participate in and the person's satisfaction with that activity. We hypothesize that those who are given the opportunity to choose their preferred activity, even when past enjoyment of each option is controlled, will report higher satisfaction with what they did than those who had the activity assigned for them. Three visits will be made to residential care facilities: the first to survey residents on their past enjoyment of various activities. Four activities shown to be similar in this respect will be incorporated in the following visits. During the next visit one activity will be offered to residents followed by a questionnaire evaluating activity satisfaction. During the next visit, three activities will be offered followed by the same questionnaire. The data from these questionnaires will be analyzed to reveal whether there is a link between choice and activity satisfaction.

HENRY HALL ATRIUM 037

Evidence for Long-Term Changes in Brain Structure and Function in Contact Sport Athletes

Participants attending 10:00 AM - 11:00 AM
Presenter: Tyler Madden
Mentor: Eric Ramsson

With the continuation and expansion of athletes in contact sports, there has been a growing concern within the public and scientific community for the potential long term effects of repetitive head trauma. Researchers hypothesize contact sport participation may increase the risk of changes in brain anatomy, functionality, and the prevalence of chronic traumatic encephalopathy (CTE). This research will evaluate the changes in athletes that have been found present beyond the acute recovery period following both a clinically-identified concussion and repetitive subconcussive blows to the head, and evidence for CTE. Current research has indicated some changes in neurological functioning in contact sport athletes, including changes in balance, memory, and mood. CTE has been indicated in athletes with a history of repetitive subconcussive blows. The implications of current research suggest a positive correlation between long-term head impacts and chronic neurological changes.

HENRY HALL ATRIUM 038

Understanding Food Labels

Participants attending 10:00 AM - 11:00 AM
Presenter: Jamie Murawski
Mentor: Steven Nizielski

The NLEA was passed in the 1990s to provide consumers with nutrient information. This act only affected packaged goods, leaving gaps in many other foods. In 2015, the FDA required restaurants to post caloric amounts on menus and other nutritional information must be available upon request. Nutritional facts are now more readily available, but many consumers do not understand the information. The terminology can be confusing and the health statements are poorly regulated. With many leading health problems directly related to obesity, consuming healthier food has an important role in preventing disease. A sample of Grand Valley students took a quiz about nutrition facts to assess knowledge of food labels. The answers were used to find common misunderstandings and create a guide to reading food labels. In addition to the guide, this presentation addresses how the information should relate to the Dietary Guidelines of Americans as well as the proposed changes to improve user comprehension.

HENRY HALL ATRIUM 039

Ectopic Floor Plate Cell Marker Expression in the Midbrain is Induced by Nato3 Overexpression

Participants attending 12:00 PM - 1:00 PM, 3:00 PM - 4:00 PM
Presenter: Daniel Doyle
Mentor: Merritt Taylor

In Parkinson's disease, mesencephalic dopaminergic neurons in the substantia nigra die, and cell replacement therapy to counteract this is being heavily investigated. There is no clear answer as to how Nato3, a basic helix-loop-helix transcription factor expressed in the developing neural tube, affects the generation of dopaminergic neurons in the developing nervous system. Previous studies investigated Nato3's necessity *in vivo*, but failed to address how sufficiently Nato3 might affect neural stem cell fates. We explored the effects of Nato3 overexpression in the developing chick embryo so previous results could be expanded upon. Overexpressing Nato3 resulted in sufficient induction of ectopic expression of the floor plate cell markers Shh and Foxa2 in the developing midbrain. It is evident that Nato3 affects cells in a dopaminergic neuron lineage. Further characterization of these effects could identify possible uses related to dopaminergic neuron development for cell therapy.

HENRY HALL ATRIUM 040

An Exploration into Molding Protocols for Application to Large Fossil Samples

Participants attending 2:00 PM - 3:00 PM
Presenter: Mariah Middel
Mentor: Laura Stroik

This project sought to modify current techniques and protocols for molding fossil specimens for application to large samples. The study sample consisted of six micro-mammal dental specimens. Molding trials were replicated three times for each specimen, and the following variables were modified for each set of replicates: type of molding material (Coltene Affinis, 3M ESPE Imprint 3, Heraeus-Kulzer Flexitime), type of applicator (dispenser tips, brushes), and application of pressure (centrifuged, non-centrifuged). After each trial, each mold was evaluated using a stereomicroscope, and the number and type of "errors" (e.g., air bubbles, missing surfaces), resulting in an inaccurate copy, were tallied. It was found that the Flexitime product, when hand-painted on the specimens, resulted in the fewest errors; however, the extra time needed for this type of application may make it less desirable for large samples.

HENRY HALL ATRIUM 041

Identity on the Westside of Grand Rapids: A History of Westown

Participants attending 2:00 PM - 3:00 PM
Presenter: Kenny Urena-Gonzalez
Mentor: Tara Hefferan

This paper traces the history of what it means to be a "Westsider" in Grand Rapids, Michigan. Westown is a neighborhood with a history and identity distinct from other areas of the city. Drawing on interview and archival data, as well as participant-observation, the paper suggests that Westown identity is rooted in the neighborhood's history of immigration, its working-class character, and the impacts of construction projects in the past that served to physically separate Westown from other parts of the city.

HENRY HALL ATRIUM 042

The Association Between the Development of Alcoholism and Anxiety/ Depression in College Students

Participants attending 2:00 PM - 3:00 PM
Presenters: Brianna Bove, Taylor Kroeze
Mentor: Julia VanderMolen

Desired Topic of Discussion: What is the association between the development of alcoholism and anxiety/depression in college students? Are there campus or local opportunities for prevention and/or intervention educational programs? Our area of interest is depression/anxiety and how it is associated with the development of alcoholism in college students. We hypothesize that the main triggers of depression/anxiety in college students are stress related to school, working while in school, roommate issues, and being away from home for the first time. Therefore, we believe that there is an increased association between the development of the two factors. Once we collect the data, we plan to create a poster and also discuss prevention and intervention educational programs. We hope this will bring awareness to students and supply them with resources if need be.

HENRY HALL ATRIUM 043

Effects of Static and Dynamic Stretching on Sprint Performance in College Students

Participants attending 11:00 AM - 12:00 PM, 1:00 PM - 2:00 PM
Presenters: Sarah Flinsky, Nicole McCarrell
Mentor: Ross Sherman

Background: Previous research has shown that static stretching prior to exercise decreases power output, whereas dynamic stretching allows for improved performance. Purpose: The purpose of this study was to determine the effect of static, dynamic, and no stretching on 50 m sprint performance. Methods: Six healthy college-aged participants volunteered for this study. Participants refrained from consuming caffeine for 4 h and food for 2 h prior to testing and were instructed to get at least 8 h of sleep prior to testing. Participants were randomly assigned to one of the three groups and each testing day was separated by 24 h recovery. Dynamic warmup included six stretches performed twice over 20 m. Static warmup included six stretches held two times each 30 sec in length at participants' tolerance. Each participant ran three trials in each condition, with the fastest time between trials recorded using infra-red light gates. Results: Data will be presented at SSD.

HENRY HALL ATRIUM 044

Rising Sea Levels in Florida and the Gulf Coast: Climate Change and its Impact on Coastal Development and Housing

Participants attending 12:00 PM - 1:00 PM
Presenter: Joe Elsen
Mentor: Elena Lioubimtseva

This project plans to address the future of Florida and Gulf Coast region over the course of the 21st century in terms of sea level rise. Historical data from the IPCC of previous sea level rise, dating back to 1765 is analyzed and included. Factors that impact sea level rise, such as greenhouse gas emissions and their impact on melting ice caps, are monitored and recorded for this project. MAGICC/SCENGEN is used to create multiple projections and scenarios, which vary based on mitigation and policy efforts. With these methods in place, a visual representation of Florida and the Gulf Coast will be produced, with multiple pictures detailing the various outcomes that can play out over the 21st century with sea level rise. Waterfront property and development is analyzed, along with the economic loss experienced. Along with the loss of housing property, the issue of population redistribution will be discussed accordingly based on the scenarios presented.

HENRY HALL ATRIUM 045

Effects of Surface Attachment of Polymer Chains on Material Properties

Participants attending 9:00 AM - 10:00 AM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenter: Nathaniel Orndorf
Mentor: Richard Vallery

Polymers are an important group of materials that are a part of many of our everyday products, as well as a key component in new materials and technologies. By including filler particles of varying materials and sizes during synthesis, a polymer composite is created, and the material properties of the composite are altered from that of the original polymer. Polymer composites are often used in products because they often have economical and physical advantages over other materials. Although commonly used, little work has been done on predicting the effects of strong filler-matrix interactions on the material properties of polymer composites. In this project, the effects of silica in Polydimethylsiloxane (PDMS) on Young's Modulus was studied.

HENRY HALL ATRIUM 046

A Review of Over Wintering in *Phidippus audax*

Participants attending 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: Kyle Anderson, Christopher Galbraith, Nicholas Shaver
Mentor: Michael Henshaw

Phidippus audax, or the Bold Jumping Spider, is native to Western Michigan, though it's found across North America from Canada to Mexico. During the winter months in northern regions, *P. audax* overwinters in silk nests in crevices. They overwinter as juveniles and molt to sexual maturity the following spring. We conducted a preliminary study of overwintering capacity by chilling two groups of 37 spiders, one group at 4°C and the other group at -20°C, for 3 weeks. While 23 out of the 37 spiders survived 4°C, none survived the -20°C treatment. We propose additional experiments to explore overwintering capacity, as well as temperature-dependant performance, in *P. audax* from Michigan as well as from Texas to see how their behavior and mortality rates compare.

HENRY HALL ATRIUM 047

Bridging University Divides, Ensuring Real World Impact: A Visual Guide

Participants attending 10:00 AM - 11:00 AM
Presenters: Jonathan Cook, Laura Sample
Mentor: Danielle Lake

This poster presentation visually explores how real-world projects taken on within university courses are extended outside of traditional academic boundaries (i.e. semester cutoffs, disciplinary divides). As a case study mapping projects from "Design Thinking to Meet Real World Needs," it identifies patterns in project traction. Abstracting from this case, the presentation uncovers factors likely to increase real world project outcomes and enhance the sustainability of student-generated initiatives. The presentation will utilize a variety of methods, including systems mapping, visualization, and stakeholder diagramming in order to analyze emerging themes. Ultimately, this poster will identify successful markers from case study visualization and diagram a framework valuable for future comparative analyses with "best practices" as identified in the literature. The findings can be used to explore possible tools or frameworks for sustaining other student-led collaborative projects.

HENRY HALL ATRIUM 048

Analysis of Donor Giving at SSMS

Participants attending 4:00 PM - 5:00 PM
Presenters: Samuel Kelly, Rose Sweet
Mentors: John Gabrosek, David Vessey

Stepping Stones Montessori School is looking for general trends in fundraising patterns to determine which methods optimize fundraising potential. Dr. Vessey, head of the board of trustees for Stepping Stones, is acting as the contact for STA 319 student consultants for the duration of this project. The data analyzed includes more than 10 years of donation records. Our roles as statistical consultants were to look for patterns in the donations to identify methods to improve fundraising.

HENRY HALL ATRIUM 049

Wayfinding in Cognitively Impaired Populations within Virtual Environments

Participants attending 3:00 PM - 4:00 PM
Presenters: Shana Kelly, Sarah Moll
Mentor: Rebecca Davis

Wayfinding is the ability of an individual to find their way in new and increasingly complex situations. In cognitively impaired populations, such as Alzheimer's and mildly cognitively impaired (MCI) patients, wayfinding becomes greatly impaired. Of particular interest in this study was determining if certain visual cues with bright, contrasting colors and familiarity could help this population find their way in a complex virtual environment. The data was collected using eye-tracking glasses and software to determine how much time was spent fixated on certain cues. The number of fixations for helpful cues versus distracting cues was compared to determine if Alzheimer's and MCI patients are less likely than the general population to be able to differentiate between the right and wrong pathways. A multiple linear regression model was built predicting the proportion of successful wayfinding in the environment with both the distracting and helpful cues over the two days of trials.

HENRY HALL ATRIUM 050

Positron Annihilation Lifetime Spectroscopy of DGEBA Epoxy

Participants attending 12:00 PM - 1:00 PM
Presenter: Eric Benjamin
Mentor: Richard Vallery

Polymers are large molecules with repeating sub-units; they have many uses, from Styrofoam cups

to tires. Polymer nanocomposites (PNC) are polymers with nanoparticles scattered in the polymer matrix. Polymers can be either rigid (glassy) or flexible (rubbery) depending on temperature and the type of polymer. The transformation from rigid to flexible occurs at the glass transition temperature, or Tg, which is a affected by the size of voids that occur in polymers. We increased the void size by introducing nanoparticles. We studied this change by using BULK Positron Annihilation Lifetime Spectroscopy (PALS) on well-known DGEBA/DDS epoxy, and measured how pore volume changed as the sample was heated.

HENRY HALL ATRIUM 051

Mutagenic Studies of a Unique Cysteine Ligase Enzyme

Participants attending 3:00 PM - 4:00 PM
Presenter: Emily David
Mentor: Paul Cook

BshC is the final enzyme in a three step pathway for the synthesis of bacillithiol, a compound that enables resistance to fosfomycin in Gram-positive bacteria. BshC is unique from other enzymes of its kind because of an additional ADP binding site and inactivity when studied in the laboratory. To explore BshC function, several site-directed mutants have been selected within the ADP binding pocket. Fluorescence assays have been utilized on the wild-type BshC and one mutant, Y510Q. We determined that Y510Q does not bind ATP as effectively as wild-type BshC. These fluorescence assays will be utilized on W506L, E384A, and H386A mutants and structural analysis of all the mutants will be initiated. Gaining more understanding of the structure of these mutants and how they bind ATP will give a better understanding of how BshC binds its substrate, which will allow the development of inhibitors to combat fosfomycin resistance.

HENRY HALL ATRIUM 052

Paternal Effect on Drosophila Offspring Revealed by Age

Participants attending 9:00 AM - 10:00 AM
Presenters: Anna Mennenga, Isabelle Pokora
Mentors: John Gabrosek, Georgette Sass

Dr. Georgette Sass, a biology faculty member, and Jon Richards, a Cell & Molecular Biology major, conducted a study to determine if the age of male Drosophila, or common fruit fly, has any effect on the longevity of its offspring. Our role as statistical consultants is to conduct the analysis of the data, generate survival curves for a one day old male, 10 day old male, and 20 day old males, and determine if there was a significant difference between the curves.

HENRY HALL ATRIUM 053

A Statistical Consulting Experience: Evaluating the Track and Field Throwers' Progress

Participants attending 9:00 AM - 10:00 AM
Presenters: Nathan Bernicchi, Jacob Matuz
Mentors: Sean Denard, John Gabrosek

Sean Denard is the men's and women's throwing coach for GVSU track and field. Coach Denard was interested in looking at the performance and progress of his athletes. He will use the findings to help develop better training plans for his athletes in the future. Coach Denard had workout programs and throwing distance data on 18 athletes over a 14 month span. As consultants we went through the data and analyzed trends and looked further into the athletes' performance.

HENRY HALL ATRIUM 054

An Investigation of Increased Western Antarctic Ice Sheet Depletion Rates and Contribution to Sea Level Rise

Participants attending 4:00 PM - 5:00 PM
Presenter: Isaac Entz
Mentor: Patrick Colgan

To understand the relationship between Western Antarctic Ice Sheet (WAIS) depletion rates and sea level rise, I reviewed studies of the mass balance data of the WAIS and global sea level data. The mass balance data regards the WAIS and the Pine Island Glacier (PIG), which are two of the best examples of rapidly depleting ice masses in the world. A direct ramification of melting glacial ice is the rise in global sea levels. Investigation of mass balance data along with sea level data has been used to hypothesize that the complete degeneration of WAIS will cause a 5 to 6 meter rise in sea level. This significant rise in sea level will potentially submerge coastal cities and harm fragile marine ecosystems.

HENRY HALL ATRIUM 055

Sexualization and Representations of Powerful Black Women in Television

Participants attending 1:00 PM - 2:00 PM
Presenters: Jasmine Broadnax, Akua Ekye-Addai
Mentor: Ayana Weekley

We are looking at the way that powerful black female characters are represented in television. In looking at Scandal's Olivia Pope, Being Mary Jane and Empire's Cookie, we want to investigate whether the stereotypes that were put on black female characters in the past that were more

blatant are still present in characters today but in a more undercover way.

HENRY HALL ATRIUM 056

Studying the Effectiveness of Video Reflective Journals

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 1:00 PM - 2:00 PM
Presenters: Brandon George, Kathryn Krikke
Mentors: John Gabrosek, Michael Ricco

Dr. Michael Ricco of the Seidman Management Department created a Video Reflective Journal (VRJ) learning model as a course requirement of his students. This was an assignment that required his students to take a periodic video of themselves sharing reflections they had on content learned in class and connections to putting that learning into practice, career connections, etc. His goal was to enhance learning by using this VRJ, as opposed to a written journal, or not journaling at all. Dr. Ricco then designed pre and post surveys for his students to help gauge the effectiveness of the VRJ. As statistical consultants, our goal is to use the quantitative and qualitative data from the surveys in order to analyze the idea that VRJ is a learning enhancement model.

HENRY HALL ATRIUM 057

Characterization of a Mutation Causing Eye Tissue Loss in the Outer Ommatidia of *Drosophila melanogaster*.

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenter: Zachary Carlson
Mentor: Bruce Ostrow

Genetic crosses are instrumental in determining the mode of inheritance for traits in *Drosophila melanogaster*. An advantage of studying *D. melanogaster* is lines of flies containing marker chromosomes that suppress recombination exist, which allow mutations to be located. The Ostrow lab was given the “55-4; Hdc-jk910” line (Martin Burg) with a mutant phenotype named Sauron (*Sau*) causing two-thirds of the eye tissue to die. Deleterious mutations are usually selected against in a population, but *Sau* persisted for two years. I performed crosses of the *Sau* fly line against other stocks with marker chromosomes to isolate *Sau*. *Sau* is an autosomal dominant mutation located on chromosome 2 that was isolated in a new stock. The mutation segregated away from the transgene in “55-4; Hdc-jk910”, though it may be a mutation of the Hdc locus on chromosome 2R. It is possible this mutation does not reduce reproductive fitness and persists as a result.

HENRY HALL ATRIUM 058

What is Your Success Based on in Chemistry 115?

Participants attending 10:00 AM - 11:00 AM
Presenters: Jane DeCoeur, Alyssa Nardone
Mentors: John Gabrosek, Thomas Pentecost

Dr. Thomas Pentecost, a chemistry faculty member at GVSU, wanted to determine what predictors have the most effect on student performance in Chemistry 115. He took a sample of over 800 students and collected data that contained a variety of scores and ratings, including ACT scores, student satisfaction, indicators of the classroom environment, and many more. Our role as student consultants was to analyze the provided data set to assess the effects of the different predictors on overall student performance in Chemistry 115.

HENRY HALL ATRIUM 059

Exclusion in LGBT Anti-Tobacco and Cessation Organizations

Participants attending 3:00 PM - 4:00 PM
Presenter: Leslie Hicks
Mentor: Ayana Weekley

Research has proven that the prevalence of tobacco use for LGBT individuals is drastically higher compared to heterosexual individuals. Many LGBT anti-tobacco and cessation organizations have been created throughout the United States in order to battle this underlying issue. However, many of these existing organizations have shown signs of exclusion within their action plans. This study plans to analyze multiple action plans from LGBT anti-tobacco and cessation organizations in order to find evidence and patterns of exclusion. This will allow for a better understanding of how action plans should be created to be more inclusive for current organization and organizations in the future.

HENRY HALL ATRIUM 060

An Interactive Visualization Model for Breast Cancer Susceptible Genes Discovered Through Bioinformatics Analyses

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenter: Shahrzad Eslamian
Mentors: Jonathan Leidig, Guenter Tusch

Information visualization may be applied to bioinformatics research tools to assist in understanding the complex (often textual) datasets. The main goal of this work was to design an interactive visualization tools to detail the genes potentially responsible for breast cancer as they are

discovered through bioinformatics analysis. The dataset is derived from the publically shared research as maintained by the bioinformatics research community. The visualization aims to detail the explicit relationships and existing analyses of these target genes and their related micro RNA, considering the distributed nature of this field of research and disaggregation of the underlying datasets.

HENRY HALL ATRIUM 061

Time is Money: An Analysis of Stock Return Data Over Time

Participants attending 1:00 PM - 2:00 PM
Presenters: Abigail Chatfield, Meredith Miller
Mentor: John Gabrosek

Dr. Vijay Gondhalekar from the GVSU Finance Department wanted to look for differences in stock return values based on time. Previous research has shown a difference in stock return values between the odd and even weeks from each time the Federal Open Market Committee (FOMC) meets throughout a calendar year. Rather than the current measure of return, which is 4pm day 1 to 4pm day 2, Dr. Gondhalekar wanted to compare the return values during open market hours (9:30 am-4:00 pm) and closed market hours (4:00 pm- 9:30 am). As statistical consultants, our goal was to analyze the stock return data from over a period of twenty years, and look for trends in regards to the FOMC meetings using regression analysis.

HENRY HALL ATRIUM 062

Analysis of Student and Faculty Feedback for Blackboard: A Statistical Consulting Experience

Participants attending 11:00 AM - 12:00 PM
Presenters: Brandon Shannon, Andrew Stine
Mentors: John Gabrosek, Eric Kunnen

Most all students and faculty of Grand Valley State University use Blackboard on an everyday basis. Eric Kunnen and his team of system analysts from the Information Technology department at GVSU created brief separate surveys for faculty and students to gather feedback on Blackboard and posed the question: what can we do to improve Blackboard? The purpose of this study was to uncover ways to improve the Blackboard experience for both students and faculty, and to improve the understanding of the various tools and functions Blackboard offers by interpreting the feedback from the surveys.

HENRY HALL ATRIUM 063

Antimony, Bismuth, and Phosphorous Based Compounds for Nuclear Waste Remediation

Participants attending 10:00 AM - 11:00 AM
Presenters: Erin Leach, Brandon Wackerle
Mentors: John Bender, Shannon Biros

Production of nuclear waste leads to many problems such as stockpiling and long term storage. The heavy metals composing nuclear fuels that result in nuclear waste are unable to be reused unless purified. Many of these elements are rare, dangerous, and expensive. Current remediation methods involve the synthesis of organic ligands that are able to coordinate and extract specific metals. New ligands containing antimony, bismuth, and phosphorous are being modeled and prepared for this purpose. The computational analysis and synthesis of these ligands will be presented.

HENRY HALL ATRIUM 064

Effects of Various Carbohydrate Supplement Forms on Exercise Performance and Physiological Variables

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenter: Brandon Hughey
Mentor: Amy Gyorkos

Carbohydrate (CHO) supplementation has become widely practiced among endurance athletes to improve their performance. Several CHO supplement forms are now available to consumers. Due to limited research on the form of CHO, the purpose of this experiment is to compare the effects of gel and chew supplements on exercise performance and physiological variables. Subjects will visit the laboratory on 4 different occasions. The first visit will involve a peak exercise test (VO_2max test) and the last three visits will include an 80-minute cycling bout followed by a 10km time trial. During the last three visits, ingestion of 1 of 3 supplements (gel, chews, water) will take place before and during exercise. Throughout the trials, frequent measurements of heart rate, blood pressure, RPE, blood glucose and lactate, and gas exchange variables will be taken. The results will be analyzed by comparison of these variables and 10km performance times between the water (control), gel, and chew trials.

HENRY HALL ATRIUM 065

Minimizing the Cost of Guessing Games

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenter: Lindsay Czap
Mentor: David Clark

A two-player “guessing game” is a game in which the first participant, the “Responder,” picks a number from a certain range. Then, the second participant, the “Questioner,” asks only yes-or-no questions in order to guess the number. We will introduce guessing games in which the Responder is allowed to lie. Guessing games with lies are closely linked to error correcting codes, which are mathematical objects that allow us to detect an error in the information that we receive and correct these errors. We will give basic definitions in coding theory and show how error correcting codes allow us to still guess the correct number even if one lie is involved. We will then introduce cost functions to guessing games. By assigning a “cost” to the games, instead of minimizing the number of questions asked, we must find a way to minimize the total cost of our game. We will discuss optimization methods for minimizing the total cost of a guessing game when a cost function is applied.

HENRY HALL ATRIUM 066

Nato3 is Sufficient to Drive Lmx1b Expression in the Developing Neural Tube

Participants attending 11:00 AM - 12:00 PM
Presenter: Nicholas Huisingh
Mentor: Merritt Taylor

The developing chick embryo has multiple organizing centers which are important for the correct development of the neural tube. Nato3 is a bHLH transcription factor that is endogenously expressed in one of these, the floor plate region. This region also gives rise to dopaminergic neurons which are affected in Parkinson’s disease through the coordinated expression of multiple transcription factors, including Lmx1b. Nato3 has a broad and not fully understood role in the proliferation and differentiation of stem cells in the neural tube. Here, we show that overexpression of Nato3 promotes Lmx1b expression in the neural tube. Nato3 was transfected using in ovo electroporation and monitored using a bicistronic EGFP reporter expression vector and the observed effects were characterized using immunohistochemistry. These data demonstrate that Nato3 can drive Lmx1b expression in the neural tube.

HENRY HALL ATRIUM 067

The Effect of the *Hdc^{P211}* and *Hdc^{P218}* Mutant Alleles on Homotypic Courtship Behavior in *Drosophila melanogaster*

Participants attending 9:00 AM - 10:00 AM
Presenters: Thomas Balzeski, Morgan Crofoot
Mentor: Martin Burg

The goal of this study is to determine whether alterations in courtship behavior are due to the elimination of histamine caused by mutations of the *Hdc* gene, which have been shown to disrupt histamine synthesis in the fruit fly *Drosophila melanogaster*. It had previously been shown that the *Hdc^{JK910}* mutant allele disrupts courtship activity, determined through homotypic (same genotype) courtship assays. Two other mutant *Hdc* alleles, *Hdc^{P211}* and *Hdc^{P218}*, had not been examined in the initial courtship studies conducted previously. In this current study, homotypic courtship behavior of *Hdc* mutant flies was observed, analyzed, and compared to previous results using the *Hdc^{JK910}* mutant allele. Preliminary results suggest that the *Hdc^{P218}* and *Hdc^{P211}* mutations cause similar disruption of homotypic courtship behavior. This result suggests that the courtship alterations observed in *Hdc* mutants are due to the disruption of the *Hdc* gene and the inability of the fly to synthesize histamine.

HENRY HALL ATRIUM 068

E-Cigarettes: The Unsafe Alternative

Participants attending 4:00 PM - 5:00 PM
Presenter: Alexandria Mallison
Mentor: Julia VanderMolen

E-cigarettes are presented as a safe and effective method to help smokers quit traditional cigarettes. However, there is no regulation of what goes into E-cigarettes because they are not regulated by the Food and Drug Administration, which does not approve them as a safe method. Users are still inhaling tobacco products as well as ingredients used in antifreeze, formaldehyde, and other toxic cancer-causing chemicals. E-cigarette secondhand smoke proved to be a danger to society due to these chemicals. Due to this finding prohibiting the use of e-cigarettes in worksites, public places, and including e-cigarettes under smokefree laws is supported by the American Lung Association. High levels of nanoparticles are delivered via e-cigarettes, and trigger inflammation linked to asthma, stroke, heart disease, and diabetes. Physical concerns sparked a nationwide safety alert due to explosions of lithium ion batteries in the cigarettes.

HENRY HALL ATRIUM 069

An Experimental Investigation of The Fresnel Equations in Traditional Dielectrics

Participants attending 10:00 AM - 11:00 AM
Presenter: John Gravelyn
Mentor: Harold Schnyders

The goal of this project is to build an inexpensive, yet precise polarimeter to study the Fresnel Equations at the interface of different media. We will consider the cases relating to reflection. A polarimeter measures the angle at which light is polarized. Our polarimeter will contain a polarizing beam splitting cube, to split the light into two perpendicular polarizations. We will then be able to determine the angle of polarization by measuring the intensities. The device will be tested and calibrated by measuring polarization of light waves reflected off of different types of glass, with varying indices of refraction. The method for finding the indices of refraction depends on the angle of polarization of the reflected light, and using the Fresnel Equations we will be able to calibrate our polarimeter to high precision. The polarimeter will be used in the future and the method for finding the index of refraction could be applied to materials where traditional methods fail.

HENRY HALL ATRIUM 070

Effects of Seven Days of Tart Cherry Juice Ingestion on Delayed Onset Muscle Soreness

Participants attending 4:00 PM - 5:00 PM
Presenters: Robert Albert, Erin Brown, Mackenzie Strom
Mentor: Ross Sherman

Background: Resistance/plyometric exercise causes acute muscle damage resulting in inflammation and pain, known as delayed onset muscle soreness (DOMS). Tart cherries, high in antioxidants and anti-inflammatory properties, may help reduce muscle damage. Purpose: To determine the effects of seven days of tart cherry juice ingestion on post-exercise DOMS. Methods: 20 healthy college-aged individuals participated in this study, which used a randomized crossover design. Participants consumed two daily rations of tart cherry juice or a placebo for seven days. On day one, pain tolerance was measured using a digital force gage and subjective soreness assessed using a visual analogue scale. Throughout the ingestion period a daily food journal was kept. On day seven, participants performed a 10x10 depth jump workout to induce DOMS. Pain tolerance and subjective soreness was measured using the same procedures as day one 24 h and 48 h post-exercise. Results: Data will be presented at SSD.

HENRY HALL ATRIUM 071

Estimating Force During Core Stix Resistance Training

Participants attending 11:00 AM - 12:00 PM, 1:00 PM - 2:00 PM, 3:00 PM - 4:00 PM
Presenters: Robert Albert, Chandler Babb, Patrick Hoxie, Joshua Olson
Mentor: Stephen Glass

A variety of strength training technolgies exist that do not utilize loads (weights) but rather materials that provide resistance by stretching or bending. Core Stix is a resistance technology that uses fiberglass polymer poles to provide resistance through a range of motion. The poles insert into metal holes at various angels, providing a range of movements. However there is no published information regarding the amount of force needed to move the poles through a range of motion. Additionally, there are different hand placement options, which also alter force. This presentation will present data collected using a manual force guage and clinometer to measure force across 10 degree increments, 4 different hand positions, and 5 different resistance poles to document the loading scheme of the technology.

HENRY HALL ATRIUM 072

Perceptions and Use of Technology in Education: A Statistical Consulting Experience

Participants attending 10:00 AM - 11:00 AM
Presenters: Kyle Decker, Kyle Gomez
Mentors: John Gabrosek, Tracy Russo

Professor Tracy Russo, a professor in the Department of Education, conducted a survey with her EDT 370 classes asking students three things they liked and disliked about technology use in the classroom. The survey was given to her students as the semester began as well as at the end. The responses were collected and turned into quantitative data so that it could be analyzed. As the statistical consultants, we helped to quantify the original data and then ran analysis to obtain our results. We compared the students' views on technology use in the classroom from the beginning of the semester to the end to see if there were any trends in the data. We will present on our findings and discuss what we have learned through this consulting process.

HENRY HALL ATRIUM 073

Epiphytic Fern Distribution

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenter: Matthew Biener
Mentor: Gary Greer

Ferns are a major component of wet-tropical floras and thus important to ecosystem function. Most tropical ferns are epiphytes, subjected to strong vertical gradients. Increasing height on a tree trunk correlates with increasing exposure to sunlight, heat, and wind and therefore water loss. The goal of this study was to identify anatomical features associated with the distribution of the eighteen most common fern species inhabiting the bottom three meters of a tree trunk in mid-elevation rainforest of El Yunque National Park, Puerto Rico. The stem, stipe, and leaf of each species were macerated to separate conductive cells, permanent slides were produced, and and conductive cells were photographed and used to measure key hydraulic traits that we suspect to be important determinants of species distribution on the vertical gradient of a tree. Our results found statistically strong associations between some of the traits surveyed and vertical position and abundance on a trunk.

HENRY HALL ATRIUM 074

Does Materialism Predict Body Hair Removal Among Undergraduate Males and Females?

Participants attending 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 4:00 PM - 5:00 PM
Presenters: Brianna Ballew, Stacey Mathieu, Stephanie Rann
Mentor: Donna Henderson-King

Previous research indicates that materialistic individuals are more likely to want to alter their bodies (Henderson-King & Brooks, 2009). This study focuses specifically on the relationship between materialism and body hair removal. We collected information about the frequency of body hair removal, reasons for hair removal, and materialism (Richins & Dawson, 1992). Preliminary findings indicate that males and females do not significantly differ on materialist values. Correlational analyses reveal that for women, materialism is related to frequency of hair removal for several body sites; for men, however, materialism was related to body hair removal for only a single site.

HENRY HALL ATRIUM 075

Acute Effects of Self-Myofasical Release Techniques and Active Recovery on Lactate Levels

Participants attending 10:00 AM - 11:00 AM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Mark Baker, Rachel Bendewald, Alexander Eason, Jacklyn Hensel, Emily Hohman, Megan Pipe
Mentor: Amy Gyorkos

The aim of this study was to determine the effects of active recovery and forms of self-myofascial release (SMR), “The Stick” and foam rolling, on the removal of lactic acid post exercise. College students volunteered to participate in a 4 weeklong study consisting of 4 testing sessions. In all trials subjects completed a Wingate test, a 30 second sprint on a cycle ergometer. Lactate levels were taken immediately after each trial and every 3 minutes post exercise for 18 minutes. In the active recovery trial subjects remained on cycle ergometer and pedaled at 50 rotations per minute (RPM) with zero resistance. In the SMR and foam roll trials subjects followed protocol directing them to roll “The Stick”/foam roll on the quadricep from the crease of the hip to the knee on each leg continuously. In the nonrecovery trial, subjects stayed seated while lactate was taken. Data from each trial were assessed to determine their effects on lactate levels post exercise.

HENRY HALL ATRIUM 076

Improvement of Drosophila Genomic Sequence Using Consed in a Classroom Setting

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenters: Thomas Balzeski, Elizabeth Croff, Nicholas DeJong, Mariah Hampton, Myles Mowery, Andrew Paulosky, Charlotte van Noort
Mentor: Martin Burg

Next generation sequencing is a useful tool for sequencing genomes relatively quickly and affordably. However, DNA sequence output is not infallible and the consensus sequence of a genome needs to be checked manually for errors. The Genomics Education Partnership offers an opportunity for undergraduate students to contribute to the improvement of Drosophila (fruit fly) genomic sequences. The goal of the work reported was to improve DNA sequence from different Drosophila species for future annotation projects. Using Consed, a program used for sequence alignment and analysis, consensus sequence anomalies such as gaps, high quality discrepancies, and low depths of coverage were corrected with approaches such as manual nucleotide base substitution. Primers were designed to resolve regions of the consensus sequence that contained gaps or low coverage regions. Once the consensus had been improved, the DNA sequence was

sent to the Genomics Education Partnership for project reconciliation.

HENRY HALL ATRIUM 077

Alzheimer's Disease And The Connection To GAP-43

Participants attending 3:00 PM - 4:00 PM
Presenter: Marie Wallich
Mentor: John Capodilupo

As the war continues, researchers grasp for the undiscovered key to prevent, treat, and cure Alzheimer's. A potential key could be GAP-43 (growth-associated protein); the purpose of this research is to better understand the relationship between GAP-43 and Alzheimer's Disease. Previously gathered Baboon brain is used to extract GAP-43 though centrifuging, then two-dimensional gel electrophoresis is employed to allow us to separate the protein. Quantification of the spots to identify isoforms, comparison of internal rations, phosphorylation and sprouting are all investigated as well as their relation to the diseased brain throughout this experiment.

HENRY HALL ATRIUM 078

Compassion Fatigue in Veterinarians: A Case Study

Participants attending 11:00 AM - 12:00 PM
Presenter: Sarah Lamar
Mentor: Terry Trier

Compassion fatigue is an increasingly common disorder that negatively impacts those in the caregiving and healthcare professions and is described as a "syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment" (Maslach, 1982). Burnout often leads to feelings of dissatisfaction, decreased ability to communicate interpersonally, and emotional withdrawal (Sprang et al., 2007). A systematic review of published studies found the relative risk for male veterinarians aged 45-64, when compared against men of the same demographic outside of the profession, to be 5.62. For females aged 16-64, the relative risk in veterinarians was found to be 7.62 (Bartram and Baldwin, 2010). The socio-economic area of practice served as a reliable indicator of suicide-risk (p value <0.001). Those veterinarians practicing in the most affluent areas presented with a risk for suicide that was one fourth that of those practicing in the least affluent areas (Tran et al., 2014).

HENRY HALL ATRIUM 079

The Efficacy of Hippotherapy on Storytelling Ability in the Communication Abilities of Spanish-speaking Individuals with Traumatic Brain Injuries

Participants attending 9:00 AM - 10:00 AM
Presenter: Sarah Tibble
Mentor: Beth Macauley

Hippotherapy, the use of horses in therapy, has proven to facilitate the improvement of physical and cognitive abilities. Because of these findings, this research investigated the efficacy of hippotherapy in facilitating improved higher cortical functioning. This study assessed whether or not hippotherapy improved the higher cortical task of storytelling over the course of treatment.Six audio recordings of a Spanish-speaking individual with a traumatic brain injury were transcribed and analyzed with SALT linguistic software. If the results support this hypothesis, hippotherapy could become an effective treatment for patients suffering from traumatic brain injuries.

HENRY HALL ATRIUM 080

Fragment-Based Drug Discovery of a Novel Inhibitor of OXA-24 β-Lactamase

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenter: C'arra Miller
Mentor: Rachel Powers

β-Lactam antibiotics are the most prescribed antimicrobials. Unfortunately, due to overuse, bacteria have become resistant, using the expression of b-lactamases to hydrolyze the β-lactam ring, rendering these drugs inactive. The carbapenem-hydrolyzing subset of class D β-lactamases, which includes OXA-24, is problematic, as carbapenems are used as last resort drugs. To combat this resistance, combination therapies of an antibiotic with a β-lactamase inhibitor have been used, but β-lactamases have gained resistance to inhibitors from a shared β-lactam scaffold. To address this, molecular docking was used to identify novel inhibitors for OXA-24. A novel lead was identified, and using this as a scaffold, nine analogs were ordered and tested. Three had improved inhibition against OXA-24, and three crystal structures were obtained with these analogs. The crystal structures will be analyzed for insights into optimizing these novel inhibitors of OXA-24 β-lactamase.

HENRY HALL ATRIUM 081

Transient Even and Odd Order Nonlinearity of a YBCO Transmission Line

Participants attending 2:00 PM - 3:00 PM
Presenter: Richard Huizen
Mentor: Geoffrey Lenters

Second (IMD2) and third (IMD3) order intermodulation distortions were found to exhibit dependencies on temperature and magnetic field. A carrier wave at the 890 MHz resonant frequency of the type-II YBaCuO superconducting resonator circuit, with Tc=89K, was introduced into the circuit via an electric coupling antenna. Two o-resonance probe signals were injected into the circuit via a separate magnetic coupling element. The combination of these three signals locally excited synchronous second and third order IMD. A static magnetic field was applied perpendicularly to the film which induced magnetic flux vortices in the sample. Upon removal of the static magnetic field, IMD2 and IMD3 exhibited distinct transient decay modes correlating to temperature. Between 85.0K and 87.5K, IMD3 decayed exponentially. Above 87.5K, IMD3 exhibited bounded exponential growth, while within a narrow temperature range around 87.5K, removal of a static magnetic field strongly suppressed IMD3.

HENRY HALL ATRIUM 082

A Statistical Consulting Experience: An Exploration of the GVSU Homepage Usage

Participants attending 3:00 PM - 4:00 PM
Presenters: Hoang Le Nguyen, Kristen Rupe
Mentors: John Gabrosek, Dave Poortvliet

A multitude of diverse users visit the GVSU homepage online every day. Dave Poortvleit from the Institutional Marketing department at GVSU wanted to explore the idea of enhancing the page to be more user friendly through customization. The main focus of customization was aimed towards the type of device from which the page was accessed: mobile devices, desktop/laptop computers, and tablets. Our statistical experience entailed a large amount of exploratory analysis in hopes of identifying trends and patterns from homepage visitors to help create a better and more customized experience.

HENRY HALL ATRIUM 083

Spurious Noise Acceleration of Laser Interferometer Space Antenna Spacecraft Due to Solar Wind

Participants attending 1:00 PM - 2:00 PM
Presenter: Barrett Frank
Mentor: Brett Bolen

The Laser Interferometer Space Antenna (LISA) is a proposed apparatus designed to detect gravitational waves by reflecting laser beams off proof masses. Measurements from LISA depend upon the isolation of the proof masses housed in each satellite. Acceleration of spacecraft due to solar wind can compromise measurements. Current LISA proposals include thrusters to keep spacecraft on their planned trajectories, thereby counteracting forces on the order of N. Utilizing data from the Advanced Composition Explorer (ACE), a spaceborne craft which has collected data since 1998, we calculated forces experienced by LISA spacecraft due to solar wind over an entire solar cycle. This calculation will give insight into how often forces occcur that the thrusters cannot correct for, as well as assist in determinating the solar wind contribution to LISA noise. Information acquired will be crucial in the planning of LISA missions, as well as future detection of gravitational waves.

HENRY HALL ATRIUM 084

Chaos in a Chua Circuit

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM
Presenter: Kevin Bertschinger
Mentor: Benjamin Holder

We analyzed the synchronization of chaotic oscillators using the example of a Chua circuit, *via* computer simulations and experiment. Chaos is found in nonlinear deterministic differential equations with 3 or more dynamical variables, and is characterized by sensitive dependence to initial conditions. Despite the unpredictability of a chaotic system – due to the exponential divergence of nearby trajectories – two coupled chaotic systems can be synchronized. Synchronization of chaos means that two systems with different initial conditions will converge to the same trajectory, and remain in phase for all time. This is similar to audience members synchronizing their applause. Using numerical and experimental techniques we analyzed a well-known chaotic circuit known as the Chua circuit, an LRC circuit with a nonlinear element, and looked for parameter values that led to chaos. Once we established chaotic parameter values we synchronized two Chua circuits experimentally and numerically.

HENRY HALL ATRIUM 085

Michigan Wine Tourism - What Future?

Participants attending 9:00 AM - 10:00 AM
Presenter: Audrey Spidle
Mentor: Michael Scantlebury

This paper examines the wine industry in Michigan, including the locations of wineries and their role in Michigan's tourism. The paper examines the history of wine in the United States and the state of Michigan and its importance to both of these economies. Terroir contributes to the uniqueness of the wine and coupled with the cultivar, and the experience and professionalism of the vigneron, are combined into a recipe for an excellent beverage. This research paper looks at both professional and academic programs available across the state in order to build the infrastructure for the future development of the industry. This research will showcase the progression of wine tourism in Michigan and the education that will be needed to advance the industry.

HENRY HALL ATRIUM 086

Statistical Consulting Experience: Therapeutic Recreation for Youth at Risk

Participants attending 3:00 PM - 4:00 PM
Presenters: Adam Heiss, Joseph McCartney
Mentors: Dawn De Vries, John Gabrosek

Dr. Dawn De Vries, a therapeutic recreation faculty member, worked together with Kick and Cook-a-Palooza. The goal of this was to provide a nutrition and physical activity program for children that are classified as youth at risk, emphasizing on the physical activity component. This program would teach the children different games and recipes they could use during the event which they could apply to their own lives to have a healthier lifestyle. Two different sessions were held with differing methods and involvement, one in the fall of 2014 and the other in the winter of 2015. As the statistical consultants working on this project, our job was to analyze the data from the different sites and sessions to compare them based on responses to a questionnaire that was filled out after each session. The main goal of this project is to see if there was a statistical difference between the effectiveness of the first and second session.

HENRY HALL ATRIUM 087

Primate Lower Limb Comparative Anatomy

Participants attending 10:00 AM - 11:00 AM
Presenter: Logan George
Mentor: Melissa Tallman

The understanding of primate anatomy, specifically the differences between taxa, is critical to understanding the evolution of human anatomy. The focus of this study is to observe and describe the differences and similarities among the gross muscular anatomy of multiple non-human primate taxa. It will be carried out through the direct dissection of primates' lower limbs, and the origin, insertion, weight, and photos of each muscle in situ and individually will be documented. Five taxa will be included: *Saimiri*, *Macaca*, *Papio*, *Aotus* and *Chlorocebus*. This type of research is imperative, specifically because there is limited equivalent information available. The data from this project could not only corroborate our current knowledge regarding the similarities between primate and human anatomy, but it could serve as a basis for future studies to further research specific aspects of human evolution.

HENRY HALL ATRIUM 088

Causes of Deformation in Point Pleasant Formation, Northern Kentucky

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Andrew Alder, Kyle Gregory, Joseph Nichols, Sara Thurkettle
Mentor: Peter Riemersma

In several areas of the upper Ordovician Point Pleasant Formation in northern Kentucky, deformation of limestone strata can be seen at the mesoscale, ranging from 20cm to 100cm, all the way down to microscale, in that of a single calcite grain; ~1cm diameter. The deformation is found amidst undeformed layers of limestone and interbedded shale from a shallow marine environment. The deformation at the mesoscale is represented by folding of lamina. At the microscopic scale single calcite grains observed under the petrographic microscope show evidence of crystal plasticity. Possible mechanisms of the deformation at this outcrop include convolute bedding, partial liquefaction of sediments shortly after deposition, and seismic shaking from earthquakes producing seismites, a potential impact from the Taconic orogeny. Assessment of samples from deformed and undeformed thin sections and hand samples are examined to determine dominant mechanisms of deformation.

HENRY HALL ATRIUM 089

Analysis of the Relative Timing of Dolomitization and Chertification Events in the Silurian Brassfield Formation, Northern Kentucky

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM
Presenters: Cody Garnsey, John Howlett, Valerie Voisin, Danielle Wilcox
Mentor: Peter Riemersma

The Silurian Brassfield Formation contains evidence of widespread diagenetic changes. The former limestone at the outcrop has undergone dolomitization and chertification. The distribution of chert in the Brassfield ranges from large beds to small nodules. The presence or absence of fossils can be used to examine the relative timing of these events. Dolomitization tends to destroy fossil fabric; presence of fossils only in chert nodules will prove that silicification preceded and protected fossils from dolomitization. Possible sources of the silica necessary for this chert deposition can be from siliceous sponges that co-existed with carbonate-secreting organisms within the formation. An analysis of hand samples with corresponding thin sections will provide evidence as to whether the dolomitization events occurred before or after chertification.

HENRY HALL ATRIUM 090

Proposed Signs of Subdural Hematoma Prior to Death

Participants attending 9:00 AM - 10:00 AM
Presenter: Kevin Quinn
Mentors: Cara Ocobock, Timothy Strickler, Laura Stroik, Cynthia Thompson

A subdural hematoma (SDH) is a type of intracranial hemorrhage at the arachnoid-dura interface that is common among the elderly following head trauma. The objective of this project is to investigate the effects that SDH had on the anatomy of the brain and how the resulting abnormalities alter neurological functions. The brain of a 103 year old female cadaver was used to observe the impact SDH had on normal brain anatomy. The SDH located in the right parieto-occipital cortex will influence: motor functions, vision, sensation, and speech. Pressure exerted on the brain from SDH compressed the tissue, leaving a depression in the region of the brain described above. The SDH creates pressure which alters the brain’s anatomy and manifests in detectable neurological signs in the elderly.

HENRY HALL ATRIUM 091

Cardiovascular Screening: Clinical Implications and Cost-Efficiency with the Addition of ECG to a Pre-Participation Assessment

Participants attending 2:00 PM - 3:00 PM
Presenter: Sara Helder
Mentor: Brian Hatzel

Background: A number of athletes are found with abnormal heart conditions, but not due to routine Pre-Participation Exam (PPE). The use of an electrocardiogram (ECG) isn't recommended in the U.S. for athletes because of diagnostic sensitivity. Objective: The objective of the following systematic review is to access all studies related to the diagnosis capabilities of ECG and PPE, and conclude their findings about the addition of ECG to a PPE. Methods: Ten original studies were found through inclusion and exclusion criteria based on the objective. The studies we retrieved between the dates of September-December 2015 from databases: PubMED, Science Direct, CIHNL, and ProQuest Medical Library. Results: Significant results from the studies conclude that an ECG increases sensitivity when added. In one study, sensitivity increased from 45% to 98.9%. Conclusion: The addition of an ECG, as a diagnostic tool, can have clinical implications for determining unknown cardiovascular abnormalities.

HENRY HALL ATRIUM 092

The Effects of Climate Change on the Hydrologic Cycle of the Rocky Mountains in the Western United States

Participants attending 9:00 AM - 10:00 AM, 1:00 PM - 2:00 PM
Presenter: Ashley Edwards
Mentor: Elena Lioubimtseva

Throughout the world, mountains are known for their natural beauty and intrinsic value, but have a socioeconomic importance by providing downstream cities with water, agricultural land, tourism, and timber. Climate change is affecting mountainous regions by altering pinnacle hydrologic processes, the cryosphere, geomorphologic processes, and overall ecological systems. The study question focuses on the extent of climate change in mountainous regions, and how this will ultimately affect the socioeconomic value of these areas. MAGICC/SCENGEN software was utilized to develop AOGCM projections of precipitation and temperature changes under several climate policy scenarios in the Rocky Mountains of the Western United States. Lower precipitation and higher temperatures will lead to a decrease in snow cover, permafrost degradation, increased landslides, decreased river discharge and increases in sediment yields. These changes negatively affect human/socioeconomic uses of the Rocky Mountains.

HENRY HALL ATRIUM 093

Design of Low-Coordinate Transition Metal Alkoxides for the Activation of Small Molecules

Participants attending 12:00 PM - 1:00 PM
Presenter: Alyssa Cabelof
Mentor: Richard Lord

Transition metal imido complexes supported by bulky alkoxides are reactive molecules due to mechanical inhibition of desired bond formation at the metal center. These compounds show great promise for reductive chemistry, a class of reactions that combine two or more molecules to make value-added species when adding electrons. These types of molecules and reactions are of particular interest to NASA because it is possible that the green house gas CO_2 can be reductively coupled into a renewable fuel. My project used both computational and experimental approaches to better understand how to encourage reductive coupling. Computationally, we measured the orbital energy of metal complexes supported by bulky alkoxide ligands with a variety of substituents. Experimentally, quasi-two coordinate structures for iron and chromium were isolated. The results of this combined computational and experimental approach, and the reactivity of one of these complexes with CO_2, will be discussed.

HENRY HALL ATRIUM 094

BBr_3-Initiated Cyclization of o-alkynylanisoles to Form Benzofurans

Participants attending 11:00 AM - 12:00 PM
Presenter: Talon Kosak
Mentors: Andrew Korich, Richard Lord

Benzofuran-containing natural products and their synthetic derivatives exhibit a broad range of pharmacological activity including anticancer, antiviral and antifungal. Due to the biological importance of these systems, the benzofuran skeleton has been the target of several research groups. As such numerous techniques have been developed, however, many of these methods employ either complex precursors or expensive and toxic metal catalyst. Therefore, in collaboration with the Lord research group at GVSU, we have developed and mechanistically studied a new approach to preparing benzofurans. Our method eliminates the need for a metal catalyst and starts with relatively simple o-alkynylanisoles.

HENRY HALL ATRIUM 095

Silaallyl Anions: Synthesis and Characterization

Participants attending 2:00 PM - 3:00 PM
Presenter: Eva Gulotty
Mentor: Randy Winchester

The silaallyl anion has two major contributing resonance structures; one way to determine the relative importance of those resonance structures is to study the barrier to rotation using temperature dependent NMR. Lithium and potassium vinylbis(trimethylsilyl)silyl salts have been synthesized. Those anions were characterized via ^{1}H, ^{13}C, and ^{29}Si NMR. The reactivity of the silaallyl anions was studied using the characterization of their quench products with known electrophiles. The anion precursor tris(trimethylsilyl)-((9H-fluoren-9-ylidene)methyl)silane was synthesized to study the effect of an aromatic addition to the silaallyl system. The discussion of that synthesis will include the formation of a novel fluren-9-ylidene dimer. Another way to investigate the bond behavior is through coordination with transition metals, so the attempts to complex these silaallyl anions to transition metals as ligands will also be presented.

HENRY HALL ATRIUM 096

Testicular Development in Sprague-Dawley Rats Exposed to the Herbicide Atrazine

Participants attending 1:00 PM - 2:00 PM
Presenter: Gabrielle Keb
Mentor: Christopher Pearl

Atrazine, an herbicide used globally, is a potential endocrine disruptor. Adult testicular function depends on proper development prior to puberty, a time which is also most sensitive to endocrine disruption. This study investigates the effects of atrazine on testicular development by examining prepubescent rats at post-natal day 21 (PND21) after exposure during development. Female rats were treated daily during pregnancy and lactation by oral gavage in three dosing groups: 10 mg/kg (ATZ high), 100 µg/kg (ATZ low), and corn oil only (control). Thus, pups were exposed to atrazine in utero and while nursing until PND21. At PND 21, control and ATZ high animals have similar body and testis weights, but animals in the ATZ low group have an increased body and testis weight. The diameter of seminiferous tubules were larger than control in both ATZ high and ATZ low groups. These data suggest that atrazine may be causing advanced testicular development and premature puberty.

HENRY HALL ATRIUM 097

Discovery of an Abnormal Muscle “Bridge” Connecting Brachialis and Brachioradialis

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenters: Aaron Overbeck, Eric Pearson, Anton Petrenko, Jordan Pretto
Mentors: Cara Ocobock, Timothy Strickler, Laura Stroik, Cynthia Thompson

The brachialis muscle was originally thought to be innervated by the musculocutaneous nerve branching from the lateral cord of the brachial plexus. However, previous research has found that brachialis can be innervated by both the musculocutaneous and radial nerves. Upon dissection of a male cadaveric specimen, we found that in this individual, many muscle fibers of brachialis were connected to the brachioradialis muscle, a muscle innervated by the radial nerve. We hypothesized that in this specimen, the brachialis muscle is dually innervated by both the musculocutaneous and radial nerves, as this muscle fiber “bridge” could serve as a passageway for the radial nerve. We traced the paths of the musculocutaneous and radial nerves to look for any branches that would suggest that the brachialis in this cadaver is receiving dual innervation. We found that brachialis is innervated by both the musculocutaneous and radial nerves, solidifying the hypothesis of dual innervation of this muscle.

HENRY HALL ATRIUM 098

A Deadly Combination: Subdural Hematoma and Contralateral Cerebral Edema

Participants attending 2:00 PM - 3:00 PM
Presenter: Samantha MacKay
Mentors: Cara Ocobock, Timothy Strickler, Laura Stroik, Cynthia Thompson

Acute subdural hematomas are caused by severe trauma, typically a fall or motor vehicle accident. The mortality of this condition is associated with the promptness of treatment, thickness of hematoma and subsequent complications. Contralateral cerebral edema is common in cases which skull fractures occur. However, edema can also occur as a result of erythrocyte lysis, hemoglobin products’ toxic effects on the neural tissue and the increased permeability of the blood brain barrier. Upon removing the calvaria of an 86 year old cadaver, the subdural hematoma from a traumatic fall 13 days prior to death was revealed along with severe contralateral edema with no evidence of skull fracture present. There is an increased risk of mortality and severe complications associated with cerebral edemas caused by erythrocyte lysis rather than trauma induced edema. Therefore, it is likely that the cerebral edema in this case was the main contributor to cause of death.

HENRY HALL ATRIUM 099

The Influence of Sex and Age on Thermoregulatory Hormones in Japanese Snow Monkeys (*Macaca fuscata*)

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Kismet Gray, Alex Green, Brianna Powell
Mentor: Cynthia Thompson

It is known that thermoregulatory patterns differ with sex and age in humans. However, it is unclear whether these variables affect thermoregulatory hormones in wild primates. This study assessed the influence of sex and age on levels of the freely circulating thyroid hormone triiodothyronine (fT_3) in a group of semi free-ranging Japanese macaques (*Macaca fuscata*). Fecal samples were collected in winter and summer seasons, stored at -80°C, extracted with ethanol, and analyzed for fT_3 via ELISA. Statistical analysis showed no significant differences in fT_3 levels between sexes. Age categories (juvenile, adult, and elderly) explained 9.3% of the variation in fT_3 levels, with juveniles consistently exhibiting higher fT_3 levels compared to elderly macaques. This difference most likely reflects thyroid hormones' role in growth processes. Our data suggest that differences seen in fT_3 between the sexes and in elderly individuals are not a result of thermoregulatory hormones in *M. fuscata*.

HENRY HALL ATRIUM 100

Aging with Disabilities

Participants attending 11:00 AM - 12:00 PM
Presenter: Elizabete Saukas
Mentors: Raymond Higbea, Priscilla Kimboko

Through literature review and interviews with some professionals in the field of aging, the purpose of this paper was to look into some of the challenges faced by unimpaired and impaired older adults to age in their own homes and neighborhoods. Population aging is likely to raise the number of households with disabled residents. Given the social isolation and risk of injury caused by architectural barriers, the desire of most people to live independently for as long as possible, and the high cost of institutionalization, these trends point to a substantial worldwide need for accessible housing. Providing assistive services at home is less costly than providing those services in an institutional setting (Smith, 2012).

HENRY HALL ATRIUM 101

The Silurian and Devonian Unconformity at the Bisher Formation in Northern Kentucky

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenters: Jaren Miller, Kelsy Murphy, Chelsey Roth, Scott Tackett
Mentor: Peter Riemersma

The Middle Silurian Bisher Formation is separated from the overlying Devonian Ohio Black Shale by an unconformity representing 38 million years of missing time. The now dolomitized limestones of the Bisher record shallow water marine conditions while the Ohio Black Shale is interpreted to represent deep, potentially anoxic water conditions. We are interested in characterizing the unconformity and the nature of this sea level rise. The top of the Bisher will be examined for evidence of reworking, erosion, burrowing, and condensation. We'll also compare hand samples and thin sections from the top to samples within the Bisher to highlight textural and diagenetic differences.

HENRY HALL ATRIUM 102

Methods for Analysis of Molecular Dynamics Simulations

Participants attending 2:00 PM - 3:00 PM
Presenter: Zachary Klamer
Mentor: Agnieszka Szarecka

Molecular dynamics (MD) simulations are a computational tool to observe different conformations a biomolecule can adopt over time. MD-simulations can produce data sets which are difficult to analyze due to the large number of atoms in motion and the complexity of the motions that occur. Additional analytical tools are needed to better understand the relationship between dynamics and function of the simulated system. In this project I investigated methods such as principal component analysis, clustering, and dynamic network analysis and their usefulness in extracting information from simulations. These techniques were used to analyze two separate molecular dynamics simulations of the enzyme β-Lactamase OXA 66 and its P130Q mutant. These techniques allow us to characterize aspects of the protein's movements and identify key structural elements affected by this mutation, which provides insight into the development of antibiotic resistance in class D β-lactamases.

HENRY HALL ATRIUM 103

A Premliminary Assessment of Implementing Stream Daylighting Strategies on Little Black Creek in Muskegon County, MI

Participants attending 10:00 AM - 11:00 AM, 3:00 PM - 4:00 PM
Presenter: Logan Knoper
Mentor: Tara Kneeshaw

Daylighting is a new stream restoration technique being used where natural streams have been redirected through underground culverts and combined with storm sewer systems. Daylighting involves unburying these streams. This technique is done not only to restore natural stream habitats, but to address many urban Issues. This study was conducted on in Muskegon County, MI. Spatial understanding of the length of culverted portions of Little Black Creek as well as its proximity to the downtown area were key factors in constructing an assessment. In addition, water level data were collected at three study areas along the creek in order to evaluate the changes in water level during rain events. In some instances, additional stream profiles and hydrochemical data were collected to further understand the health of the stream. The results from this preliminary assessment highlight the pros and cons of implementing daylighting strategies on portions of Little Black Creek.

HENRY HALL ATRIUM 104

Effect of Post-Exercise Rolling on Perception of Delayed Onset Muscle Soreness

Participants attending 3:00 PM - 4:00 PM
Presenters: Nicholas Feldpausch, Keven Fishero
Mentor: Ross Sherman

Background: Delayed onset muscle soreness (DOMS) is known to peak 24-48 h post exercise and can inhibit recovery and effective therapy. Myofascial release through the use of foam rolling has been shown to alleviate pain and can aid recovery and performance. Purpose: To determine if post-exercise foam rolling is an effective method for diminishing the effects of DOMS. Methods: 8 participants free of lower body injuries and familiar with free weights completed the study, which used a randomized crossover design. Participants avoided high intensity or eccentric exercise 48 h prior to testing. 10x10 barbell back squats (4 s eccentric; 1 s concentric) were performed followed by rolling of one leg (1 min per major muscle group). Perceived and measured soreness using a visual analog scale and digital pressure gauge respectively, was used to assess the effectiveness of foam rolling as compared to the unrolled contralateral leg 24 and 48 h post exercise. Results: Data will be presented at SSD.

HENRY HALL ATRIUM 105

Effects of Pre-Workout on Muscular Strength and Endurance in Resistance Trained Individuals

Participants attending 10:00 AM - 11:00 AM
Presenters: Peter Galloup, Patrick Miazgowicz, Ryan Mouland
Mentor: Ross Sherman

Background: The use of pre-workout supplementation in athletic performance has become a popular and controversial topic for recreational and sport specific usage. However, examination of acute pre-workout supplementation has yet to be examined in detail. Purpose: The purpose of this study is to determine if acute ingestion of pre-workout affects muscular strength or endurance in resistance-trained individuals. Methods: Eight resistance trained college students participated in this study. Participants refrained from taking pre-workout for at least two weeks prior to participation. A randomized crossover design with coin-toss for order allocation was used. Prior to testing, baseline muscular strength (1 rep max [1RM]) and endurance (75% 1RM to fatigue) were assessed. Three days afterwards, participants consumed either pre-workout or a blank and then performed the same 1RM and muscular endurance tests, with three to seven days between the trials. Results: Data will be presented at SSD.

HENRY HALL ATRIUM 106

Effects of Acute Caffeine Ingestion on Repeat Sprint Performance

Participants attending 9:00 AM - 10:00 AM
Presenters: Nicholas Veitengruber, Kathryn VerMerris, Samantha Zettelmaier
Mentor: Ross Sherman

Background: Previous research has been conducted to highlight the beneficial effects of caffeine ingestion on aerobic and endurance exercise, but few studies have examined the effects of caffeine on anaerobic processes such as repeated sprints. Purpose: The purpose of this study was to determine the impact of acute caffeine ingestion on repeat sprint performance. Methods: Ten college-age students participated in this study, which used a randomized cross-over design with coin toss for allocation. Participants were considered unhabituated to caffeine and refrained from exercise 12 hours prior to testing. Participants ingested either 5 $mg \cdot kg^{-1}$ body mass of caffeine or placebo. One hour after ingestion, participants completed 10 x 50m sprints with 40 seconds' rest between each sprint. Blood pressure, heart rate, blood glucose, and perceived exertion were measured before and after each test along with sprint times measured using infrared light gates. Results: Data will be presented at SSD.

HENRY HALL ATRIUM 107

Influence of Hydration Status on Assessment of Body Composition

Participants attending 10:00 AM - 11:00 AM
Presenters: Nicole Luevano, Ellenor Peebles, Kaylin Walters
Mentor: Ross Sherman

Background: Studies have shown hydration levels influence the measure of body composition within specific populations such as those with chronic diseases and also athletes. Purpose: The aim of the study was to assess the change in hydration status on measurement of body composition. Method: Eight healthy participants were randomly assigned to follow both a 12 h hydration and 12 h dehydration protocol prior to testing on two different days, separated by at least 48 h. Body composition tests included a seven-site skinfold assessment and foot-to-foot bioelectrical impedance analysis. Urine specific gravity (USG) was used to confirm hydration status, with the hydrated and dehydrated thresholds set at USG<1.01 and USG>1.02, respectively. Results: Will be presented at SSD.

HENRY HALL ATRIUM 108

The Effects of Foam Rolling on Post-Plyometric Exercise Delayed-Onset Muscle Soreness in College-Aged Individuals

Participants attending 12:00 PM - 1:00 PM
Presenters: Christina Falahee, Jesse Pelkey, Lance Phan
Mentor: Ross Sherman

Background: Delayed-onset muscle soreness (DOMS) occurs following eccentric or unaccustomed exercise. Myofascial release, specifically foam rolling is used to minimize DOMS. Purpose: Identify if foam rolling improves DOMS following eccentric exercise. Methods: Eight healthy individuals participated in a randomized cross-over design, they refrained from lower body exercise 48 hours prior to testing. Range of motion (ROM) and thigh girth collected. Testing consisted of 10X10 reps of depth jumps from an 18” box. Subjects foam rolled for two sets of 60 secs each on the quadriceps & hamstring on one leg. Quads & hamstring ROM assessed using a goniometer & thigh girth with a measuring tape at a 90° angle at line of femur & midway between proximal border of patella & inguinal crest post-testing. Soreness assessed post-testing with a digital pressure gage standing up & one-rep squat using visual analog scale. Measures taken immediately, 24h, & 48h post-exercise. Results: Presented at SSD.

HENRY HALL ATRIUM 109

Cognitive Factors in Perceiving Image Size

Participants attending 12:00 PM - 1:00 PM
Presenter: Christopher Saikalis
Mentor: Leon Lou

Human vision is mostly concerned with perceiving objects in the world. It is possible, however, to focus on the image that represents the object. As part of a larger project, the current study aims at understanding how distance cues and mental imagery influence the perception of image size. Participants are volunteers or recruited from the GVSU Psychology Department research subject pool. They are tested with 2D displays each containing two circular or oval shaped targets that are either surrounded by pictorial distance cues or stand alone. In the latter case, mental images of the same pictorial distance cues are elicited with instructions. In all cases, participants have to view the display as situated in a 3D setting and the two targets as 2D images. Their responses indicate the relative size between the two targets. The result of the study will inform a theory of visual perception that goes beyond the conventional focus on object constancy.

HENRY HALL ATRIUM 110

Bacillus cereus Bacteriophage Rescue in Great Wax Moth Larvae

Participants attending 12:00 PM - 1:00 PM
Presenter: Kelsie Nauta
Mentor: Steven Hecht

Antibiotic resistance is an exponentially growing concern in the medical field. Bacteriophage therapy is a developing technique used to combat the development of highly resistant strains of bacteria. Bacteriophages are a type of virus that are highly specific and select solely bacterial targets. They invade the host bacteria cell, use the cell's organelles to replicate themselves, then lyse the cell and spread to neighboring cells. Therefore, they can be used to treat infections without harming the infected individual. In addition, bacteriophages often coevolve with their target bacterial strain, reducing the potential for bacterial resistance. The central focus of this study is to determine the effectiveness of using bacteriophages to curb an internally induced *Bacillus cereus* infection in Galleria mellonella larvae.

HENRY HALL ATRIUM 111

Regional Variances of Avian Malarial Infection in *Tachycineta bicolor*

Participants attending 11:00 AM - 12:00 PM
Presenter: Brittany Bunker
Mentors: Michael Lombardo, Patrick Thorpe

Tree swallows (*Tachycineta bicolor*) are known to be infected with avian malaria, but it is unknown why there are variances in infections across geographic regions. Populations of *T. bicolor* surveyed in New York reveal that approximately 50% carried malaria, but populations surveyed in Tennessee show no apparent infection. Previous work has failed to address why the rate of infection varies across different regions, since mosquitos from each area are positive for malaria. Our hypothesis is all populations should show the same rates of infection, but some birds may not show infection due to the stage of malarial development. We are extracting DNA and using malarial PCR primers to test for presence of infection in W. Michigan populations from several different years. Initial results show approximately 25% of samples from 2012 are positive for malaria infection. Additional year samples will clarify if the differences are regional or infection rates are episodic from year to year.

HENRY HALL ATRIUM 112

To Assemble a Crowd: Revolutionary Rhetoric and the Vulgarity of Patriotism

Participants attending 9:00 AM - 10:00 AM
Presenter: Ciara Pink
Mentor: David Eick

Largest in number, loudest in voice, but nearly impossible to unite, the mass of conglomerated civilians entitled the “general populace” could be the doom or the future of a country. Through intensive study of primary-sourced speeches, newspapers, and quotes in addition to the scholarly journals and renowned analyses of the era, a study was formed on the nature of language in the era of the French Revolution of 1789. The effect of elocutionists on the infamous crowd can be attributed to the crowd leaders’ vociferous works. The coercion of such a massive group of people was no small feat and perhaps was only possible through the controversial use of vulgar language. By speaking the common crude language of the people, the crowd leaders swept a much larger portion of the population into politics, enabling them to use the crowd as a tool for their own deeds of justice.

KIRKHOF CENTER GRR 001

Tree Swallow Mobbing Behavior: Predator Recognition vs Neophobia

Participants attending 11:00 AM - 12:00 PM
Presenters: Stacy Keydel, Simeon Koning, Eric Versluis
Mentor: Michael Lombardo

Mobbing is an antipredator defense whereby birds harass or attack predators. Smith and Graves (1978) showed the intensity of Barn Swallow mobbing is primarily determined by the presence and shape of physical characters such as the beak and eyes of a potential predator. We conducted a similar experiment with nesting Tree Swallows to determine whether the mobbing of humans (non-predator) was the result of neophobia (the fear of novelty). We presented nesting Tree Swallows with either stuffed raccoon, human, or plastic paint caps near their nest boxes. We observed mobbing behavior during 5-minute trials. The raccoon model and human elicited strong mobbing responses. The paint cap elicited virtually no responses. This suggests that Tree Swallow mobbing of humans is not due to neophobia. We hypothesize that some physical human character (e.g., eyes) is the primary stimulus for mobbing behavior. We hope to test this with future experiments that utilize eyes placed on a novel object.

KIRKHOF CENTER GRR 002

Tetraspanin Protein Interactions and the Effects on Metastatic Cancer

Participants attending 2:00 PM - 3:00 PM
Presenter: Marina Ibarra
Mentor: Suganthi Sridhar

Understanding the progression of metastatic cancer at the cellular and molecular level are fundamental for engineering effective and efficient treatments. The research focuses on observing changes in protein interactions involved in metastatic prostate cancer cells: CD151 association with C-met in the presence and absence of CD82. The results indicate the overexpression of CD82 in a metastatic cancer cell line significantly reduce the association and regulation between CD151 and C-met; therefore, inhibiting metastasis at the molecular level. Analysis of the specific molecules contributing to metastasis could orchestrate the development of successful targeted drug therapies as treatment for cancer.

KIRKHOF CENTER GRR 003

Classifying 7 Dimensional Indecomposable Solvable Lie Algebras With Niradical Isomorphic to $A_{5,2} \oplus R$.

Participants attending 2:00 PM - 3:00 PM
Presenter: Anthony Pecoraro
Mentor: Firas Hindeleh

This poster is the fourth in a series that examine seven-dimensional solvable Lie Algebras with a six-dimensional niradical. Low dimensional solvable Lie Algebra classification started back in 1963 by Mubarakzyanov, and was completely classified up to dimension six. A general theorem asserts that if *g* is a solvable Lie Algebra of dimension *n*, then the dimension of its maximum nilpotent ideal (called the nilradical) is at least *n/2*. For the seven-dimensional algebras, the nilradical's dimension could be 4, 5, 6 or 7. The four and seven dimensional nilradical cases were classified. We examine the six-dimensional niradical case. We first looked for the six-dimensional nilpotent algebras and found 32 algebras. The first case was completed in 2014, and the second case was completed in 2015. In this project we focus on the class where the nilradical is isomorphic to a direct sum of the five-dimensional algebra $A_{5,2}$ and the one dimensional algebra denoted by $A_{5,2} \oplus R$.

KIRKHOF CENTER GRR 004

Carex pensylvanica Response to Fire and Herbicide Treatments in a Degraded Sand Prairie

Participants attending 9:00 AM - 10:00 AM
Presenter: Kaitlin Alvarez
Mentor: Todd Aschenbach

Sand prairies in Michigan have rapidly declined both in quality and quantity due to agriculture, residential development, and fire suppression. We established a sand prairie restoration experiment in the Manistee National Forest, Michigan in 2013 to evaluate combinations of fire and herbicide treatments to increase diversity in native plants and reduce establishment of *Carex pensylvanica* (Pensylvania sedge). *Carex pensylvanica* is a sedge native to Michigan and sand prairie however, it tends to form dense vegetative mats that dramatically reduce native diversity. Results from 2015 will be used in determining which treatments work best for achieving our ecological objectives.

KIRKHOF CENTER GRR 005

Prophylactic Mastectomy: The Examination of Women's Satisfaction with Their Decision to Undergo Prophylactic Mastectomy Surgery: A Systematic Review

Participants attending 9:00 AM - 10:00 AM, 2:00 PM - 3:00 PM
Presenter: Emily Bush
Mentor: Julia VanderMolen

Background: Breast cancer is the second leading mortality-related cancer, making it the leading cause of general mortality in women ages 40-55 (Pena-Salcedo et al., 2012). The aim of this systematic review was to examine the satisfaction rates of breast cancer survivors who elected to undergo prophylactic mastectomies. Design: Systematic review of the literature published between inception of the databases and August of 2015. Data sources included PubMed, CINAHL, and ProQuest Medical. Results: Fifteen peer-reviewed articles provided a background definition and understanding of a prophylactic mastectomy, quality of life and the satisfaction rates of women who elected to undergo prophylactic mastectomies. Conclusion: The lack of available systematic reviews with a focus on prophylactic mastectomies and their satisfaction rates reveals the need for future studies.

KIRKHOF CENTER GRR 006

A Comparison of American Marten Habitat Use from Data Collected Using VHF Radio Telemetry Versus GPS Telemetry

Participants attending 3:00 PM - 4:00 PM
Presenter: Macy Doster
Mentors: Joseph Jacquot, Paul Keenlance

Our understanding of wildlife habitat use and selection, and therefore our efforts to create or manage suitable habitat are based almost exclusively on research conducted using very high frequency (VHF)-based radio telemetry. We compared home ranges and habitat use of American martens (a small forest carnivore) in the Manistee National Forest based on conventional VHF telemetry and Global Positioning System (GPS) telemetry. VHF-based radio telemetry generally allows the researcher to locate an animal once a day up to once a week. GPS-based telemetry allows locations to be collected once every half an hour, but cost roughly ten times the cost of VHF transmitters. An increased frequency of locations will likely increase our understanding of habitat selection. We evaluated whether the inferences regarding marten habitat use vary between VHF and GPS derived data. We found that these inferences do vary, which may justify the increased cost of GPS transmitters.

KIRKHOF CENTER GRR 007

The Membrane Anchored Protein Mac1 Facilitates Mid1 Localization to Interphase Nodes

Participants attending 9:00 AM - 10:00 AM
Presenter: Zachary Bassler
Mentor: Dawn Hart

It is important to study the mechanisms involved with cell division to better understand diseases such as cancer. A model organism for the study of eukaryotic cell division is the fission yeast *Schizosaccharomyces pombe*, which divides medially by the formation of a protein ring. Formation of this ring is dependent on the proper localization of two types of interphase nodes to the division site. Mid1 is a protein present in all nodes that determines the placement of the ring by anchoring to the cell membrane and recruiting other proteins. Without Mid1, nodes do not form, resulting in defects in division. Exploration of the protein Mac1 reveals that it may be a link between Mid1 and nodes. Visualization of a *mac1*D *mid1-GFP* strain has reduced Mid1 presence at nodes. To investigate the general role of Mac1 in node formation, *mac1*D cells with fluorescently tagged node proteins are also being visualized. This research is supported by the National Science Foundation RUI Award #1157997.

KIRKHOF CENTER GRR 008

Lower Religiosity Associated with Greater Trust

Participants attending 11:00 AM - 12:00 PM
Presenters: Amaya Guthrie, Katelin Leahy
Mentor: Luke Galen

Although previous research indicates that religiosity may be associated with greater trust as measured by economic forwarding to others, it has not fully controlled for the religious identity of the participant vis a vis that of the partner. Introductory psychology participants were allowed to forward a portion of their money via computer to a partner who could potentially return a portion (resulting in mutual benefit), or keep the money. Across conditions, the partner was depicted as either a Christian, an atheist, or of unknown religious identity. We also assessed participant personality traits as well as attributed partner characteristics. Lower participant religiosity was associated with greater trust (i.e., forwarded amounts). Factors such as the participant's personality and attributed partner characteristics partially mediated trust.

KIRKHOF CENTER GRR 009

Effects of Static Versus Dynamic Stretching on Improving Power Output Performance

Participants attending 11:00 AM - 12:00 PM
Presenters: Kira Dosenberry, Lacie Lind, Maria Morgan
Mentor: Ross Sherman

Background: Based on previous research, warming up muscles before an activity is essential prior to exercise, although there is discussion if dynamic or static stretching is more beneficial. Purpose: The purpose of this study is to determine whether dynamic or static stretching prior to exercise improves power output in collegiate female athletes. Methods: Eight female collegiate athletes were assessed using a randomized crossover design for the 40 yard dash and vertical jump test. Baseline testing (40 yard sprint and vertical jump) was done four days prior to trial one. Trial one and trial two were completed two days apart. Testing consisted of a two minute jog followed by a 10 minute dynamic or static stretching warm up. Results: Will be presented at SSD.

KIRKHOF CENTER GRR 010

Microbiology Methodology Independent Study with use of Bacillus Bacteria and Associated Bacteriophages

Participants attending 11:00 AM - 12:00 PM
Presenter: Ellen Tumbarella
Mentor: Anthony Nieuwkoop

Over the course of the past year, GV student Ellen Tumbarella has worked independently with the microbes *Paenbacillus polymyxa*, *Bacillus cereus*, and *Bacillus subtilis*. Early work this past fall focused on producing growth curves and optimizing the growth conditions for these bacteria. This semester's work involves learning procedures to rehydrate and propagate phage stocks, and test their ability to infect certain bacteria. This independent study/research has allowed this student to expand her knowledge of microbiology laboratory procedures and bacterial/phage physiology, in a laboratory setting. Under the supervision of Dr. Nieuwkoop, this student was able to use and develop critical and creative thinking skills important for a future in laboratory science or healthcare.

KIRKHOF CENTER GRR 011

Synthesis and Activity Analysis of Potential FAK Substrate and Inhibitor Peptides Based on the Protein p130cas

Participants attending 9:00 AM - 10:00 AM
Presenter: Emily Ingalls
Mentor: Laurie Witucki

Breast cancer is the most common cancer among women and a major world health issue. The CAS protein family, which includes the protein of interest, p130cas, is known for playing a critical role in breast cancer. The tyrosine kinases, Src and focal adhesion kinase (FAK), as well as phosphorylation of p130cas are associated with cellular adhesion, which stimulates survival signaling and cellular migration initiation in tumor cells. Previous research has produced several tyrosine-containing FAK peptide substrates derived from p130cas. The peptide substrate LS-1 based on p130cas has been determined to have the best FAK phosphorylation activity. This work will present one additional substrate that was synthesized, as well as an inhibitor based on LS-1. The inhibitor was created without a phosphor-acceptor site at the Tyr780 and Tyr782 positions. The substrate and inhibitor were synthesized using solid phase peptide synthesis and analyzed via ongoing radioisotope labeling assays.

KIRKHOF CENTER GRR 012

Impact of Dehydration on Assessment of Body Composition

Participants attending 10:00 AM - 11:00 AM
Presenters: Carley Sika, Emily Simonelli, Kendall Wilterdink
Mentor: Ross Sherman

Background: Hydration status has been shown to affect the assessment of body composition, specifically that dehydration reduces the accuracy of bioelectrical impedance analysis (BIA). Purpose: The purpose of this study is to assess the impact of hydration status on body fat percentage determined by foot-to-foot BIA. Methods: Eight healthy college males participated in this study, which consisted of two phases and used a randomized, crossover design via coin-toss. For dehydration, participants refrained from drinking fluids for 12 hours, and consuming food for 3 hours prior to testing. For hydration, the participants consumed 72 ounces of water during the 12 hours prior to testing. For both phases, moderate intensity physical activity was allowed until 3 hours prior to testing. Before assessing body composition, hydration status was assessed by testing urine specific gravity (USG). Dehydration was set as USG > 1.020 and hydration USG < 1.010. Results: Data will be presented at SSD.

KIRKHOF CENTER GRR 013

U.S. Residential Segregation

Participants attending 4:00 PM - 5:00 PM
Presenter: Taylor Comment
Mentor: Jennifer Stewart

My presentation examines the historical implications of racial inequality and how it has shaped what residential segregation looks like today in the United States. I argue that in order to understand what American neighborhoods look like today, we have to examine the historical patterns of racial domination that have played a hand in creating and maintaining racially segregated neighborhoods. My method includes looking at the historical trends of housing discrimination and finding connections between the racial discrimination of the past and the residential segregation that exists today. This includes looking at federal and state laws allowing discrimination on the basis of race as well as certain methods and policies of real estate agents and city planners. I offer explanations as to why change in terms of residential integration has been slow coming, negative consequences of racially divided neighborhoods and how some of these issues are being addressed on a federal level today.

KIRKHOF CENTER GRR 014

Neoadjuvant Therapy with Anti-telomerase Potentiates the Effects of Anthracycline Based Chemotherapy

Participants attending 1:00 PM - 2:00 PM
Presenter: Luke Pardy
Mentor: Osman Patel

The US has among the highest incidence of breast cancer in the world. Moreover, 20% of all breast cancer cases in the US are of the subtype known to be the most aggressive and invasive form of the disease, called Triple-Negative Breast Cancer (TNBC). Over the decades, interest in pre- (Neoadjuvant) and post-chemotherapy (Adjuvant) treatments, in the management of TNBC has increased. Therefore, we evaluated the adjuvant and neoadjuvant effects of anti-telomerases (BIBR 1532 and GV6) with Doxorubicin. In the neoadjuvant experiment, the TNBC cells were supplemented with anti-telomerases for 14 days, then exposed to Doxorubicin (n=4) for 7 days. In the subsequent experiment, cells were first primed with Doxorubicin for 7 days prior to 14 days of anti-telomerase therapy. After 14 days of BIBR1532 or GV6 pre-treatment the cell densities decreased by 55% ($p<0.05$) and 21% ($p=0.06$), respectively. These data indicate that anti-telomerase neoadjuvant therapy has beneficial effects.

KIRKHOF CENTER GRR 015

The Impact of Perfusion on Stored Blood Vessel Function

Participants attending 11:00 AM - 12:00 PM
Presenters: Bradley Ophoff, Dane Sanders
Mentor: Francis Sylvester

The goal of the experiment is to study the impact of different storage methods for arteries on vascular reactivity. Commonly, blood vessels are refrigerated prior to experimentation. During storage, the blood vessels are maintained in a buffer solution at low temperature and are not perfused with blood. In vivo, blood vessels constrict or dilate in response to various stimuli as a means to control blood flow. We hypothesize that adding a perfusion protocol to traditional blood vessel storage methods will improve subsequent vascular responses. To test this hypothesis, the left anterior descending (LAD) artery was dissected from a porcine heart. Next, segments of the LAD were stored in Krebs buffer solution in the refrigerator, at body temperature, and at body temperature while being perfused; all segments were stored for 30 minutes.

KIRKHOF CENTER GRR 016

The Effect of Hydration Status on Body Composition Analysis in College Age Students

Participants attending 1:00 PM - 2:00 PM
Presenters: Ryan Mostyn, Kathryn Siroonian, Brian Thompson
Mentor: Ross Sherman

Body composition has increasingly been sought after as an accurate measure of risk for heart disease, metabolic syndrome and obesity. The accuracy of body composition tests has been questioned due to factors such as hydration status. Purpose: To investigate the impact of dehydration on assessment of body composition. Methods: 15-20 adults 18 to 25 years of age completed the study. Body composition was measured while participants were hydrated or dehydrated. Dehydration will be achieved by having participants fast for 8 hours prior. A minimum of 48 hours is needed between the trials for each individual. A randomized crossover design was used in this study. Hydration status was determined using a refractometer, classifying hydrated as USG 1.010 and dehydrated as USG 1.020. Results: Will be presented at SSD.

KIRKHOF CENTER GRR 017

The Effect of Dynamic Stretching on Power Generation

Participants attending 11:00 AM - 12:00 PM
Presenters: Erica Hobson, James Morris
Mentor: Ross Sherman

Background: Stretching is performed prior to exercise to avoid injury. However, over-stretching the muscle has a direct and negative effect on the ability to produce power. Dynamic stretching activates neuromuscular recruitment without over-stretching. Purpose: To determine if dynamic stretching has a significant effect on power output. Methods: Ten volunteers participated in this study which used a randomized crossover design. The testing occurred on two different occasions in an indoor facility. The first day, a five minute jogging warm up was performed before three maximal broad jumps. Jump distance was recorded using tape measure at the shortest landing point, the longest jump was used for analysis of power output. Following a minimum of 48 hour recovery, the same five minute jogging warm up was used, but this time a standardized dynamic warm-up using a 47' track/distance was added before repeating the broad jump tests. Results: Data will be presented at SSD.

KIRKHOF CENTER GRR 018

Impact of Pre-Workout on Strength and Muscular Endurance

Participants attending 11:00 AM - 12:00 PM
Presenters: Ronald Fancher, Brian Fawley, Hannah Hamlin
Mentor: Ross Sherman

Background: Caffeine is a CNS stimulant and causes vasoconstriction. The use of caffeine-based pre-workout (PW) has shown to improve 1 RM and muscular endurance for upper body muscle groups compared to lower body muscle groups. Purpose: Identify if caffeine based PW will increase maximal strength and muscular endurance for upper and lower body. Methods: 12 GVSU male students who have previously used PW were assessed using a random crossover design. No more than 200mg of caffeine (i.e. one cup of coffee or a can of soda) should be ingested within 24 hrs of the workout and no caffeine within 4 hrs of the workout. Subjects will randomly receive either PW or placebo one hour before performing 1-RM. Subjects will perform a standardized warm-up and 70% of 1-RM back squat and bench press will be calculated. HR, BP and RPE will be measured pre and post testing. Workouts will take place 48 hrs apart to allow for complete recovery. Results: Data will be presented at SSD.

KIRKHOF CENTER GRR 019

Tracking Muscle Activation and Torso Rotation During Core Stix Resistance Training

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

Presenters: Robert Albert, Erin Brown, Elizabeth Malear, James Morris, Alexandra Shaner
Mentor: Stephen Glass

The term functional training describes a form of resistance training that incorporates free movement through planes of motions, and at varied speeds. Functional training devices include stability balls, Bosu balls, and elastic bands. A newer training device utilizes fiberglass polymer poles that are inserted into metal holes. The training tool, known as Core Stix, can be used with different resistance poles and different hand holds.The manufacturer provides a range of exercises for the user, and suggests these activate core muscles. However, to date no research has established whether any of these movements indeed activate the core muscles as proposed. This presentation will outline proposed methods for a study designed to examine the patterns of muscle activation of the core muscles (abdominal oblique, paraspinal) and shoulder (anterior, posterior deltoid) during a multi-joint “push-pull” exercise using Core Stix training poles.

KIRKHOF CENTER GRR 020

The Economic Factors Influencing Quality of Life in Female Breast Cancer Survivors

Participants attending 3:00 PM - 4:00 PM

Presenter: Charles Benke
Mentor: Julia VanderMolen

Purpose and Background- Breast cancer is the most prevalent cancer diagnosed among women. Due to recent advances in technology the number of breast cancer survivors is rising. Survivors battle the economic and emotional hardships due to extensive treatment. This poster provides evidence that correlates the Quality of Life (QoL) of breast cancer survivors to various economic factors. Methods-This systematic review was completed using studies selected from ProQuest Medical, PubMed, and CINAHL using the keywords: economic factors, breast cancer survivors, women, and QoL. Results- Women who have breast cancer or who have survived have higher out of pocket costs, miss more workdays and have a lower employment rate. This loss of income, on average, lowered QoL scores. Conclusion- This study demonstrated a general decrease in quality of life for female breast cancer survivors which was also strongly correlated to their financial burden.

KIRKHOF CENTER GRR 021

Dialectal Differences Between Mexican and Guatemalan Spanish

Participants attending 10:00 AM - 11:00 AM
Presenter: Sarah Tibble
Mentor: Keith Watts

Spanish as a language has changed drastically from its roots in Spain throughout the centuries. Dr. John Lipski, a renowned Spanish linguist, has done years of research on the differences and similarities in the Spanish spoken around the world. His work formed the basis for this project that was done as part of an independent sociolinguistics research study under Dr. Keith Watts. This study involved the recording and analysis of several speakers from each dialectal group using PRAAT software. The purpose of this study was to focus on comparing Mexican Spanish to Guatemalan Spanish. These two dialects are very different due to these countries' histories as well as the prevalence of indigenous influence today. This project relates to the field of speech-language pathology with regards to the need to create comprehensive assessment and therapy materials for the evaluation and diagnosis of speech and language disorders in bilingual individuals.

KIRKHOF CENTER GRR 022

Memetic Inheritance of Moral Purity

Participants attending 1:00 PM - 2:00 PM
Presenter: Travis Robinson
Mentor: Patrick Thorpe

A review of studies from moral and behavioral psychology was performed to assess whether imitation is a predominant mechanism for the evolution of human behavior and if emotions can influence patterns of inheritance. This study builds on Richard Dawkin's meme theory which argues that when humans imitate other humans, those imitated behaviors may then be treated as self-replicating entities subject to natural selection. This theory was evaluated using heuristic models of human decision making and Johnathan Haidt's Moral Foundation Theory to propose a new explanation for the emphasis of moral purity and avoidance of learned motivators of disgust across human cultures. While this explanation appeared fitting in a post hoc analysis, new experimental procedures are needed to test whether emotional selection of memes can produce more complex moral ideologies.

KIRKHOF CENTER GRR 023

Effectiveness of Post-Exercise Stick Rolling on Delayed Onset Muscle Soreness

Participants attending 9:00 AM - 10:00 AM
Presenters: Clint Douglas, Jeremiah Duckworth, Austin Millner
Mentor: Ross Sherman

Background: Delayed onset muscle soreness (DOMS) usually peaks between 24-48 hours post exercise. Myofascial release has been studied as a technique to reduce DOMS. Purpose: The purpose of this study is to determine the effectiveness of stick rolling on delayed onset muscle soreness. Methods: Eight average healthy individuals participated in this study. The participants refrained from vigorous exercise 24 hours prior to experiment. 18-inch box jumps were performed 10 times for 10 sets with 60 seconds' rest between each set. Once exercises were finished the individuals laid on treatment table and had their right hamstring stick-rolled for 240 seconds following the rhythm of a metronome. The left hamstrings of the participants were used as the control. A digital force gauge and perceptual scale was used to determine soreness of each hamstring immediately 24 and 48 hours post exercise. Results: Data will be presented at SSD.

KIRKHOF CENTER GRR 024

BshB and BshB2: Crystallization and Analysis

Participants attending 4:00 PM - 5:00 PM
Presenter: Joshua Berwanger
Mentor: Paul Cook

BshB & BshB2 are zinc deacetylase enzymes that catalyzes the second step in the biosynthetic pathway that yields bacillithiol, which is used in the redox homeostasis & detoxification of reactive oxidative species in Gram-positive bacteria. Previous studies have proposed functional features of BshB & BshB2, but there is sparse knowledge on how BshB & BshB2 structurally & mechanistically bind & catalyze their substrate. Crystallization trials of BshB & BshB2 were conducted to attempt to elucidate how these enzymes accommodate & catalyze their substrate in the active site. We report partially ligand bound structures of BshB crystals soaked with Glc-N-mal. Bacillithiol has also been shown to be used in the enzymatic deactivation of the antibiotic fosfomycin. Obtaining knowledge on how these enzymes interact with their substrates can lead to the design of novel inhibitors to suppress production of bacillithiol which can in turn lead to designing new drugs to combat fosfomycin resistance.

KIRKHOF CENTER GRR 025

Tlatelolco y Ayotzinapa; buscando conexiones

Participants attending 3:00 PM - 4:00 PM
Presenter: Tina Kneisel
Mentor: Zulema Moret

Tlatelolco y Ayotzinapa; una comparación de eventos trágicos que resultaron del uso de fuerza violenta por parte del estado en contra de sus propios estudiantes

Al asistir a la Conferencia de las Américas el año pasado, me intereso realizar una investigación sobre las tragedias de la masacre de estudiantes en Tlatelolco, México en 1968 y la desaparición/ asesinato de los 43 estudiantes en 2014 en Ayotzinapa, México. Utilizando una variedad de materiales sobre estas tragedias, (Octavio Paz y Elena Poniatowska) artículos y ensayos, investigué las conexiones entre los dos eventos así como el papel de las reacciones resultantes. Existe una relación entre estos dos acontecimientos y razones comunes para que la historia pareciera repetirse. Aunque encontré conexiones y semejanzas significativas, las razones de las tragedias quedaban menos claras. Lo indudable sin embargo, es la importancia de recordar, reflexionar y estudiar estos tristes acontecimientos de la historia mexicana.

KIRKHOF CENTER GRR 026

Is There a Sex Difference in Setting "Guinness-Style" World Records? A Test of the Male Show-Off Hypothesis

Participants attending 11:00 AM - 12:00 PM
Presenters: Megan Eilar, Errin Fornicola, Timothy Siciliano
Mentor: Robert Deaner

Throughout history, men have dominated expressive cultural domains such as athletics, painting, music, and literature. One explanation is that women have been excluded from participating. Although exclusion must be important, evolutionists suggest that male dominance can be partly understood as a manifestation of male adaptations to ‘‘show off’’ and demonstrate their talents compared to those of other men. If men are more predisposed to "show off," we should find evidence of greater male effort even in domains where women have equal opportunities. We tested this prediction by quantifying "Guinness style" world records set by men and women at RecordSetter, where individuals define their own records and provide video evidence of setting them. There are no external rewards for setting records, or barriers (e.g. fees) to setting them. Of the 500 records we have coded so far, 80% were set by men. We will discuss alternative explanations for this result and its significance.

KIRKHOF CENTER GRR 027

Development and Verification of Medium-Throughput Screening of Inhibitors to BshA, the First Enzyme in Bacillithiol Synthesis

Participants attending 1:00 PM - 2:00 PM
Presenter: Kelsey Winchell
Mentor: Paul Cook

Antibiotic resistance is a pressing issue in the world today. By understanding mechanisms of resistance and the compounds involved, the enzymes can be targeted with inhibitory compounds to the end result of restored antibiotic sensitivity. The enzyme BshA is used by many Gram positive bacteria in bacillithiol synthesis in a method of antibacterial resistance to fosfomycin. A total structural and mechanistic understanding of BshA is necessary for the design and search for inhibitors for this enzyme, as well as the utilization of efficient screening tools to identify inhibitors. Using X-ray crystallographic structures of BshA, a molecular docking program has been used to identify potential inhibitors for this enzyme crucial to bacillithiol production. To effectively screen any reasonable hits from this program in the future, a time-conscious assay using a plate reader has been developed and characterized that may be used to test the efficacy of the identified potential inhibitors.

KIRKHOF CENTER GRR 028

Behavioral Thermoregulation During Winter in Japanese Macaques (*Macaca fuscata*)

Participants attending 10:00 AM - 11:00 AM
Presenter: Brianna Powell
Mentor: Cynthia Thompson

Mammals use thermoregulatory behaviors to maintain optimal body temperatures in fluctuating weather. During cold temperatures, these behaviors can serve as an energetically inexpensive way to modulate heat loss. We assessed the use of thermoregulatory behaviors in a semi free-ranging group of Japanese macaques (*Macaca fuscata*) in Japan during winter. We recorded activity, body postures, and sun exposure for five animals (N=443 observation hrs) exposed to natural thermal variation (-2.9°C to 10.8°C). Air temperature and solar radiation were recorded via on-site weather station. At colder temperatures, macaques utilized heat-conserving body postures more frequently, engaged in longer periods of physical contact, spent less time moving, and rested in sunny locations more frequently than shady locations. In sum, these results indicate that Japanese macaques utilize heat- and energy-conserving behaviors as part of their thermoregulatory repertoire when experiencing cold temperatures.

KIRKHOF CENTER GRR 029

Diabetes Management within Camps

Participants attending 9:00 AM - 10:00 AM
Presenters: Rachel Fischer, Stephanie Gibson, Taylor VanVeldhuisen
Mentor: Julia VanderMolen

The objective of this systematic review is to evaluate the control of type 1 diabetes, focusing on diabetes camps, education, and self-management in adolescents. Through our research we appreciate the effectiveness of diabetes camps and are currently pursuing the idea of having a diabetes management and nutrition camp in the Grand Rapids area. Of 1,930 titles identified in our original search, 15 articles met inclusion criteria for the systematic review. Key findings attained within the articles include increased efficacy, coping mechanisms, and a safe environment in which to practice taking next steps to manage type 1 diabetes. Through education and experience obtained in diabetes camps, there is potential to improve self-management in adolescents with type 1 diabetes. The degree of knowledge parents, teachers, and camp counselors have regarding diabetes greatly influences the quality of self-efficacy adolescents with type 1 diabetes can attain.

KIRKHOF CENTER GRR 030

Comparative Values of Post-Concussive Assessments, to Baseline Data vs. Normative Data, and the Effects of a Valid Baseline Assessment.

Participants attending 2:00 PM - 3:00 PM
Presenter: Hannah Gray
Mentor: Brian Hatzel

Background: The objective of this study is to determine the sensitivity and validity of normative paradigms when comparing against post-concussive data, in the absence of baseline data. Methods: A boolean search from databases including PubMed, Sportdiscus, EbHost, and Web of Science were used to retrieve information. Twelve articles were chosen for this project. Results: Normative data vs baseline data when compared to post-concussive data showed normative data as having 72% sensitivity while baseline data concluded a 94% sensitivity rating. Out of 75 participants, 11% were successfully able to “sandbag” a neurocognitive test without reaching the threshold and setting off red flags. Conclusion: Normative data can be used to manage impaired athletes when comparing to post-concussive data, but this is not the most effective method. Although purposely performing poorly on a baseline assessment without setting off “red flags” is difficult, it is not impossible.

KIRKHOF CENTER GRR 031

What Causes the Reversal of the Mental Timeline?

Participants attending 3:00 PM - 4:00 PM
Presenter: Joshua Guiles
Mentor: Kevin Autry

Research on the perception of time has revealed that people represent time using spatial information (e.g., past = left, future = right). The specific direction of the mental timeline appears to be caused by reading direction, with reversed reading direction inducing a reversed mental timeline. Two experiments were conducted to determine the cause of this reversal. Experiment 1 examined whether right-to-left eye movements, independent of language, could account for the reversed mental timeline. The results demonstrated a consistent left-to-right timeline regardless of whether subjects were primed with leftward or rightward eye movements, suggesting that eye movements do not explain the reversal. Experiment 2 is currently examining whether reversed reading direction, independent of eye movements, can account for the reversed mental timeline. This research has implications for the perception of time as well as the more general issue of mental representation of abstract concepts.

KIRKHOF CENTER GRR 032

Design and Development of Novel Organic Pseudocapacitors

Participants attending 11:00 AM - 12:00 PM
Presenter: Aaron Hillsamer
Mentor: Andrew Lantz

Pseudocapacitors store electrical energy faradaically, meaning that they use redox processes to convert electrical energy to chemical energy by transferring charge from an electrode to an electrolyte within the capacitor. Electrochemical capacitors have potential to be valuable energy storage devices, replacing batteries in some applications that benefit from fast charge/discharge cycles and long-term reliability. Capacitors were built in the lab using platinum button cells and graphite electrodes coated with carbon fiber paste. The capacitance of the cells was tested using cyclic voltammetry and electrochemical impedance spectroscopy. Capacitors with and without a redox-active compound were tested to compare its impact on capacitance. In order to maximize capacitance and conductivity, various supporting electrolytes were also examined.

KIRKHOF CENTER GRR 033

Comparison of the Tongue Blade Test to Ultrasound in Identifying Mandibular Fracture

Participants attending 1:00 PM - 2:00 PM
Presenter: Tyler Schwartz
Mentor: Brian Hatzel

Background: Athletic Trainers often use the Tongue Blade Test (TBT) to identify the presence of mandibular Fx. Similarly, Ultrasonography (US) has been used in clinical environments for diagnosis of this condition. Objectives: To determine if TBT or US has greater diagnostic capabilities in identifying the presence or absence of a mandibular Fx. Data sources: Science Direct and PubMed. Results: TBT sensitivity and specificity had a range of 95-100% and 64-74.8% respectively. While US sensitivity and specificity had a range of 66-97.4% and 52-100% respectively. Limitations: TBT was only able to determine one Fx. per side. Conclusions: US had a wider range of sensitivity and specificity, showing that the TBT was more consistent. Implications: In the clinical setting to work on eliminating the high volume of patients sent for CT scans.

KIRKHOF CENTER GRR 034

Modeling the HIV Virus Infection

Participants attending 10:00 AM - 11:00 AM
Presenter: Katie Kruk
Mentor: Benjamin Holder

HIV is a virus that affects the immune system by destroying CD4+ T cells, white blood cells that help fight infection. Currently, antiretroviral drugs exist to halt the proliferation of the HIV virus, though they fail to cure a person from HIV due to the natural development of a population of latently infected cells that hold the virus' genome. The specifics of how a population of cells reaches an HIV-latent state are currently not known, though this is a crucial component of the infection to understand in order for a cure to be developed. In 2015, Dr. Anding Shen at Calvin College, performed experiments infecting different cell cultures *in vitro*: resting CD4+ T cells, activated CD4+ T cells, and resting CD4+ T cells in co-culture with endothelial cells. Using the collected data by Dr. Shen, we developed a mathematical model (a system of ordinary differential equations) to simulate infections that coincide with experimental conditions, and we fit parameters to best match the data.

KIRKHOF CENTER GRR 035

Love and Desire in Sappho's Fragment 31: A Translation

Participants attending 9:00 AM - 10:00 AM
Presenter: Allie Pohler
Mentor: Diane Rayor

Though most of her poetry has been lost and now exists only in fragments, Sappho, the female Greek lyric poet of Lesbos, continues to be an immensely important poet. Her works were greatly admired in her own time and continue to be a prominent influence on poetry. This semester, my research focuses on cataloging and analyzing modern translations, versions, adaptations, and uses of Sappho, from 1901 to 2016. Sappho's most popularly translated fragment, Fragment 31, provides an illuminating example of the subtle variations which occur in translating Greek poetry. My analysis of Sappho's Fragment 31 in the original Greek and in multiple translations from the 20th century, has led to my own translation and commentary. Additionally, my research will aid in the composition of Dr. Rayor's chapter "Sappho in the Twentieth Century and Beyond" for the *Cambridge Companion to Sappho*.

KIRKHOF CENTER GRR 036

Tissue Damage Evoked by Subacromial Bursitis

Participants attending 10:00 AM - 11:00 AM
Presenter: Brooke Southerland
Mentors: Cara Ocobock, Timothy Strickler, Laura Stroik, Cynthia Thompson

Experts estimate that roughly 66.7% of individuals will encounter shoulder pain at some point during their lifetime. Subacromial bursitis is a condition characterized by the irritation and inflammation of the subacromial-subdeltoid bursa located on the glenohumeral joint. Synovial bursae are thin, viscious fluid-filled sacs lined with a synovial membrane that encompass the exterior of a joint to alleviate potential friction from movement. When tissue damage occurs, both an expansion in the size of the bursa as well as an increase in the amount of synovial fluid within the sac have been documented. The dissection of a 102 year-old female cadaver revealed severe tissue damage and inflammation of the subacromial-subdelotid bursa of her right shoulder. This project discusses the potential underlying causes of this condition as well as whether the observed tissue damage is typical given the extent of the injury.

KIRKHOF CENTER GRR 037

Chiral Separation of Silanes *via* Capillary Micellar Electrokinetic Chromatography

Participants attending 2:00 PM - 3:00 PM
Presenter: Connor Radecki
Mentor: Andrew Lantz

Chiral silanes have become very important in the field of chemistry due to their use in stereoselective synthesis and organometallic chemistry. Silanes are also of particular interest in the pharmaceutical industry due to their potential drug delivery abilities. Because silanes can react differently based on their enantiomeric or diastereomeric ratio, separating and quantifying these compounds is important. Typically, chiral separations are performed *via* HPLC using cellulose-based columns, however the limited flexibility of this method prevents it from separating some chiral silanes. Here, we develop a method to separate novel chiral silanes using chiral micellar electrokinetic chromatography. Using sodium deoxycholate as a chiral selector in a TRIS/methanol buffer, successful separations were acheived for two different chiral silanes, (menthoxy)(methyl)(napthyl)phenylsilane and (butyl)(menthoxy)(methyl)phenylsilane, with separation resolutions of 1.93 and 1.96 respectively.

KIRKHOF CENTER GRR 038

The Acute Effects of Dynamic Stretching and Proprioceptive Neuromuscular Facilitation on Muscular Endurance Performance During the Leg Press

Participants attending 10:00 AM - 11:00 AM
Presenters: Mackenzie Boyer, Sarah Ivan, Travis Tollefson
Mentor: Justin De Sousa

The purpose of this study was to examine the acute effects of dynamic stretching and proprioceptive neuromuscular facilitation on muscular endurance performance during the leg press. Five inherently healthy and recreationally active college students (age: 21 +/- 1.10 years; height: 169.8 +/-8.47 cm; weight: 72.1 +/- 7.64 kg) participated in this study. Participants completed two different experimental conditions in a counter-balanced order. Each participant performed the leg press to maximal repetitions at 65% of their one-repetition maximum following each condition: after dynamic stretching (DYN) and after proprioceptive neuromuscular facilitation (PNF). There were no significant differences in the total amount of repetitions completed between the two conditions (DYN: 50.2 ± 8.01 and PNF 50.4 ± 5.68). These findings suggest that PNF or dynamic stretching can be used prior to muscular endurance activities.

KIRKHOF CENTER GRR 039

Synthesis and Comparison of p130cas Peptide Sequences For Potential Effective FAK Substrates and Inhibitors

Participants attending 12:00 PM - 1:00 PM
Presenter: Jennifer Jess
Mentor: Laurie Witucki

It is estimated that 292,130 women in the United States will be diagnosed with breast cancer this year, making it one of the most common cancers among women. Focal Adhesion Kinase (FAK), a cytoplasmic tyrosine kinase known to play a role is cell migration, is up regulated in 14 of 18 invasive breast carcinomas. This research aims to better understand FAK selectivity and to find successful methods for controlling FAK expression by synthesizing a section of the protein p130cas using solid phase peptide synthesis. Previous research showed LS-1, a small sequence of the p130cas protein, to be an excellent substrate for FAK. New sequences were designed and synthesized based on this lead peptide. These novel compounds incorporated alterations to tyrosine residues, in order to create effective FAK inhibitors. Testing of both inhibitors and substrates via radioisotope assays and activity comparisons to previously synthesized compounds will allow us to find the best possible substrate for FAK.

KIRKHOF CENTER GRR 040

Neuropharmocological Alterations of the Aggressive Behavior of Crayfish

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenter: Kristi Ruvina
Mentor: Daniel Bergman

Serotonergic-related compounds often facilitate aggression in various animals, including crayfish. However to date, studies have seldom shown the mechanism by which serotonergic-related compounds alter aggressive behavior. It is assumed that serotonin changes the neurochemistry of those injected. In our study, we have attempted to report an observable mechanism by examining the communication system of crayfish. Crayfish use urine to communicate aggressive status, thus we analyzed the frequency of urine release from those injected with serotonergic-related compounds. For each trial, two size-matched crayfish, within 5% body weight, were allowed to interact after injection with serotonin, an agonist, an antagonist, or vehicle control. The concentration of all drugs was 3mM at a delivery dosage of 0.1ml/g. Aggressive interactions were recorded under black light to illuminate a fluorescein dye that was added to all injections. Urine release and aggressive behaviors were then analyzed.

KIRKHOF CENTER GRR 041

Causation of the Cyclic Deposition Observed in the Fairview Formation (Upper Ordovician) in Northern Kentucky

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 12:00 PM - 1:00 PM
Presenters: Jeffrey Gwasdacus, Sean Hiles, Jonathan Parker, Alexander Rarick
Mentor: Peter Riemersma

The Fairview Formation, located in Maysville, Kentucky, is an astounding and prime example of alternating or cyclic fossiliferous limestone and shale sediment layers. By examining previously collected samples from the Fairview Formation, we will work to identify the driving forces behind the cyclic nature of these layers. Mechanisms proposed to explain the cyclicity of the fossil rich limestone beds include mud winnowing, changes in the sediment supply and storm events, possibly coupled with changes in sea level. In order to distinguish between these explanations, we will assess the frequency and thickness of the layers from stratigraphic columns and examine fossils and the nature of the sediments (i.e. grain size, shape etc.) in our hand samples and thin sections.

KIRKHOF CENTER GRR 042

It's Not That Easy Being Green - Hotels in Grand Rapids

Participants attending 9:00 AM - 10:00 AM
Presenter: Erika Williams
Mentor: Michael Scantlebury

This paper looks at the hotel industry in Grand Rapids (GR), focusing on whether 57 properties are ecofriendly and green. The emergence of the Green Movement has led to increased awareness and consciousness for people to take greater care of the earth by going green. There are several definitions regarding the meaning of being green. I will explore these definitions more thoroughly to uncover a cohesive meaning that will examine the multiple layers of the green movement. Various organizations offer certifications within their groups to distinguish different levels of being green. How valid and applicable are these certifications to the Grand Rapids hotels? By focusing on GR hotels I will examine the certifications that they use to support their claims of being ecofriendly. In addition, this research will conclude with an assessment of what the future might involve for the green movement and how improving conditions within a hotel could potentially impact the environment.

KIRKHOF CENTER GRR 043

Draining and Re-Flooding of the Mesopotamian Marshes: 1985-2015

Participants attending 9:00 AM - 10:00 AM
Presenters: Kristen Childs, Kray Freestone
Mentor: Wanxiao Sun

This project seeks to identify changes in land cover of the Mesopotamian Marshes in Iraq based on two events: the draining of the marshes during the 1990s and their subsequent re-flooding in the early 2000s. Former Iraqi leader Saddam Hussein's order to drain the marshes has had a drastic effect upon the lives of local Marsh Arab people and the ecology of the region. This project compares four Landsat images of the marshes recorded between the years 1985-2015. The comparison is based on the results of supervised classification of each image to determine the areas occupied by five distinct classes: water, marshland, dried marshland, barren land, and agriculture/light vegetation. Results indicate that re-flooding efforts have been unable to restore the marshes to their previous state, as the marshland vegetation land cover measured in 2015 represented only one-third of the total land area which was occupied by marsh vegetation in 1985.

KIRKHOF CENTER GRR 044

Upper Ordovician Kope Formation, Northern Kentucky: Is Cyclicity Caused by Storm Events or Sediment Supply Variance?

Participants attending 10:00 AM - 11:00 AM
Presenters: Conner Frymier, Ricky Kloe, Charles Moon, Timothy Suess
Mentor: Peter Riemersma

In northern Kentucky spectacular outcrops of the Kope Formation expose cycles of fossiliferous limestone that alternate with thicker intervals of fine-grained shale. Past studies interpret the fossil rich beds to be deposited and influenced by storm events, but more recent studies propose variations in sediment supply as the cause of the cyclicity. Storm events are interpreted to cause the cyclicity by reworking sediment and depositing the fossil rich beds. Sediment variation is interpreted to cause cyclicity by accumulating the fossil rich beds during low sedimentation rates; during high sedimentation rates the fine grained shale beds were deposited. The existence of mud with shell material seems to preclude formation by storm winnowing. We examine thin sections and hand samples of limestone beds to characterize the shell content and weathering, mud distribution and sedimentary structures to help differentiate between the two mechanisms.

KIRKHOF CENTER GRR 045

Transient Effects of a Single Bout of Low Intensity Exercise on Postprandial Lipemia and Glycemia

Participants attending 9:00 AM - 10:00 AM
Presenters: Thomas Braganca, Thomas Mardeusz, Elena Ongaro
Mentor: Ross Sherman

Dysfunction of fatty acid metabolism is correlated with increased incidence of cardiovascular disease, whereas chronic exercise has been proven to reduce postprandial hyperlipidemia. Aim: To determine the effect of a single bout of low intensity exercise on postprandial lipemia and glycemia. Methods: Eight healthy college-aged participants completed a low intensity exercise bout and 12 h fast followed by consumption of a high fat meal. Allocation to exercise (45 min walking at 3.5 mph and 7% incline) or rest followed a randomized crossover design. Blood samples were taken pre-meal and 1, 2, and 3 h into the postprandial state. Results: A significant ($p<0.01$) increase in blood glucose was seen over time, a trend towards a significant ($p=0.06$) change in total cholesterol was observed with exercise, as well as a non-signifcant ($p>0.05$) reduction in triglyceride with exercise. Conclusion: A single bout of low intensity exercise was ineffective in altering postprandial lipemia or glycemia.

KIRKHOF CENTER GRR 046

Recovery and Recycling of Lanthanides and Actinides in Spent Nuclear Fuel for Sustainment of Nuclear Reactors

Participants attending 2:00 PM - 3:00 PM
Presenter: Michael Hudson
Mentor: Shannon Biros

The goal of this proposal is to develop a new method for the recovery of lanthanides and actinides from spent nuclear fuel. A new organic compound will be prepared over the course of this project, and it will be tested for its ability to recover Th-232 and Pu-238 from acidic water (to mimic the conditions of spent nuclear fuel). We predict that an increase in the percent extraction of Th-232 and Pu-238 will be demonstrated in our experiment. At GVSU, thorium 232 (Th-232) will be used as safe model for Pu-238 in our experiments. Our collaborator at Lawrence Berkeley National Laboratories (LBNL) will carry out the experiments with Pu-238. Improved methods for the recovery of Pu-238 could lead to its reuse as a nuclear energy source in nuclear reactors.

KIRKHOF CENTER GRR 047

Investigations of Scrotal Oedema

Participants attending 9:00 AM - 10:00 AM
Presenter: Danielle Davis
Mentors: Cara Ocobock, Timothy Strickler, Laura Stroik, Cynthia Thompson

Acute presentation of painless swelling in the scrotum (scrotal oedema) is a condition common in young boys but rare in adults. Scrotal oedema might occur as a symptom of diseases that present generalised oedema. The dissection of a 94 year old male revealed the presence of an abnormally enlarged scrotum. Palpation indicated the presentation of scrotal oedema. Using basic dissection, the scrotum will be dissected in order to view the internal structures, including the testicles, and further investigate the cause of the swelling. The swollen state of the scrotum is possibly related to other preexisting conditions in the body, such as chronic obstructive pulmonary disease (COPD) and congestive heart failure. COPD can lead to further complications, including cor pulmonale, causing right sided heart failure and subsequent edema of the lower extremities. The scrotal oedema could represent the presence of more serious conditions in COPD patients.

KIRKHOF CENTER GRR 048

Stage IV Breast Cancer in Women

Participants attending 9:00 AM - 10:00 AM
Presenter: Travis Garvin
Mentors: Cara Ocobock, Timothy Strickler, Laura Stroik, Cynthia Thompson

Breast cancer is the second most common cancer diagnosed in women and one of every eight women born today will receive a breast diagnosis at some point in their life, an increase from the 1970's at one of eleven. As with any cancer, early detection of the disease increases the likelihood of successful treatment, thus survivability. About 79% of new diagnoses and 88% of deaths due to breast cancer occur in women over the age of 50. Studies have shown no significant difference between survival of bilateral and unilateral breast cancer patients. The full dissection of a cadaver aged 68 with the cause of death as stage IV, terminal end cancer, with the appearance of unilateral tumorigenic properties will help reveal the gross pathology of the disease and the pattern of metastasis throughout the body.

KIRKHOF CENTER GRR 049

A Scientific Report on Sorghum Yields in Sub-Saharan Africa over the Next Fifty Years under the Effects of Climate Change

Participants attending 10:00 AM - 11:00 AM
Presenter: Angela Michael
Mentor: Elena Lioubimtseva

Sub-Saharan Africa has had documented climate change over the past 150,000-years. Currently, greenhouse gas emissions are at an all-time high, with effects on the climate beginning to unfold. We are interested in pursuing the effects of climate change on Sub-Saharan Africa and sorghum, one of the region's staple crops. We will be utilizing MAGICC/SCENGEN 5.3 climate modeling software, precipitation and temperature data, sorghum planting information, and interviews with climate change scientists to document changes in sorghum yields over the next 50-years. Our results will be used to aid agricultural management strategists and climate change scientists.

KIRKHOF CENTER GRR 050

Fluorescence Analysis of BshC Ligand Binding Interaction

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenter: Aaron Rosenberg
Mentor: Paul Cook

Bacillithiol is a compound found in Gram positive bacteria that is responsible for redox homeostasis and detoxification of reactive oxygen species. BshC is a cysteine ligase in the putative three enzyme bacillithiol biosynthesis pathway. While BshA and BshB enzymatic functions have been observed through *in vitro* assays, BshC has not. BshC has been expressed and purified from a number of new orthologs including *Bacillus cereus* and *Staphylococcus saprophyticus*. HPLC functional analysis of BshC activity from all orthologs yielded negative results implying that BshC was not active *in vitro*. The intrinsic tryptophan fluorescence binding assays yielded results that implicate that BshC does bind ATP and citrate, but does not bind GTP. Through the use of intrinsic tryptophan fluorescence binding assays and HPLC activity analysis, we hope to advance our understanding of BshC function in bacillithiol synthesis in an effort to combat fosfomycin resistant bacteria.

KIRKHOF CENTER GRR 051

Detecting Single Platinum Nanoparticles Using Ultramicroelectrodes and Investigations of Modified Electrode Surfaces by Cyclic Voltammetry

Participants attending 2:00 PM - 3:00 PM
Presenter: Christopher Peruzzi
Mentor: Scott Thorgaard

Understanding catalysis occurring at metal nanoparticles is critical for making use of these materials in applications such as energy devices and chemical sensors. The goal of this research project is to improve understanding of catalysis at metal nanoparticles using experiments where individual nanoparticles are captured and characterized in an electrochemical cell. Single platinum nanoparticles were detected in our experiments by their ability to catalyze the oxidation of hydrazine as they collide with and stick to a micron-sized inert electrode. The individual particle adsorption events are recognized by transients in plots of the electrode current vs. time, which can reveal their size and reactivity. As possible platforms for single nanoparticle detection, we also investigated procedures for forming thiol self-assembled monolayers (SAMs) on Au electrodes as well as copper electrodeposition processes at multiple electrode materials.

KIRKHOF CENTER GRR 052

Protein Crystallography: Solving the Molecular Structure of Hen Egg White Lysozyme (HEW) using Single Crystal X-Ray Diffraction Techniques

Participants attending 12:00 PM - 1:00 PM
Presenter: Ian Mohr
Mentor: Ross Reynolds

This project will focus on the fundamentals of protein crystallography by means of X-ray diffraction techniques. We will closely examine hen egg white (HEW) lysozyme to determine its crystal structure, first done by David Chilton Philips in 1965. Single crystal X-ray analysis reveals interesting information through interference and diffraction; and by making use of the Collaborative Computational Project No. 4 (CCP4) suite for data processing and structure solution, one can create a three dimensional electron density map to determine an unknown molecular structure.

KIRKHOF CENTER GRR 053

Processes to be Implemented in Long Term Care to Improve the Quality of Life for Elderly Patients: A Systematic Review

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM
Presenters: Anna Banister, Victoria Katerberg, Matthew Reahm
Mentor: Julia VanderMolen

The lack of high-quality long-term care for the elderly is not only a problem within the United States, it is also not a priority of our society. This poster highlights the prominent processes that can be implemented in long-term care situations for the betterment of the elderly population. The researchers used peer-reviewed journal articles throughout the writing of a systematic review. Articles were selected from three scholarly databases: ProQuest Medical, CINHAL Complete, and PubMed. The prominent issues discussed include financial hardships, understaffing, and emotional and mental instability. Possible interventions described in the review include assigning a comprehensive care manager, altering certain governmental policies, and choosing the right type of care setting, among others. It was concluded that more research must be done and that the staff of long-term care facilities would have to truly invest their energies into the new systems for them to be beneficial.

KIRKHOF CENTER GRR 054

Electrochemical Monitoring and Correlated Fluorescence Imaging of Single Escherichia Coli Using Ultramicroelectrodes

Participants attending 10:00 AM - 11:00 AM
Presenter: Austin Ronspees
Mentor: Scott Thorgaard

In this work we report the electrochemical detection of single Escherichia coli bacteria at a Pt disk ultramicroelectrode (UME), with correlated optical observation using a fluorescence microscope. An electric field generated by the oxidation of ferrocene methanol (FcMeOH) at the UME causes the bacteria to arrive at the electrode surface by electrophoretic migration. Adsorption of the bacteria to the electrode surface causes measurable blocking of FcMeOH diffusion to the electrode, which results in quantifiable step shaped transients in a plot of the electrode current versus time. The incorporation of fluorescence microscopy to the method allows us to visually track the migration of fluorescently dyed bacteria as they arrive at the electrode surface. Supplemental experiments monitoring the adsorption of single polymer nanoparticles will also be discussed.

KIRKHOF CENTER GRR 055

Examining the Link between Sense of Control, Social Exclusion, and Physical Vulnerability

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenters: Ashley Rapp, Audrey Tarbutton, Grace Wentworth
Mentor: Kristy Dean

A number of theoretical and empirical studies have shown a link between social vulnerability and physical pain (DeWall, MacDonald, Webster, et al., 2010). Recent research in our lab suggests that social exclusion can also increase perceptions of physical vulnerability (Dean & LeCompte, 2015). Expanding upon this research, the current experiment manipulated social connection (acceptance vs. exclusion) and feelings of control to examine variations in perceptions of physical vulnerability. We hypothesized that social exclusion would increase perceptions of physical vulnerability, but only when one's sense of control was diminished (vs. restored).

KIRKHOF CENTER GRR 056

Changes in Arctic Vegetation: Using GIS to Visualize Change Across a Diverse Landscape

Participants attending 11:00 AM - 12:00 PM
Presenter: Jacob Rumschlag
Mentor: Robert Hollister

Changes in abiotic factors, including climate and weather, influence arctic vegetation growth and distribution. Because arctic regions are particularly susceptible to climate change and warming, plants in these areas are likely to experience changes in growth patterns, which have outreaching consequences and impact the entire ecosystem. In this study, vegetation was sampled and abiotic data was recorded in the years 2010 and 2013 in Barrow, Alaska so as to deeply understand the influence of annual differences in weather. Sampling was done by identifying and recording plant species using a point frame method on 98 1-m^2 plots. Plant frequencies and abiotic data were then distributed spatially in GIS using the latitude and longitude coordinates of each plot. The change in spatial distributions of each plant species between the two studied years was then compared. Results show differences in vegetation frequency and distribution, presumably due to variances in weather.

KIRKHOF CENTER GRR 057

Bone Landmarks and Muscle Mass Associations in Non-Human Primates

Participants attending 2:00 PM - 3:00 PM
Presenters: Brandi Fleming, Haley Schaner
Mentor: Melissa Tallman

The main purpose of this project is to show how bone structure is correlated with muscle mass in non-human primates. Data was collected by the dissection of various species of non-human primates. During dissection, the mass, length, and fiber length of each muscle were recorded. The remains of the bones were boiled, tissue was removed, and the cleaned bones were laser surface scanned. These scans were then analyzed using bony landmarks and other distinguishing features. The bone features were compared to the mass of the muscles that articulate with the corresponding bone. The goal is to see a correlation between larger bone landmarks and larger muscles which will theoretically exert movement with a greater force.

KIRKHOF CENTER GRR 058

Cranial Injury Differences between Males and Females in Roman Britain

Participants attending 12:00 PM - 1:00 PM
Presenter: Kara Larson
Mentor: Gwyn Madden

The Museum of London's Roman West and Roman South databases provided the information needed to determine if there was a difference between male and female cranial injury locations, in Roman Britain. It was hypothesized that males would have a higher number of frontal injuries, due to likelihood of engaging in frontal attacks, and females would have a higher number of occipital injuries, due to the higher frequency of being targeted for violent attacks from the back. The cranial injury samples were divided into three injury categories: front, back, and side, and were sectioned out by sex. The results proved that males did have a higher number of frontal cranial injuries. Females also had a higher number of frontal injuries, as opposed to occipital injuries. These findings could open a doorway into more questions about the male and female dynamic and interpersonal violence within Roman Britain society.

KIRKHOF CENTER GRR 059

Abnormal Bilateral Muscle In Anterior Compartment of Forearm

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 4:00 PM - 5:00 PM
Presenters: Casey Miller, Ian Morrison
Mentors: Cara Ocobock, Timothy Strickler, Laura Stroik, Cynthia Thompson

Muscular variations in the flexor compartment of the forearm are common, and at times, may result in multiple clinical conditions during life. Documentation of common muscle variations in the hand and forearm may be useful to surgeons, as extraneous muscles of this type frequently cause compressive neuropathies. During a group dissection of the anterior portion of the forearm and hand in an 89-year-old male cadaver, an accessory muscle was observed bilaterally. The anomalous muscle belly arose from the antebrachial fascia on the radial side, superficial to the flexor muscles, and in the same plane of dissection as palmaris longus. It crossed the carpal region of the wrist and fused with the muscle fibers of abductor digiti minimi. This study investigates the muscle's similarities and differences with other common flexor compartment anomalies, and its relevance to nerve compression in the hand.

KIRKHOF CENTER GRR 060

Target Inquiry: Changing the Way Teachers Think About Science Instruction in Their Classrooms

Participants attending 9:00 AM - 10:00 AM
Presenters: Roxana Dumitrache, Stephanie Tanis
Mentor: Deborah Herrington

The Target Inquiry (TI) program is a research-based, 2.5-year professional development program for middle and high school science teachers aimed at improving teachers' understanding and use of inquiry-based instruction by changing the way teachers think about teaching and learning of science. Changes in teachers' ideas about inquiry-based instruction as they progress through the program have been captured using the Inquiry Teaching Beliefs (ITB) instrument and analyzing accompanying teacher interviews. Data analysis suggests an understanding of important elements of inquiry-based instruction alone is not enough to support reformed instructional practices, and that throughout the TI program teachers progress from a theoretical model to a personal model of inquiry-based instruction. This poster will examine teachers' ITB data over three years, spanning from pre to post TI program, and highlight important implications for teacher professional development.

KIRKHOF CENTER GRR 061

Construction of a Vector to Transfect Mouse and Human Embryonic Stem Cells with Modified Versions of the Nato3 Gene

Participants attending 1:00 PM - 2:00 PM
Presenter: Dayne Martinez
Mentor: Merritt Taylor

Our lab uses the developing chick embryo as a model system to investigate the function of Nato3, a transcription factor sufficient for driving the expression of midbrain floorplate markers. Ongoing experiments suggest that mutation of Nato3 can modify this action. We have generated and tested multiple mutants of Nato3 to investigate this possibility. The goal of this project was to modify a pMiniTol vector that will be used to transfect P19 cells and human embryonic stem cells with wild type and modified versions of Nato3. A cost-effective site-directed mutagenesis protocol was designed to introduce EcoRI and XbaI restriction sites into the pMiniTol vector so that the Nato3 gene could be inserted. Ultimately, we are interested in the possibility of using Nato3 as a genetic tool to generate floor plate cells that in turn can develop into dopamine neurons more efficiently from progenitor cells for applications such as drug development and cell therapy for Parkinson's disease.

KIRKHOF CENTER GRR 062

Town vs. Gown: The Development of the University of Paris

Participants attending 3:00 PM - 4:00 PM
Presenter: Amber Barber
Mentor: Alice Chapman

Originally founded in the twelfth century and officially recognized in the thirteenth century, the University of Paris was one of the first universities in Europe and it developed into a world renowned center of learning. My research has shown that the University of Paris developed in part due to longstanding conflicts between the townsmen of the city and the scholars of the university. Often under threat from local citizens, scholars sought and were given support from kings, emperors, and popes. With the various decrees from these leaders the scholars were given a variety of special privileges, which gave them increased protection from the townsmen. In the early thirteenth century, the ongoing conflicts between the townsmen and the scholars caused the masters to leave the University of Paris for a period of time, which led to the growth of other famous universities throughout Europe.

KIRKHOF CENTER GRR 063

Using Big Data Mining and Visualization to Understand Human Geo-Spatial Mobility

Participants attending 9:00 AM - 10:00 AM
Presenters: Bishal Chamling, Matthew Lukas, Morgan Oneka, Adam Terwilliger
Mentors: Jonathan Leidig, Gregory Wolffe

Using billions of anonymized mobile phone records, Big Data mining and visualization techniques were employed to better understand human behavior and mobility patterns. When West Africa experienced the largest Ebola outbreak in history, accurate activity models were constructed from this data and used to simulate the transmission of Ebola. Visualizations led to insights such as event detection (e.g. holiday travel). Further work is focused on representing personal behavior via abstract movement patterns (AMP), a mapping from specific cell tower locations to a general behavior (e.g. home to work to drugstore to home). Models based on abstract movement patterns can be used to predict a user's home location, identify regional differences in mobility, or cluster similar users. These fine-grained models can benefit disciplines as diverse as anthropology, epidemiology, tourism, and transportation; wherever location-based knowledge can help illuminate or predict human behavior.

KIRKHOF CENTER GRR 064

Fashion and Femininity: A Feminist Qualitative Analysis of the Shaping of a "Vogue Woman"

Participants attending 1:00 PM - 2:00 PM
Presenters: Jordan Chrispell, Alexa Girouard
Mentor: Ayana Weekley

For this research study we analyzed Teen Vogue and Vogue covers from February-May and August-November issues in 2004 and 2005. We analyzed both the text and the cover images of the issues. For this study, we are using a feminist qualitative analysis. Our project asks the following questions: How do Vogue and Teen Vogue define femininity? How do Vogue and Teen Vogue visualize the ideal woman? What sort of characteristics does this ideal woman have? We predict their ideal picture of femininity would entail having a thin body type, being very vain, finding the perfect man, while also depicting the women on the covers in an overly-sexualized manner.

KIRKHOF CENTER GRR 065

A Behavioral Study of *Phidippus audax*: Preference for Height, Connected Location, and Grid Location

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Alex Kayfish, Stephen Martin, Emily Noordyke
Mentor: Michael Henshaw

Jumping spiders are cursorial hunters that stalk their prey using sophisticated eyesight and spatial skills. As a result, they have the ability to learn and to navigate complex environments. We placed individual *Phidippus audax* (Bold Jumping Spider) spiders in a 4x4 grid of 44 cm tall dowels that were connected to each other by randomly placed paper bridges at 37 cm height. We assessed whether certain grid positions were more attractive than others to the spiders. We assessed *P. audax* preferences 1) for certain heights on the dowels 2) for dowels that were well connected to others vs. isolated ones and 3) for regions within the grid irrespective of connectedness (edges, center, front, back). We determined preference by the frequency with which the spider appeared in a specified location during a six hour trial. They frequently used the paper bridges and were most often found at 37 or 43 cm. Analyses of preferences for certain kinds of locations within the grid will also be presented.

KIRKHOF CENTER GRR 066

Modeling Potential Cougar Habitat in Michigan's Upper Peninsula

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenter: Denise Peterson
Mentor: Kin Ma

Once extirpated from most of its historic range, cougar (Puma concolor) numbers in the west gradually began to increase. Since 2008, Michigan's Dept. of Natural Resources (MDNR) has confirmed more than 30 sightings as cats disperse from the western states seeking territories and mates I will be conducting a suitability analysis using ArcGIS in order to determine how much habitat could potentially be available for future cougar pioneers in the Upper Peninsula. I intend to assess land cover, slope, human population density, and roadways as suggested by biologists who have previously studied cougar dispersal. Using data from the USGS, MDNR, NOAA, and from the United States Census Bureau, I intend to model and rank habitat suitability from highest quality to lowest. Ultimately, it is my hope that this model may be used in the future to determine how many cougars that the UP could support based on habitat suitability, while also taking into account prey requirements of the carnivore.

KIRKHOF CENTER GRR 067

A Computational Exploration of Redox Induced Electron Transfer

Participants attending 10:00 AM - 11:00 AM
Presenters: Sonny Haskins, Daniel Tjapkes
Mentor: Richard Lord

Electron transport is a common and well understood reaction that is an essential part of chemistry and biology. Recent exploration into electron transfer processes has brought to light a new phenomenon that has been coined RIET, or redox induced electron transfer. These reactions are not well understood and are somewhat counterintuitive. In a RIET reaction, which involves a first row transition metal, reduction of the complex results in oxidation of the metal and vice versa. Using density functional theory, we attempt to better understand these reactions by first benchmarking the known Ni systems against experimental results and then by extending the RIET phenomenon to other first-row transition metals.

KIRKHOF CENTER GRR 068

Rendering Invisible: The Erasure of Black Children with Down-Syndrome from the Organizations That Support Them

Participants attending 9:00 AM - 10:00 AM, 2:00 PM - 3:00 PM
Presenter: Dionna Cheatham
Mentor: Ayana Weekley

The intersections of race and socioeconomic status greatly impact the experiences of Black children with Down-Syndrome. This research project brings new attention to narratives concerning the portrayal of Black children with Down-Syndrome and the ways in which they are represented in organizations and foundations created to service them. In this paper, I discuss my preliminary findings of how race and socio-economic status are incorporated implicitly and explicitly within these organizations structure, by examining the organization's materials such as programs, initiatives, brochures and websites. This intersectional lens provides an opportunity for organizations to incorporate multi-layered identities of class and race as factors that shape these children lives and experiences of being disabled Black children. I elucidate that these organizations are not representing these children fully.

KIRKHOF CENTER GRR 069

Representation of Transgender Narratives in Mainstream Television

Participants attending 10:00 AM - 11:00 AM
Presenter: Luis Lopez
Mentor: Ayana Weekley

This project analyzes narratives surrounding transgender individuals within contemporary U.S. television shows, including “Pretty Little Liars,” “The Fosters,” and “Glee.” Previous research has shown that there is very little to no character representation of transgender people. However, we are in a critical point in U.S. culture where transgender people are slowly being incorporated into mainstream television. The argument here is that transgender narratives are following on early lesbian and gay narratives through a “coming out” story, though now the focus is on gender, not sexuality. This project is claiming that transgender narratives are reduced to bodies and gender representation. Through the use of a feminist media analysis, it will unpack preconceived notions of gender and sex and how these limited definitions restrict our knowledge of transgender people. It is expected that these shows will rely on stereotypes and the medicalization of the transgender body.

KIRKHOF CENTER GRR 070

Acute Versus Chronic Ostracism: Effects on Social Engagement

Participants attending 3:00 PM - 4:00 PM
Presenter: Brieanne Hancock
Mentor: Kristy Dean

Ostracism affects people of all ages at one point or another, and has garnered a lot of attention among social psychologists. There have been conflicting studies (O’ Reilly, Robinson, Berdahl, & Banki, 2015; Molden, Lucas, Gardner, Dean, & Knowles, 2009) about whether or not people reengage socially after being ostracized. We argue that the difference is due to different types of ostracism, acute and chronic ostracism. We hypothesize chronic ostracism elicits social withdrawal and potentially more socially conflicting behavior whereas those who face acute ostracism are more likely to socially reengage to try to achieve the social contact they missed out on.

KIRKHOF CENTER GRR 071

Intrinsic and Extrinsic Influences on the Aggressive Behavior of Female Crayfish, *Orconectes propinquus*

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Ryan Andringa, Nolan Hayden
Mentor: Daniel Bergman

Male crayfish are well known for their use of aggressive behavior to establish hierarchies that allow for increases in access to food or potential mates. Female aggression is more poorly studied and understood. In fact, previous studies on males have analyzed conditions such as previous winning and losing experiences, prior shelter possession, starvation, and olfaction obstruction that have effects on aggression. For our study, size-matched females were tested using these same treatments to ascertain which conditions have the most influence on female aggression. All aggression trials were recorded and then analyzed using a blind analysis scheme. We hope to elucidate the impact of each of the conditions towards female aggression.

KIRKHOF CENTER GRR 072

Investigating the Roles of MicroRNAs miR-34b/34c in Association with Alpha-synuclein Aggregation in Parkinson's Disease

Participants attending 10:00 AM - 11:00 AM
Presenters: Aaron Ripley, Sapana Shinde
Mentor: Sok Kean Khoo

Parkinson's disease (PD) is a neurodegenerative disorder characterized by abnormal aggregation of protein alpha-synuclein (aSyn) in the midbrain dopaminergic neurons. Recently, microRNAs (miRNAs), a class of small RNAs that regulates messenger RNAs have been studied as potential therapeutic agents to target dysfunctional genes/proteins in the oncology field. In PD, several miRNAs have been reported to control the expression of aSyn. Here, we aim to investigate the roles of two miRNAs, namely, miR-34b and miR-34c, which have been shown to down-regulate in PD brain specimens. We will establish an *in vitro* model that mimics aSyn aggregation phenotype using rotenone. We will use this cell model to examine the expression of miRNA-34b/34c in relation with aSyn aggregation in hope to develop miRNA-based molecules as potential disease-modifying agents for PD.

KIRKHOF CENTER GRR 073

Effects of Peppermint Oil on Physiological Functioning

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM, 3:00 PM - 4:00 PM
Presenters: Michael Berens, Bethany Busch, Jenna Schra, Joseph Stehouwer
Mentor: Amy Gyorkos

Objective: There is evidence to suggest that ingesting peppermint oil will improve physiological functioning within the respiratory and musculoskeletal system. The purpose of this study is to assess the effects of exercise performance following consumption of peppermint oil. Method and Materials: We used male and female Grand Valley student subjects that were willing to exercise following ingestion of diluted peppermint oil. Subjects' heart rate, blood pressure, lung function, and exercise perceived exertion and performance were measured at baseline and following exercise. Results: Testing is currently in progress. Conclusion: Testing is currently in progress.

KIRKHOF CENTER GRR 074

Different Pitheciine Genera Consume Different Amounts of Hard Annonaceae Fruits

Participants attending 9:00 AM - 10:00 AM
Presenter: Charlotte van Noort
Mentor: Cynthia Thompson

The Pitheciines are a diverse group of primates, ranging from the small titi monkeys (*Callicebus*) and sakis (*Pithecia*), to medium-sized bearded sakis (*Chiropotes*) and uakaris (*Cacajao*). Based on their dentition, titis would be expected to eat softer fruits, while bearded sakis and uakaris are particularly well-equipped to consume harder fruits. We have categorized fruit species from the family Annonaceae (custard apple) known to be eaten by these monkeys in order to find patterns in the types of fruits that are preferred. This family includes several genera that produce hard fruits, as well as many with soft fruits. Our findings support the anticipated pattern, with uakaris and bearded sakis incorporating the most hard species into their diet relative to fleshy species. Surprisingly, sakis were found to consume a similar amount of hard fruits as titis, despite their more specialized dentition.

KIRKHOF CENTER GRR 075

Effect of Bench Press Load Knowledge on Repetitions, RPE, and Attentional Focus

Participants attending 2:00 PM - 3:00 PM
Presenters: Zachary Cox, Johnathon Kim, Daniel Pillivant
Mentor: Christina Beaudoin

The central governor theory states that metabolites that act through sensory feedback mechanisms act on the brain and spinal cord, allowing the nervous system to decide the extent of skeletal muscle recruitment during exercise. This ensures that homeostasis is maintained throughout exercise, regardless of the conditions of the exercise. This study investigated the role of the central governor theory and teleoanticipation during resistance training, using the bench press. After gathering maximal values on day one, known and unknown trials were used on day two to assess teleoanticipation, ratings of exertion, and attentional focus values. Differences in repetitions performed during the known and unknown trials would indicate pacing strategies and teleoanticipation. Results of this study will contribute greatly to knowledge of teleoanticipation during anaerobic exercise.

KIRKHOF CENTER GRR 076

When and How Did the Intraplate Ozark Mountains Form and Are They Actively Rising?

Participants attending 1:00 PM - 2:00 PM
Presenter: Katy Reminga
Mentor: John Weber

The Ozarks in Missouri and Arkansas pose a geologic anomaly. Plate tectonics, one of the most successful theories in the geosciences, predicts that mountains should form along the edges of plates. However, a mechanism to describe the formation of this particular geologic anomaly has not yet been published. The Ozarks, an uplifted block exposing old Precambrian basement rocks, clearly sits in the middle of the North American plate and continent, contrary to this theory. Recent Earthscope data suggest that the Ste. Genevieve fault, which bounds the Ozarks on its steepest and highest northeastern side, may still be active today. We propose a pioneering study of a range of geomorphic (landscape) and geologic features to test how these intraplate mountains form and whether the Ozarks may be actively rising today.

KIRKHOF CENTER GRR 077

The Potential for Gut Bacterium to Modulate Mood and Behavior: Focus on Anxiety and Depression

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenter: Kendall Frimodig
Mentor: Steven Hecht

Recent studies suggest that the gut-microbiome may significantly affect endocrine, immunologic, and metabolic pathways that mediate neurological processes such as behavior and mood. These processes driven by the gut-brain-microbiota axis have primarily been shown in murine models, however clinical trials with probiotics have shown a correlation between the composition of the gut-microbiome and depressive symptoms.The aim of this review is to encompass the current understanding of the neurobiological involvement of intestinal flora, with specific regard to abnormalities in mood and behavior characteristic of depression. In addition, potential probiotic treatments which may mitigate the depressive effects of an abnormal microbiome will be discussed.

KIRKHOF CENTER GRR 078

For My Disabled Black Mothers: The Intersections of Welfare, Blackness and Motherhood

Participants attending 9:00 AM - 10:00 AM, 1:00 PM - 2:00 PM
Presenter: Dionna Cheatham
Mentor: Kimberly McKee

The intersections of race, socioeconomic status, policy, and disability greatly impact the experiences of Black mothers, their children and caretakers. This poster also highlights survey findings of the adult children of mothers with disabilities. The inclusion of these voices provides a new lens to consider how these families are explicitly and implicitly shaped by federal and state policies. The study reveals the broader needs of these families related to access to health care, transportation, housing, education, food security, and income. The study contributes to an ever-expanding knowledge base concerning black families in its examination of the stigmatization and devaluation of poor black mothers under the new welfare provisions, the differential access to and disproportionate spending of social resources on childcare, healthcare, and disability support.

KIRKHOF CENTER GRR 079

Midshaft Tibial Stress Fracture Versus Osteoid Osteoma in a Professional Dancer – the Complicated Diagnosis: A Case Report

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenter: Heather Pietrzak
Mentor: Shari Bartz-Smith

Background: A ballet dancer presented with anterior tibial pain at the start of dance season. She was diagnosed initially with MTSS. The pain persisted for four months despite treatment and eventually caused her to miss her dancing season. Differential Diagnosis: Medial tibial stress syndrome, osteoid osteoma, periostitis, tibial stress fracture. Treatment: Upon referral an x-ray was ordered which revealed a stress fracture of the left tibia and placed in a walking boot for seven weeks. Pain persisted after removal of the boot, a CT scan revealed an osteoid osteoma (benign bone tumor). She took the summer off and returned the next season without complication. Uniqueness: Multiple diagnoses from several physicians existed. Conclusions: It took over 5 months, two athletic trainers and two physicians to achieve diagnosis. Clinical Application: It's important for Athletic Trainers to work together and openly communicate amongst each other to establish the best treatment plan for athletes.

KIRKHOF CENTER GRR 080

Substrate Preferences and Use in the Jumping Spider, *Phidippus audax*

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, 4:00 PM - 5:00 PM
Presenters: Cody Gauthier, Emily Hamel, Zoie Williams
Mentor: Michael Henshaw

Jumping spiders stalk their prey while moving through a complex environment. *Phidippus audax* is a common jumping spider in old fields containing a variety of stems on which to navigate. We created an arena with dowels that varied in diameter (1/8", 1/4", 3/4") to explore how they used different substrates. Spiders preferred dowels to the floor, but spent similar times on dowels of different diameters. The average length of visits to the floor or medium dowels was longer than to small or large dowels. Spiders missed more often when jumping from small dowels. Thus, there do appear to be function differences between different substrates which did not lead to differences in use. It may be that they must use all available substrates, even when suboptimal to fully explore the environment. The placement of the medium dowels in the middle of each set may have skewed our results, and in the future we should randomize the placement of dowels of different diameters in each set.

KIRKHOF CENTER GRR 081

Putative Pathogencity Island in *Salmonella enterica* Serovar Typhimurium

Participants attending 10:00 AM - 11:00 AM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenters: Adam Pickrum, Steven Wilkinson, Shaowen Xu
Mentor: M. Aaron Baxter

Salmonella enterica serovar Typhimurium is a Gram-negative bacterium that causes localized gastroenteritis. The disease is initiated by the activation of virulence genes responsible for the invasion of the intestines, and subsequent survival in phagocytic cells. The genes needed for virulence are often clustered in regions known as pathogenicity islands. A region of DNA was discovered in *Salmonella* that has all of the attributes of a pathogenicity island. Subsequently, polar mutations were created in most of the putative operons, and assays are being performed to determine the impact of these mutations on invasion, adherence, motility and macrophage survival. Our current work has focused on testing the impacts on motility and invasion, with assays that compare each the mutants to wild type *Salmonella*. Future work will expand our analysis of this region employing additional assays to determine whether these *Salmonella* specific genes have an effect on pathogenesis.

KIRKHOF CENTER GRR 082

Influence of Fatty Acid Structure on Endothelial Cell Inflammation

Participants attending 10:00 AM - 11:00 AM
Presenter: Danielle Davis
Mentor: David Kurjiaka

Fatty acids (FA) in the bloodstream, often elevated due to diet, can directly bind receptors on arterial endothelial cells leading to either increased or decreased inflammation, depending on FA structure. Chronic inflammation in endothelial cells is associated with several diseases, including atherosclerosis, and results in altered protein expression. Connexin 43 (Cx43) , a protein uncommon in healthy arterial endothelial cells, is upregulated during inflammation. We will compare the response of endothelial cell Cx43 expression to five structurally different 18-carbon FAs after twelve hours of exposure. We hypothesize that alpha linolenic acid (n-3 cis-unsaturated), linoleic acid (n-6 cis-unsaturated), and oleic acid (cis-unsaturated) will decrease endothelial cell Cx43 in a dose-dependent manner while stearic acid (saturated) and elaidic acid (trans-unsaturated) will increase endothelial Cx43 in a dose-dependent manner.

KIRKHOF CENTER GRR 083

The Role of Trolling in Shaping Cultural Discourse and Identity: A Case Study of an Anonymous Internet Message Board

Participants attending 11:00 AM - 12:00 PM
Presenter: Marc Lehman
Mentor: Michael Wroblewski

Recent literature discussing internet trolling has largely focused on two roles of trolling in online communities. First, instances of trolling and individual responses to such serve to distinguish who does and does not belong to the community. Second, trolling serves as a particularly effective vehicle for innovation and expansion of culture in online communities. This study examines a case of the online message boards of Letsrun.com, which exist in a communicative paradigm largely characterized by anonymity and vitriolic elitism. Here, community membership is demarcated and cultural knowledge is dispersed by trolling, but some trolls also exist as temporally continuous, discrete characters that perform condensed, exaggerated versions of community discourse. Through enacting these exaggerated tropes, these 'caricatures' serve as focal points around which the users align themselves, thus shaping community identity, discourse, and communicative practice in general.

KIRKHOF CENTER GRR 084

Effects of Caffeine on Repeated Sprint Performance in Male College Athletes

Participants attending 1:00 PM - 2:00 PM
Presenters: Drew Guibord, Jordan Krygsheld, Jessica Zeitler
Mentor: Ross Sherman

Background: Caffeine is known to be a stimulant that is widely used for decreasing fatigue and has been shown to effectively increase performance in endurance trials. However, little research has been done to examine caffeine's effect on sprint performance. Purpose: To determine the effects of caffeine on repeated sprint performance in male college-aged athletes. Methods: In a randomized, single-blind experiment, 8 male college-aged athletes ingested either 6 $mg*kg^{-1}$ body mass caffeien or maltodextrin (placebo) 60 minutes prior to completing 10 sets of 20 m sprints. Each sprint was separated by a 15 second rest period to prepare for the next run. Prior to testing, participants completed a familiarization trial without any treatment given. The two testing sessions were one week apart. Sprint time was recorded using infra-red timing light gates, used to compare sprint performance and fatigue between the two trials. Results: Data will be presented at Student Scholars' Day.

KIRKHOF CENTER GRR 085

Does the Intensity of Raccoon Roundworm Infection Correlate with Egg Production?

Participants attending 9:00 AM - 10:00 AM
Presenters: Kara Krupp, Elizabeth Ritchie
Mentor: Joseph Jacquot

Baylisascaris procyonis is an intestinal parasite found primarily in raccoons. The eggs are transmitted through fecal-oral contact with an infected raccoon. Common in the United States, *B. procyonis* can be found in about two-thirds of adult raccoons. While raccoons are the definitive hosts for the parasites, many species of mammals and birds can be infected with raccoon roundworm (RRW), including humans. The severity of infection is dependent on the number of eggs ingested and where the larvae migrate in the body. However, there is a gap in knowledge as to whether or not the intensity of infection correlates to egg production. In a blind study, we aim to quantify RRW eggs from fecal samples derived from raccoons with known intensity of RRW infection. Data collection is ongoing, but we hypothesize there will be a positive correlation between the intensity of infection and the number of eggs produced.

KIRKHOF CENTER GRR 086

The Effects of Unitization on Forced-Choice Recognition Tasks

Participants attending 1:00 PM - 2:00 PM
Presenter: Trisha Zimmerman
Mentor: Joel Quamme

The present study investigated decision-making mechanisms in associative memory. Previous research suggests that when people interpret associations as a single unit (unitized), they use different processes to remember them compared to when associations are interpreted as links between two items. Participants were presented with a list of word pairs to study, and asked to interpret them as a compound word or as two words in a sentence. After studying the word-pairs, we then tested their memory for the previously viewed words. The test format was also manipulated, where response choices either had overlapping words or they did not. The two formats should require different decision rules when making memory judgments. We predicted that performance will be better on non-overlapping conditions; however this will depend on whether the word-pairs were learned as a compound or a sentence. We will discuss the results of the study and the implications for the organization of associative memory.

KIRKHOF CENTER GRR 087

Understanding the Medieval Nuns' Perspective of Sacred Space through Material Culture

Participants attending 1:00 PM - 2:00 PM
Presenter: Selena Soto
Mentor: Grace Coolidge

In the medieval time period, the Church, monasteries, and nunneries represented the concept of the sacred for the community. In these places individuals of the laity could experience the sacred, escaping from their usual secular activities. However, the experience of the laity might not have matched the experiences of those who lived within these sacred places on a daily basis, participating in both religious and secular tasks within a sacred space. Due to a lack of accounts by medieval nuns in this time period, this project uses material culture associated with sacred space in analyzing brief histories of 36 medieval English nunneries from the Victoria County Histories online database. It was found that the self-sufficient way in which nunneries were established by the Church made these institutions dependent upon secular tasks in order to maintain the religious tasks. Therefore, nunneries can be considered as devotional spaces rather than separated into sacred and profane spaces.

KIRKHOF CENTER GRR 088

Characterization of Morphological and Genetic Differences in the Bold Jumping Spider, *Phidippus audax*

Participants attending 10:00 AM - 11:00 AM
Presenter: Brandon Beltz
Mentor: Michael Henshaw

Differentiation between populations of the same species may lead to reproductive isolation that prevents interbreeding between groups. This phenomenon, known as allopatric speciation, is an important natural process that is not fully understood. The bold jumping spider, *Phidippus audax*, is an excellent model for study because it has distinct populations that exhibit morphological differentiation and shows evidence of interbreeding between populations. We have collected *P. audax* individuals from distinct northern and southern populations and sequenced part of the Cytochrome Oxidase I gene to characterize the extent of genetic differentiation. In the near future, we will investigate the possible causes and origins of these distinct populations with the hopes that we may discover what started the divergence and possible speciation of *Phidippus audax*.

KIRKHOF CENTER GRR 089

Football and Femininity: A Qualitative Analysis of Super Bowl Commercial Representations

Participants attending 3:00 PM - 4:00 PM
Presenter: Meredith Miller
Mentor: Ayana Weekley

For this research study one soft drink Super Bowl commercial per year from 1994 to 2014 was coded for themes related to 'traditional' gender roles. This qualitative study used a feminist poststructuralist approach to look specifically at the social construction of 'femininity' within commercials. The research questions included: How do the representations of females and feminine individuals in Super Bowl commercials perpetuate a definition of femininity that is rooted in hegemonic masculinity? How is this manifested specifically within soft drink commercials? Is there presence of an alternative definition of femininity within these commercials? Do the representations change over time? The hypothesis was that there is one central definition of femininity represented in the commercials throughout the twenty year span that is centered on the assumed gender roles within hegemonic masculinity, and has little to no deviation.

KIRKHOF CENTER GRR 090

Role of Perceived Distance on Focus during 10 km Running

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenters: Danielle Johnson, Crystal Mulder, Lindsey Remski, Brian Thompson
Mentor: Ross Sherman

Background: Pacing strategies, influenced by internal and external cues, are used during continuous aerobic exercise. Previous research shows that as work and distance increases, focus becomes more internal. Incorrect distance feedback does not appear to affect perceived effort, and work rate is not different when distances are perceived as the same, regardless of true distance. Purpose: To analyze the effect of incorrect distance feedback on perceived effort and focus during 10 km running. Methods: 10 healthy runners completed three 10 km time trials at a self-selected pace using a randomized crossover design. Two of the trials were actually 9 km and 11 km, but participants were deceived as to total distance completed. Measures of perceived exertion, focus, HR, and pace were collected after every 1 km, and participants also gave post-run feedback of their focus during each of the 10 km runs. Results: Will be presented at Student Scholar's Day.

KIRKHOF CENTER GRR 091

Social Evolution in the *Photorhabdus – Heterorhabdus* System

Participants attending 9:00 AM - 10:00 AM
Presenters: Jillian Green, Adam Pickrum
Mentor: M. Aaron Baxter

Photorhabdus luminescens, an insect pathogen, is symbiotic with pathogenic nematodes. Upon its release from the nematode, the bacterium transcribes *mcf1*; inducing apoptosis within the insect midgut epithelium, destroying the intestinal lining and eventually killing the caterpillar. Mcf1, a large protein, requires a lot of metabolic energy to be produced and secreted. During infection, microorganisms communicate/cooperate with one another to perform tasks that benefit the local population. Cooperators create a 'public good' (the Mcf1 toxin) and 'cheaters' don't produce the 'good' but benefit from its production. Current efforts are aimed at creating a *P. luminescens mcf1* mutant to study the social evolution of the mutant vs. wild type. Evolutionarily, it is thought that *P. luminescens mcf1* conserves metabolic energy and gains the benefits from those producing Mcf1. Future studies will determine the fitness consequences this mixed population of bacteria has within the insect host.

KIRKHOF CENTER GRR 092

Increasing Breastfeeding Support and Promotion in Kent County Through Web Presence & Social Media

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Nick Ciliak, Megan Meiste, Heather VanOss
Mentor: Kelli Damstra

The purpose of this project was to increase support and promote breastfeeding rates in Kent County through the use of improved web presence and social media. The main source of outreach for our project was through the creation of a new website for the Healthy Kent Breastfeeding Coalition. Their previous website was not user friendly, so our goal was to create a completely new site that is more easily accessible to the community with updated information. The website highlights information about where new mothers can find breastfeeding help and support, details events that are happening in the community and provides breastfeeding facts and information in a positive manner. In addition to creating a new website, we created business cards for the Coalition, made a Twitter account, updated their Facebook account, accessed the Coffective breastfeeding app for the county, and updated the Coalition's current information, resources and brochures.

KIRKHOF CENTER GRR 093

Presence and Distribution of Polycyclic Aromatic Hydrocarbons in Sediment Contaminated with Tar Sands Crude Oil

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Kayla Lockmiller, Nicholas Woldyk
Mentors: Tara Kneeshaw, Min Qi

Contamination of sediment with polycyclic aromatic hydrocarbons (PAHs), which are derived from crude oils, pose significant human and environmental threats. This study sought to evaluate the persistence of PAHs in sediment near Ceresco, MI and to determine possible correlation between PAH and grain size. A pipeline break in 2010 spilled ~843,000 gallons of diluted bitumen from Alberta, Canada's Athabasca oil field into the Kalamazoo River. Sediment was collected near the spill site and analyzed using gas chromatography-flame ionization detection for 17 PAHs. Results indicate PAHs are present in all samples. A detailed analysis of grain size was also carried out on each sample. There is some variability in the presence of specific PAHs between sample location and sediment grain size fraction, though identifying a clear correlation is complex. Use of tar sands oil is projected to increase; therefore, understanding the fate of PAHs is crucial to remediation preparedness.

KIRKHOF CENTER GRR 094

Impact of Acute Hyperbaric Oxygen Treatment on Gut Motility

Participants attending 10:00 AM - 11:00 AM
Presenters: Michaela Kastura, Samuel Nystrom, John Wesley
Mentor: Francis Sylvester

The purpose of this study is to determine the effect of hyperbaric oxygen therapy on gut motility. Our laboratory has observed changes in the physiological responses of mesenteric arteries following acute exposure to hyperbaric oxygen. As such, the smooth muscle of the intestinal wall may also be affected by acute exposure to hyperbaric oxygen. Approximately 1.0cm segments of porcine small intestines were placed in a hyperbaric chamber at 1.75ATA with either 100% oxygen or room air. The intestinal segments were mounted in isolated organ baths coupled to force transducers at 5.0g passive tension. Serial doses of potassium chloride, acetylcholine and phenylephrine were independently added to the organ baths and the subsequent changes in contractile tension were then recorded. Preliminary findings indicate that the intestines are responsive to each of the agonists. Further studies will be performed to determine potential differences in gut motility upon exposure to hyperbaric treatments.

KIRKHOF CENTER GRR 095

A 'Self-Made' Town: Semi-Annual Furniture Expositions and the Construction of Civic Identity in Grand Rapids, 1878-1965

Participants attending 9:00 AM - 10:00 AM
Presenter: Scott St Louis
Mentor: Matthew Daley

Beginning in December 1878, prominent business figures in the city of Grand Rapids established semi-annual Furniture Expositions. At first glance, these expositions might seem to have been a mere manifestation of the community's recognition as America's "Furniture City." However, they actually constituted a fundamental cause behind the construction of this civic identity by local business leaders, who worked together to make the Grand Rapids name synonymous with excellent household furniture on an international scale. With the help of supportive community members, these leaders also resolved to prevent similar efforts in rival cities – including such urban powerhouses as New York and Chicago – from eclipsing their own. The astonishing extent of their success provided the city with a more prominent niche in the national consciousness, and transformed the physical and economic landscape of the community itself.

KIRKHOF CENTER GRR 096

Emotion Norms in Media: Acculturation in Hispanic-American Children's Storybooks Compared to Heritage and Mainstream Culture

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenter: Victoria Sanders
Mentor: Wolfgang Friedlmeier

Cultural artifacts like children's books may serve to facilitate learning of cultural norms. We compared European-American (EA), Hispanic-American (HA), and Mexican (MEX) books to infer cultural differences in general and emotion norms and to explore acculturation orientation reflected in HA books. *N*=1059 images were coded from 10 popular books from each culture. Differences in general norms were represented by greater protagonist display and balanced gender in EA books, and by more males in MEX books. HA books were similar to EA in general norms. Differences in emotion norms were partially confirmed, as MEX and HA books displayed negative socially disengaging emotions much less often than socially engaging emotions, while EA books showed similar rates for both types. However, HA books displayed the lowest intensity, especially female characters and displayed mostly positive emotions, indicating minority effects. Results support a domain-specific acculturation orientation model.

KIRKHOF CENTER GRR 097

SpeedStacks – a School Health Intervention Tested in Rural Ghana

Participants attending 12:00 PM - 1:00 PM
Presenters: Chloe Bielby, Katelyn O'Grady
Mentors: Azizur Molla, Julia VanderMolen

Challenging Heights, a non-profit organization in Ghana, West Africa rescues trafficked children from the large fishing industry of Lake Volta. The children are sold into trafficking at a young age, and are physically and verbally abused. As a result, they do not develop proper motor control and mental health skills. In order to help these children to gain and recover these life skills, SpeedStacks, a physical education curriculum developed in the United States, was used to aid in the development of motor control and teamwork abilities. The goal was to introduce SpeedStacks to the children at Challenging Heights. Students were taught in small groups how to complete the classic 3-3-3, 6-6, and 1-10-1 sequence. The sequences assisted in the children's overall mental health. This promising indication of SpeedStacks provided a positive influence at Challenging Heights School. Additionally, teachers were taught how to use SpeedStacks tools to ensure sustainability of the program.

KIRKHOF CENTER GRR 098

Secondary Analysis of Symptom Experience in NAFLD: Symptoms of the Disease or Medications Side Effects?

Participants attending 3:00 PM - 4:00 PM
Presenters: Jenna Buchman, Nicholas Vanoosten
Mentor: Lori Houghton-Rahrig PhD RN

Methods. In the original study, 42 participants with NAFLD were recruited from bariatric surgery and gastroenterology offices in Western Michigan. From the 77 classes of medications used by the participants, analysis yielded the 17 most frequently used medication classes. Results. Upon removing the symptoms associated with medication side effects, the remaining symptoms included: "lack of energy" (71.4%), followed by "fatigue" (59.5%), "aches and discomfort in the right lower rib area or below" (35.7%), "constipation", (30.9%), and "nausea" (26.2%). These data suggest a relationship between reported symptoms and NAFLD. Conclusion. The results of this study offer new insight towards earlier NAFLD identification, as well as confirm previous NAFLD research. Further study with a larger sample size controlling for lifestyle habits, demographics, and environmental factors of the participants are needed.

KIRKHOF CENTER GRR 099

Exploring the Serine/Threonine Protein Phosphatase Dis2 and a Possible Direct Regulation on Mid1 in Fission Yeast

Participants attending 1:00 PM - 2:00 PM
Presenter: Anna Barry
Mentor: Dawn Hart

Schizosaccharomyces pombe is a family of fission yeast that divide by medial fission and is a great model for the study of human cell division. The scaffolding protein Mid1 is required for proper placement of the actomyosin ring telling the cell where to divide. Mid1 localization to the cell cortex is regulated through phosphorylation and previous experiments from our lab determined that Mid1 is a substrate of the serine/threonine phosphatase Dis2. To further explore the relationship between Dis2 and Mid1 *in vivo*, we created a phosphatase dead version of Dis2. We created a mutation at the conserved position in Dis2 (H124A) to observe the consequence of inactive Dis2 on Mid1. When Dis2 is present, Mid1 localizes to the nucleus, cortical nodes and division site as expected. Phosphatase dead Dis2 shows dispersed Mid1-GFP across the cytoplasm. Our results suggest that Mid1 localization during interphase and mitosis is specifically regulated by Dis2 phosphatase activity.

KIRKHOF CENTER GRR 100

The Acoustics of the Louis Armstrong Theatre

Participants attending 10:00 AM - 11:00 AM, 12:00 PM - 1:00 PM
Presenter: Bailey Groendyke
Mentor: Karen Gipson

The Louis Armstrong Theatre (LAT) at GVSU has been reported to have unsatisfactory acoustics for music performance. Reverberation time (RT) was measured by filling LAT with sound and measuring as per ASTM E2235 protocol, and the initial time delay gap (ITDG) was determined using slapsticks as an impulsive sound source. A model of LAT was also constructed from blueprints and physical measurements; simulations using this model were conducted using ODEON to measure RT and early decay time (EDT). Data from simulations and physical measurements confirmed RTs were smaller than desired for music, whereas ITDGs showed prevalent spurious reflections. Modifications to the model were made to increase RT and reduce undesirable reflections to improve LAT for musical performance without compromising its functionality for speech. Modifications including reflective surfaces and diffusers experienced slightly higher RTs; however, modifications featuring a full acoustic shell greatly improved EDTs.

KIRKHOF CENTER GRR 101

Assessing Working Memory Load During Logical Thinking by Measuring the Task-evoked Pupillary Response

Participants attending 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenter: Ryan Zahran
Mentors: Nathan Barrows, Jessica VandenPlas

Previous research has indicated that students often struggle to solve problems in chemistry for a variety of reasons including lack of prior knowledge, weak logical thinking skills, and working memory limitations. While content tests can provide a measure of prior knowledge, it is difficult to accurately measure logical thinking skills and working memory limitations. The task-evoked pupillary response (TEPR) has recently been used as a correlate of the load placed on working memory during problem solving. The TEPR is a small, involuntary dilation of the pupil in response to mental effort. The purpose of this study is to investigate TEPR as a real-time measure of working memory load during tasks requiring logical thinking. Twenty participants completed several different digit span tests during which the TEPR was measured. Results of this study may help researchers and classroom teachers to better measure and understand the difficulties faced by their students.

KIRKHOF CENTER GRR 102

The Engaged Department Initiative: GVSU, GRCC, and Aquinas Join Forces for Place-Based Impact

Participants attending 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM, 4:00 PM - 5:00 PM
Presenter: Gloria Mileva
Mentor: Danielle Lake

The Engaged Department Initiative (EDI) is a place-based cross-institutional collaboration located in the Grand Rapids (Michigan) region. Participating organizations include Michigan Campus Compact (MiCC), Grand Valley State University (GVSU), Grand Rapids Community College (GRCC), and Aquinas College (AQ). This innovative ethnographic case study is focused on evaluating how well the initiative completes their goals of increasing faculty knowledge and skills, expanding students' community engagement, fostering intra- and inter- collaborations between the three institutions of higher education, and enhancing community partnerships. The hopes of this initiative are to make a real difference in the community and to create engaged citizens. By disseminating this research, we aspire to offer recommendations for people interested in spanning boundaries and working on place-based change in their own region.

KIRKHOF CENTER GRR 103

Effects of Various Warm Ups on 1RM

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: Ethan Ames, Benjamin Geierman, Hanzo Jimenez, Caleb Rohr
Mentor: Amy Gyorkos

A number of warm ups have been used by athletes to maximize their performance during strength training. The warm ups vary from stretching, to graduated liftitng methods, to aerobic methods. The purpose of this study is to compare these warm up methods and their effect on strength performance using 1RM. These various warm up methods will be used before an athlete performs a 1RM. The data will be compared to determine the method that produces the best results. Data are currently being collected.

KIRKHOF CENTER GRR 104

Effects of High Fat Meals on Fat Utilization During Exercise

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: Michelle Arnett, Chandler Cobb, Carley Gross, Angela Vettori
Mentor: Amy Gyorkos

For some the goal of exercise is not to improve performance but to use fat as a fuel source. This makes it important to understand the circumstances that favor the utilization and mobilization of fats. It is suspected that the composition of a pre-exercise meal will influence the rate and type of substrates utilized during physical activity. Specifically it has been found that high CHO meals lead to decreased fat utilization due to the release of excess insulin. A less studied aspect is the effect that high fat meals may have, though the postulated theory is high fat meals lead to greater fat utilization through favoring of oxidative metabolic pathways. The purpose of the current study is to further explore this theory and determine whether the high fat meals will lead to an increase in postprandial fat utilization and metabolic rate during exercise. Data are currently being collected.

KIRKHOF CENTER GRR 105

Validity Testing of iPhone Vertical Jump Apps

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM, 2:00 PM - 3:00 PM
Presenters: Casey Coleman, Ricky Matthews, Blaine Sackett, Caitlyn Waller
Mentor: Amy Gyorkos

Due to advances in technology, apps have been created to test athletic ability. There are two apps in particular that claim the software can measure a person's vertical jump. The purpose of this study is to see if the two phone apps and a more trusted piece of clinical equitment are all close to a certain degree in measuring vertical jump height. If they are found to be inconsistent, calculations can be made to see if they are off by a certain amount from an average of all the attempts. Participants from any fitness level who are able to jump without any pain will perform a vertical jump test while being measured by these three pieces of equipment. The three pieces of measuring equitment will be used at the same time during a single vertical jump test with multiple attempts, and allowing rest in between, for each participant. The data are currently being collected.

KIRKHOF CENTER GRR 106

Does Exercise Improve Acute Memory?

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Juliana Alvarado, Breanna Gruppen, Rylee Hanson, Madeline Kamps
Mentor: Amy Gyorkos

Exercise has many health and physical benefits, including positive effects on acute memory. Studies have shown that exercise can improve long term memory. Further research is needed to evaluate long term memory following various exercise prescription. The purpose of this study is to assess long term memory following both high and low aerobic exercise. Subjects will be randomly assigned to a control rest group, high intensity, and low intensity groups. The subjects will be asked to cycle at 60 RPM on a cycle ergometer at either 50% HHR (low) or 80% HHR (high). The control group will rest for five minutes. Following the rest period and the aerobic exercises the subjects will be asked to recall fifteen new images. After a minute of looking at the photos they are given another minute to recall as many of the pictures previously seen as they can. There is a need for a control group who will receive no exercise after looking at the pictures for a minute. The data are currently being collected.

KIRKHOF CENTER GRR 107

Vaccines and the Media

Participants attending 1:00 PM - 2:00 PM
Presenters: Anna Berglund, Elyse Komarzec
Mentor: Jane Toot

We will be focusing on the influence of media on medicine including sources from talk shows, reality tv, dramas and the news.The media, including news, reality TV, talk shows, and dramas have a profound influence on societal views of vaccines and individual preferences for receiving them. This has been a large issue in the news over the past couple of years. It has led to more people deciding against vaccinations, and an increase in disease outbreaks of illnesses that were virtually eradicated. People need to be educated about the truth about vaccines, because the media continues to spread fallacies and misinformation. We will pull together scholarly articles relating to the topic and prime examples in the media today. We will also have a discussion section on different ways to counter what the media is telling people.

KIRKHOF CENTER GRR 108

Invasive Epigeic Earthworms Reduce Salamander Populations in Mesic Lowland Forests of a Michigan Ravine Ecosystem

Participants attending 11:00 AM - 12:00 PM
Presenter: Hunter Brunges
Mentor: James Dunn

Earthworms are an invasive species that are causing ecological damage to northern forest ecosystems, and impacting organisms that live within the leaf litter, such as salamanders. We sampled earthworms at 36 sites within three ravines using the mustard extraction method. We surveyed salamander populations on two dates at each site using cover boards. We also collected data on slope aspect, altitude, soil moisture, leaf litter coverage, canopy cover, and coarse woody debris at each site. Our results show that epigeic earthworms in north facing, low elevation sites had a negative effect on salamander abundance, and that anecic earthworms had a negative impact on leaf litter in south facing, low elevation sites. However, we also found that anecic earthworm populations had a positive effect on salamander abundance. Using GLIMMIX GLM modeling we found that epigeic earthworms had a negative effect on salamander populations, while anecic earthworms had a positive effect.

KIRKHOF CENTER GRR 109

Metabolic Demands of ElliptiGO Cycling Compared to Running

Participants attending 1:00 PM - 2:00 PM
Presenter: Mary McBride
Mentor: Kyle Barnes

ElliptiGO cycling is a new form of exercise; the metabolic demands, however, have not been investigated. In a cross-over design, 17 runners completed 5×3 min stages while either cycling on a stationary ElliptiGO or running on a treadmill during which HR, RPE, and expired gases were collected using a portable metabolic analyzer. Subjects increased one gear, or 1 mph, every 3 min during cycling, or running, respectively. A 10 min recovery between modes of exercise was given. For each testing intensity, metabolic demand (VO_2), HR, and V_E was significantly higher during running ($p < 0.05$), however the RPE for each intensity was similar ($p > 0.05$). There was a linear relationship between speed and VO_2 but the relationship for running had a steeper slope compared to the ElliptiGO. As a result, the ElliptiGO speed that was equivalent to the VO_2 of each running speed increased at a greater rate. When matched for VO_2, the HR, V_E, and RPE were actually higher for ElliptiGO compared to running.

KIRKHOF CENTER GRR 110

The Effects of Tart Cherry Juice on Blood Pressure and Muscle Pain

Participants attending 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Katelyn Benvenuti, Chelsey Doorenbos, Melissa Feldt, Grace Vander Weide
Mentor: Amy Gyorkos

The intake of cherry juice has been shown to help improve muscle pain after a bout of exercise. It has additionally been used to help lower blood pressure. We will be testing to see how cherry juice effects collegiate rowers after a five-minute sprint. Data are currently being collected.

KIRKHOF CENTER GRR 111

Effect of a Single BCAA Supplementation on Power During Wingate

Participants attending 9:00 AM - 10:00 AM
Presenters: Jennifer Fields, Kathleen Kavanagh, Elizabeth Kayfish, Margaret Smith
Mentor: Amy Gyorkos

INTRODUCTION: Pre-workout BCAA supplements are consumed by athletes for the claims that they will increase performance. PURPOSE: To investigate if an acute dose of a BCAA supplement has an effect on power performance during the Anaerobic Wingate Test. METHODS: Two Wingate Tests were performed on two separate testing days. On day one, the Wingate Test

was administered without the BCAA supplement and served as the control. BCAA pre-workout supplement was given prior to the Wingate Test on the second day. Power output was assessed by looking at peak power and percent power drop. RESULTS & DISCUSSION: There is a significant decrease in peak power with the consumption of BCAA supplementation, however no difference was observed in the power drop. We conclude that a single dose of BCAA was not found to be positively effective on power performance and therefore not recommended for increases in performance during the Anaerobic Wingate Cycle Ergometer Test.

KIRKHOF CENTER GRR 112

Using Nutrient Bioassays to Assess the Impact of Land Use Practices on Urbanized Lakes: Muskegon Lake Area of Concern

Participants attending 10:00 AM - 11:00 AM
Presenter: Brittany Jacobs
Mentor: Alan Steinman

The purpose of this research was to examine whether land use changes have indirectly influenced periphyton within the Muskegon Lake, Michigan Area of Concern due to altered nutrient concentrations. A study using nutrient diffusing substrata was conducted to determine the impact of nitrogen (N), phosphorus (P), combined N+P additions and a control on chlorophyll a accumulation of periphyton growth in Bear and Muskegon Lakes. Results indicated 1) overall periphyton growth was much greater in Muskegon than Bear Lake, irrespective of treatment; 2) periphyton were primarily limited by P and secondarily co-limited by N+P in Muskegon Lake; and 3) periphyton were co-limited by N+P in Bear Lake. Despite taking place in directly connected lakes, these different responses suggest local factors have an influence on algal response to nutrients. These results explain how urban sprawl may be one factor at work in the Muskegon Lake Area of Concern.

KIRKHOF CENTER GRR 113

Timing of Carbohydrate Ingestion Prior to Aerobic Exercise and Subsequent Glucose Availability and Running Performance

Participants attending 11:00 AM - 12:00 PM, 12:00 PM - 1:00 PM
Presenters: Jacqueline Beauregard, Courtney Ziegler
Mentor: Ross Sherman

Background: Many studies have investigated the effects of carbohydrate (CHO) ingestion during prolonged exercise but few have looked at the timing of pre-exercise CHO ingestion. Purpose: To investigate the effects of differing pre-exercise CHO ingestion time on glucose availability during exercise and 5 km run performance. Methods: Four college students participated in four trials, each seven days apart. Prior to each trial, subjects were asked to abstain from alcohol, tobacco,

and vigorous exercise as well as keep a 24 h diet log and replicate the diet for later trials. They ingested either 1.0 $g*kg^{-1}$ body weight CHO or an artificially sweetened placebo 15 min or 75 min prior to exercise. Participants exercised on a treadmill at 65% HR reserve for 10 min and then ran a 5 km time trial. Blood lactate and glucose levels were measured pre-ingestion, pre-exercise, and pre and post-5 km time trial, along with HR, CHO oxidation, and perceived exertion. Results: To be presented at SSD.

KIRKHOF CENTER GRR 114

Classifying *7* Dimensional Indecomposable Solvable Lie Algebras With Niradical Isomorphic to $A_{5,1} \oplus R$

Participants attending 2:00 PM - 3:00 PM
Presenters: Kevin Bertschinger, Daniel Kosten
Mentor: Firas Hindeleh

This poster is the third in a series that examine seven-dimensional solvable Lie Algebras with a six-dimensional niradical. Low dimensional solvable Lie Algebra classification started back in 1963 by Mubarakzyanov, and was completely classified up to dimension six. A general theorem asserts that if *g* is a solvable Lie Algebra of dimension n, then the dimension of its maximum nilpotent ideal (called the nilradical) is at least *n/2*. For the seven-dimensional algebras, the nilradical's dimension could be *4*, *5*, *6* or *7*. The four and seven dimensional nilradical cases were classified. We examine the six-dimensional niradical case. We first looked for the six-dimensional nilpotent algebras and found *32* algebras. The first case was completed in 2014, and the second case was completed in 2015. In this project we focus on the class where the nilradical is isomorphic to a direct sum of the five-dimensional algebra $A_{5,1}$ and the one dimensional algebra denoted by $A_{5,1} \oplus R$.

KIRKHOF CENTER GRR 115

Wildfire Risk Assessment in Western Montana

Participants attending 9:00 AM - 10:00 AM
Presenter: Jeffrey Gardner
Mentors: Erik Nordman, Wanxiao Sun

Western Montana is a popular tourist destination: home to Glacier National Park, popular resort areas, and several large cities. The region is very mountainous and prone to wildfires. This study analyzes historical wildfire data and develops a risk assessment model based on land cover type. The USGS Federal Fire Occurrence dataset provided the historical wildfire data, and the Montana Fish, Wildlife, and Parks Department was the source of land cover data. The dataset was narrowed to include only those fires greater than 100 acres and classified as being started through natural causes. Using ArcMap, frequency analysis of wildfires by land cover type was established. A

geostatistical model was developed using Inverse Distance Weighting to generate risk assessment maps. The result shows the areas under the greatest threat of future wildfires, which may be used to focus wildfire detection activities and ensure the safety of the residents and visitors to this part of the state.

KIRKHOF CENTER GRR 116

Calcaneal Variations in Old World Primates

Participants attending 4:00 PM - 5:00 PM
Presenter: Thomas Brokaw
Mentor: Melissa Tallman

The calcaneus is a bone that plays an important role in the locomotion of primates. Variation in this bone may be correlated with primate taxonomy and locomotion. Digital models derived from laser surface and CT scans of calcanei of a variety of old world monkeys were divided by subfamily into the Ceropithecinae or Colobinae. Landmark data –which describe the overall shape of a particular bone– were collected. A generalized Procrustes analysis was performed to statistically compare the shapes. These data were analyzed by a discriminant function analysis. The analysis using a modified landmark protocol that focused on the gross size and shape of the facies showed subfamily was properly predicted 92.2% of the time. Scans of fossilized old world monkey calcanei underwent the same analysis with modified landmarks to account for damage to some specimens. These data can be used to phenetically classify the fossils to a taxonomic group as the first step in understanding evolutionary traits.

KIRKHOF CENTER GRR 117

Phage and Susceptible Bacillus Host Isolated from Soil

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Monique Allen, Helen Dukes
Mentor: Steven Hecht

Phage therapy uses bacteriophages to target and kill bacteria causing a troubling infection in a host. This shows particular promise in bacteria that exhibit extensive resistance to antibiotics. Bacteriophages were recovered from environmental samples by incubating soil in growth media, centrifuging the media, and filtering the supernatant. This filtrate was then incubated with a bacterium isolated from the same soil sample. The incubation resulted in a complete bacterial lawn, broken by plaques, which are small holes in this lawn. Plaques are caused by the bacteriophage attacking and killing bacterial cells. This project is currently observing the lethality of injecting the wax moth larvae with the isolated bacterium. Once lethality is observed, the bacteriophage will also be injected to see if it can save the host from a lethal bacterial infection. Applications include

addressing the issue of colony collapse disorder, due to the close relationship between wax moths and bee hives.

KIRKHOF CENTER GRR 118

Effects of Acute Foam Rolling on Vertical Jump Height

Participants attending 9:00 AM - 10:00 AM
Presenter: Katelyn Morris
Mentor: Justin De Sousa

This study investigated the acute effects of foam rolling of the lower extremity on vertical jump height in five recreationally active college students. The participants completed two trials in which a one step countermovement vertical jump was examined. Initially, the average of three vertical jump heights were recorded without allowing the participants to warm-up prior. Forty-eight hours later, sessions that required the subjects to foam roll the quadriceps, hamstrings, IT band, and calves were held. Each session was then succeeded by intermittent vertical jump height recordings. Jump height significantly increased after foam rolling the lower extremity between assessments ($P < 0.05$). Moreover, it can be concluded that vertical jump height increases with acute bouts of foam rolling.

KIRKHOF CENTER GRR 119

Consanguinity Negatively Affects Scholastic Success

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM
Presenters: Matthew Sinclair, Kaitlyn Szostak
Mentor: Noor Ghiasvand

In spite of the established fact that consanguinity is associated with many undesirable traits, such as mental retardation and other Mendelian traits, consanguinity is still common among many human populations today. Since there is not much data indicating the negative impact of consanguinity on scholastic success among people within the range of normal IQ, we decided to explore this possibility. To this end, we measured the coefficient of inbreeding (F) in four groups of students including 68 struggling, 715 average, 664 successful, and 253 exceptionally successful from scholastic point of view. The average F for these groups were 0.0188, 0.0120, 0.0082, and 0.0053 respectively ($p=0.016$, $p=0.005$, $p<0.001$, respectively). If proven by other researchers, it is possible that such information would discourage and result in the reduction of frequency of consanguinity in human populations.

KIRKHOF CENTER GRR 120

Expanding the Scope: Demethylation Reactions with Boron Trihalides

Participants attending 1:00 PM - 2:00 PM
Presenter: Heidi Conrad
Mentors: Andrew Korich, Richard Lord

Ether cleavage is a classic, organic transformation that has been around since the early 1940's. However, it wasn't until recently that the mechanism by which this reaction occurs using boron tribromide has fully been understood. We are currently examining the scope of this reaction mechanism by extending this work to other boron trihalides and substrates. In essence, does boron trichloride follow this same mechanism when cleaving anisole? Does the weaker Lewis acidity of boron trichloride affect its ability to proceed through the same mechanism as boron tribromide? Can this same three cycle mechanism be applied to the demethylation of methyl benzoate? We hope these results will provide further understanding of this mechanism and its potential applications to the broader scientific community.

KIRKHOF CENTER GRR 121

Boron-Silicon Exchange of Trimethylsilylarenes with BBr3: Why Do Heterocycles Shut Down the Desired Reactivity?

Participants attending 2:00 PM - 3:00 PM
Presenter: Tyler Cooley
Mentors: Andrew Korich, Richard Lord

The mechanism for boron-silicon exchange between aryltrimethylsilanes and boron tribromide was investigated using density functional theory coupled to an implicit solvation model. While boron-silicon exchange is known for some substrates, it was shut down by trimethylsilane substituted heterocycles including pyridine, thiophene, and oxazole. Our work presents insight into the successful boron-silicon exchange for aryl silanes and presents two distinct modes by which boron-silicon exchange is disabled for the heterocycles.

KIRKHOF CENTER GRR 122

Portrayal of Pregnant Women in Popular Magazine

Participants attending 9:00 AM - 10:00 AM
Presenter: Allison Ganshirt
Mentor: Ayana Weekley

With today's media influence to be thin, fit and beautiful many individuals are altering their diet and exercise routines to fit into the norms set in place by popular media figures on TV, social media and

in magazines. Pregnant women, whose bodies are so far from this ideal body shape and size, are more vulnerable to feeling the pressure to bounce back to their pre-pregnant weight. And it doesn't stop there; women who recently gave birth are expected to drop the weight they gained during pregnancy, and then some, in a very short period of time. I will analyze a minimum of 25 articles from 2005 to 2015. I will compare the types of exercises and diet tips offered in each magazine, which will highlight the expectations placed up the reader. I will also compare the language used when describing and talking about pregnancy and the experiences that follow in each magazine article. I am interested in seeing major themes that occurred across these articles.

KIRKHOF CENTER GRR 123

Measuring DNS Amplification Attack Potential

Participants attending 1:00 PM - 2:00 PM
Presenter: Lawrence O'Boyle
Mentor: Andrew Kalafut

DNS amplification is commonly used in DDoS attacks to increase the amount of network traffic directed towards the victims. These attacks can cause large disruptions to normal network traffic, negatively impacting the target's Internet presence. In this work, we measure the potential degree of amplification by issuing millions of DNS queries and comparing the sizes of the responses to the sizes of the queries. Specifically, we measure the amplification available from every domain name in hundreds of top level domains using multiple query types. Further, we also extrapolate future amplification potential by adjusting the responses to reflect full deployment of modern Internet protocols.

KIRKHOF CENTER GRR 124

Monitoring of Chemical Deicer Impact on Surface and Groundwater During Snow Melt Off Events at Allendale Middle School, Michigan

Participants attending 9:00 AM - 10:00 AM
Presenter: Tiffany Gentner
Mentor: Peter Riemersma

Chemical deicers are applied to paved surfaces in cold weather states in the winter to melt the ice and snow. Dissolution of this salt can add chloride to runoff that can affect local aquatic systems. I am monitoring water quality in a drainage pipe-pond-well-stream system and observe how the conductivity levels and chloride concentrations change during snowmelt and precipitation events. Studying a hydrologically connected local system helps to identify under what conditions peak chloride concentrations occur. Samples are collected periodically and daily during snow melt off events and rain. The samples are later filtered and tested in the lab for conductivity and chloride. A

previous study at this site in 2015 found peak chloride concentrations in the stream and well during early snow melt but decreased as melt off continued, probably due to dilution. Monitoring is still underway, but preliminary results from January 15, 2016 match last year's results.

KIRKHOF CENTER GRR 125

Climate Change Impact on the Everglades

Participants attending 2:00 PM - 3:00 PM
Presenter: Sara Shlaffer
Mentor: Elena Lioubimtseva

Climate change has a major impact on the Florida Everglades. Everglades are unique with its environment in that it has a low elevation with a subtropical climate. Due to sea level rise, caused by climate change, salinization of the groundwater and the soils occurs in the Everglades, which has a negative impact because the environment thrives off freshwater. This has a large impact on the biodiversity and sensitivity of the habitats. This environment also relies on a surplus of inflow of freshwater, with current droughts; this impacts the biodiversity's long-term survival. Analysis of climate change scenarios generated by the AOGCMs under different climate policy scenarios and environmental data will provide the new insights on the future of Everglades.

KIRKHOF CENTER GRR 126

Climate Change and Central American Coffee Production

Participants attending 9:00 AM - 10:00 AM
Presenter: Claire LeFebre
Mentor: Elena Lioubimtseva

The effects of climate change are expected to be particularly damaging for populations relying on subsistence agriculture in developing nations. In Central America, coffee produced by subsistence farmers is an integral part of local economies, but is also particularly sensitive to climate variation. The goal of this research is to explore the possible effects of current and future climate variation on small scale coffee agriculture in Central America, and to identify the possible human and environmental impacts of changes in coffee production. Using climate modeling software, various climate models are developed to simulate probable climate change scenarios for Central America. These climate models, along with data from the IPCC Fifth Assessment Report (AR5) and existing research, are used to assess the potential implications of climate change for the millions of small scale farmers and rich ecosystems dependent on coffee production.

KIRKHOF CENTER GRR 127

Molecular Dynamics Explorations of BshC, an Enzyme Important in Drug Resistance

Participants attending 10:00 AM - 11:00 AM
Presenter: Luke Jackson
Mentors: Paul Cook, Mary Karpen

BshC is an enzyme involved in bacillithiol production among select Gram-positive bacteria. Bacillithiol is an essential molecule used by these bacteria to render the fosfomycin antibiotic ineffective. A crystal structure of BshC reveals its catalytic domain is attached to a unique coiled-coil dimer region. ADP was found at the junction between the catalytic and coiled-coil domains. To explore the possible roles of this unique structure, we simulated a truncated version of the BshC dimer, solvated in water to mimic its natural environment. Hinging between the coiled-coil and catalytic domains was observed via computational molecular dynamics. The dynamics of three models were compared: BshC without a hinge ligand, with ADP in the hinge region, and with ATP in the hinge region. We also explore possible active site substrate and product complexes. These comparisons and active site models should provide better understanding of the movement and function of the enzyme as a whole.

KIRKHOF CENTER GRR 128

Temperature Dependence of Specific Heat of Silicon Above Room Temperature

Participants attending 11:00 AM - 12:00 PM
Presenter: Luke Albertson
Mentor: Harold Schnyders

The temperature dependence of specific heat capacity in materials has been known of for many years and has been modeled by both Albert Einstein (1907) and Peter Debye (1912). This phenomenon is often difficult to view as it occurs either far below room temperature (298 K) or gradually over so wide a range of temperatures as to be ignorable in many experimental situations. This study analyzes the heat capacity of undoped Silicon crystal in a range of temperatures from 300 K to 750 K using a 3-ω AC technique utilizing a sputtered Gold-Palladium resistor as the heating element and thermometer.

KIRKHOF CENTER GRR 129

A Comparison of Aerobic Fitness Levels in College Soccer Players of Different Playing Position

Participants attending 9:00 AM - 10:00 AM
Presenters: Desirae Bird, Jordan Van De Kraats, Julian Wilson
Mentor: Justin De Sousa

The purpose of this study was to compare the aerobic fitness levels of college soccer players in different playing position. Six male, college-aged (20.6 ± .5 years), Grand Valley State University club soccer players participated in this study. Before the completion of testing, all participants had their anthropometrics measured and were determined to be free of injury. Each participant completed a graded exercise test on a treadmill to volitional fatigue. During testing, expired respiratory gases were analyzed in order to determine peak oxygen consumption (VO_{2peak} in $mL \cdot kg^{-1} \cdot min^{-1}$). A one-way ANOVA revealed no significant differences in the aerobic fitness levels of defenders (56.8 ± 4.31 $ml \cdot kg^{-1} \cdot min^{-1}$), midfielders (46.5 ± 2.76 $mL \cdot kg^{-1} \cdot min^{-1}$), and attackers (55.5 ± 4.52 $mL \cdot kg^{-1} \cdot min^{-1}$). These findings suggest that the aerobic fitness levels of college soccer players are similar across different playing positions.

KIRKHOF CENTER GRR 130

Stereoelectronic Effects in the Nucleophilic Ring Opening of Phenyl Aziridines

Participants attending 9:00 AM - 10:00 AM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenter: Alexander Wong
Mentor: Matthew Hart

The structure of compounds can dictate their chemical reactivity and biological activity. The primary focus of this study is to examine the synthetic utility of various aziridine compounds during a nucleophilic ring opening reaction. By gaining a greater understanding of the regiochemical outcome of this process, it is possible to direct the synthesis of compounds in order to control the final structure. The project described herein examines the regiochemical outcome of differentially substituted phenyl aziridines. A series of compounds were synthesized and evaluated in this reaction. A correlation between the electronics of the system and the regiochemical outcome was established. This research can be applied to the synthesis of biologically relevant agents.

KIRKHOF CENTER GRR 131

Human Papillomavirus Vaccination (HPV) Education of College Women: Understanding the Relationship Between the Level of Vaccine Education and the Rate of Full-Series Vaccinations

Participants attending 9:00 AM - 10:00 AM
Presenters: Paige Stoneburner, Marlee Wolford
Mentor: Julia VanderMolen

Objective: This systematic review examines the barriers to Human Papillomavirus (HPV) vaccination in college females. Additionally, the review explores the factors affecting acceptance and adherence to the vaccine and the effects of age-appropriate education regarding the HPV vaccine. Participants/Methods: Studies identified in PubMed, CINAHL, and ProQuest Medical Library published between 2011 and 2015 were selected. Inclusions were college women aged 19 and 24, HPV, vaccine, United States, and published in a peer-reviewed journal. Fifteen peer-reviewed articles were collected. Results: Education is thought to be the primary gateway to an increased acceptance and adherence to college women receiving the HPV vaccination. Conclusions: There is a lack of research regarding HPV vaccine education and how it affects the uptake. Future research is still needed to identify additional variables that will enhance vaccine compliance.

KIRKHOF CENTER GRR 132

Fatty Acid Receptors Regulate Endothelial Cell Cx43 Expression

Participants attending 9:00 AM - 10:00 AM, 11:00 AM - 12:00 PM
Presenters: Alisha Booms, Kristen Grider, Timothy Holloway, Cornelius Scott, Amanda Stevens, Amy TenHoor
Mentor: David Kurjiaka

Recent work suggests the effects of fatty acids on human health go beyond their caloric content and involves binding to receptors. In particular, cis fatty acids bind to fatty acid (FA) receptors and elicit a G protein dependent response within the target cell. The goal of this work was to determine whether there is a dose dependency to FA responses in the endothelium. Endothelial cells are key players in the development of cardiovascular disease. We will evaluate the expression of connexin 43 (Cx43) proteins as a measured of the health of these cells: increasing Cx43 expression indicates an unhealthy endothelium. Cultured endothelial cells were treated with 18C cis FA (oleic acid at 0.3, 3, 30, and 300 μM) and the expression of Cx 43 in their cells evaluated 12 hrs later via the Western Blot technique. Previous work showed 30uM Oleic acid decreased Cx43 expression reflective of a healthier endothelium. We will present the results of these (in progress) experiments.

KIRKHOF CENTER GRR 133

Conversational Gesture in Stroke Patients with Aphasia and Apraxia

Participants attending 9:00 AM - 10:00 AM
Presenters: Cole Burkholder, Scott Thorbjornsen
Mentor: Beth Macauley

Many stroke patients lose the ability to express language and rely on gesture for expressive communication. The type of language loss following stroke, called aphasia, greatly impacts the number and type of gestures produced by the person. A person with fluent aphasia tends to produce fewer gestures than a person with non-fluent aphasia. However, apraxia frequently co-occurs with aphasia. Apraxia is a disorder of gesture production. The purpose of this study was to investigate the relationship between type of aphasia, and severity of apraxia on gesture production in stroke patients with aphasia. It is hypothesized that severity of apraxia trumps type of aphasia and therefore has a negative impact on the person's ability to communicate effectively.

KIRKHOF CENTER GRR 134

The Antibiotic Potential of Diphenylureas

Participants attending 1:00 PM - 2:00 PM
Presenter: Kelsie Nauta
Mentor: Matthew Hart

Antibiotic resistance is developing at an increasing rate and has fueled the need for the development of new antibiotics. Linezolid is an antibiotic that specifically targets bacterial ribosomes, permitting its use in treating infections without interfering with host protein synthesis. However, new linezolid resistant strains of bacteria have evolved. Diphenylureas were synthesized and tested against *Staphylococcus aureus* and *Escherichia coli* for their potential as novel antibiotics. Since the chemical structure of diphenylureas is similar to linezolid, these novel structures may interact with the bacterial ribosome and prevent bacterial translation. The diphenylureas were evaluated by measuring the zones of inhibition measured from disk diffusion tests and minimum inhibitory concentration tests, which determine the lowest concentration at which the chemical of interest is inhibiting bacterial growth. These results will inform the next generation of potential antibiotics.

KIRKHOF CENTER GRR 135

Examination of Student Use of Screencasts and Simulations for Learning About Solubility

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 1:00 PM - 2:00 PM
Presenters: Marissa Biesbrock, Dena Warren
Mentors: Deborah Herrington, Jessica VandenPlas

To assist chemistry students in learning general chemistry concepts, several simulations and screencasts have been developed. Simulations allow the student to independently interact with a program and control variables, while screencasts are instructor-led videos that the student can view. Research shows that both simulations and screencasts have improved student learning; however, there isn't much research on how students use these tools on their own. This project seeks to understand how students interact with simulations and screencasts by presenting data from student use of the PhET Solubility simulation and a matching screencast. Quantitative and qualitative analysis of student responses to an assignment and follow-up questions will be presented. Eye-tracking data, measuring students' attention while viewing the screencast and simulation, will also be presented. This data will highlight the differences between student use of simulations and guided screencasts led by an instructor.

KIRKHOF CENTER GRR 136

Synthesis and Characterization of Diphenyl(2-methoxyphenyl)phosphine Chalcogenides

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM
Presenters: Evan Christoffersen, Alan Lear
Mentors: John Bender, Shannon Biros

Rising energy demands and a high dependence on finite amounts of fossil fuels are currently a major concern. As a viable alternative to carbon based power sources, nuclear fuel generates vast amounts of energy and is becoming more widely utilized. However, the hazardous waste produced can have serious and long-lived environmental consequences. The goal of our research group is to design multidentate phosphorous-based ligands for selective f-element extraction from high-level nuclear waste. Sequestration of these heavy metals will not only decrease the volume of nuclear waste, but could also allow for recycling of spent nuclear fuel. Several new ligands have been successfully synthesized and characterized via IR, NMR, elemental analysis, and X-ray crystallography.

KIRKHOF CENTER GRR 137

Isolation of 6-Gingerol from Ginger Root and the Synthesis of Major

Metabolites, 6-gingerdiols
Participants attending 3:00 PM - 4:00 PM
Presenter: Emily McGuffie
Mentor: Dalila Kovacs

6-gingerol is the most abundant compound in ginger. It is metabolized in the body to 6-gingerdiols, found to have murine tumor reducing properties which, could be applied to human tumors. The *ex vivo* synthesis of 6-gingerdiols is attempted here to allow characterizations of these gingerol metabolites. Extraction of 6-gingerol from ginger rhizome is difficult hence, few have tackled the extraction, isolation, and hydrogenation of 6-gingerol. CO_2 fluid extraction and stirring at ambient temperature were used for extraction. 6-gingerol was isolated from the ginger oil extract through silica gel column chromatography or by mixing the ginger oil with silica gel through mechanical stirring followed by filtration. 2-heptanone a model compound, was used for hydrogenation attempts. Reactions with hydrogen gas and palladium on charcoal or Raney nickel were performed to mimic hydrogenation of 6-gingerol. To produce 6-gingerdiol metabolites chiral catalyst will be used for hydrogenation.

KIRKHOF CENTER GRR 138

Improving Refugee Cultural Orientation Curriculum: An Engaged Partnership and Service Project

Participants attending 9:00 AM - 10:00 AM, 10:00 AM - 11:00 AM, 1:00 PM - 2:00 PM
Presenters: Katherine Deremer, Marc Lehman, Kari McGuire, Julia Wilkinson
Mentors: Russell Rhoads, Michael Wroblewski

The Anthropology Department (GVSU) is partnering with the Bethany Refugees and Immigration Services, in order to assess and improve the Joint Cultural Orientation class and curriculum offered to newly-arrived refugee clients. The program helps newly arrived refugees adjust to a new life, focusing on habitation and service delivery. This service project entails a joint effort between students in two anthropology courses and Bethany staff, presenters and interpreters to co-generate recommendations on the JCO for mutual benefit. The findings include designing video curriculum, a review of best practices for cultural orientation, recommendations on improving communication and delivery of resources and information, and a comprehensive evaluation report. The project concluded with a student-organized discussion forum of all stakeholders to discuss the findings and plan action for the future of cultural orientation services.

KIRKHOF CENTER GRR 139

Do Our Children Have Their Own Mind? A Study on Maternal Mind-Mindedness

Participants attending 2:00 PM - 3:00 PM, 3:00 PM - 4:00 PM
Presenters: Bria Atkins, Abigail Cousino
Mentors: Naomi J. Aldrich, Jing Chen

Maternal mind-mindedness (MMM) is defined as a mother's ability to attune to a child's mental state and regard the child as a thinking being rather than just a necessitous person (Meins, 1998). Research has shown that higher MMM scores were associated with secure attachment and better mental and symbolic performance in children. In this study, we analyzed data collected from a sample enrolled in a county-wide developmental screening program offered by a non-profit organization in GR. MMM was measured using mothers' descriptions of their children. Our results showed that MMM scores positively correlated with the number of screenings that the mothers have completed but not the age of the child. Mother's education was marginally correlated with MMM scores, whereas family income, size, and ethnicity did not seem to influence MMM. Our findings may provide important information in evaluating the effectiveness and benefits of this kind of community-based developmental program.

KIRKHOF CENTER GRR 140

A Study of Ice Fluctuations and Climatic Influence on Lake Michigan During the 2013-2014 Winter Season

Participants attending 9:00 AM - 10:00 AM
Presenters: Tani Richter, Timothy Walters
Mentor: Kin Ma

Great Lakes ice extent fluctuations are of interest in this era of climate change. Ice growth, melt, and consistent ice cover are influenced by daily, weekly, monthly and annual changes in climate. From available data in climate records, this study focuses on a bi-weekly climate data for ten cities located on the perimeter of Lake Michigan of the 2013-2014 winter season. This selection is paired with ice cover records for the sampled time periods provided by the NOAA. The ice cover datasets were rendered using the ArcGIS 10.1 program to display ice fluctuations, and the selected climate data. Ice fluctuation and temperature were measured by constructing a bivariate scatterplot for the mean values of temperature and percent ice concentration for the sampled period of time. Observations of ice fluctuation due to wind direction, low/high pressure systems, and short term changes in temperature will be shown.

KIRKHOF CENTER GRR 141

Gridline Graphs in Higher Dimensions

Participants attending 9:00 AM - 10:00 AM
Presenters: Jacob Adams, Susanna Lange
Mentor: Feryal Alayont

Graph theory is the field of mathematics dealing with graphs used in modeling relationships between objects. In a graph, objects are represented as vertices and the relationships between them are represented by lines. We focus on gridline graphs, which are graphs whose vertices can be labeled with *x*, *y* coordinates so that two vertices are connected when they share either an *x* or *y* coordinate. In this presentation, we generalize the definition of two-dimensional gridline graphs to three and higher dimensions. Additionally, we characterize a category of graphs which cannot be represented as gridline graphs in three dimensions, and investigate families of forbidden graphs in three and higher dimensions.

KIRKHOF CENTER GRR 142

Identifying O_2-sensing Regulators for *E. coli* Biofilm Formation via Transposon Mutagenesis

Participants attending 9:00 AM - 10:00 AM, 11:00 AM - 12:00 PM
Presenters: Adam Pickrum, Steven Wilkinson, Shaowen Xu
Mentor: M. Aaron Baxter

Biofilms are complex structures produced by bacteria to colonize surfaces, digest substrates, and resist harmful environments. Bacterial cells in biofilms undergo tremendous physiological changes compared to planktonic cells. Within the 3D structure, bacteria at different locations will express diverse genes, leading to a distribution of functions. To achieve a functional biofilm, regulation is important, since each bacterium needs to know its own role in the biofilm and recognize environmental changes. Cues that are detected by these regulators include pH, O_2, temperature, and other signaling molecules. Our lab is investigating whether O_2 levels plays a role in biofilm development. An E. coli library is being created via transposon mutagenesis. These mutants are grown under aerobic, microaerophilic, and anaerobic conditions. The effects these O_2 conditions have on biofilm production are then quantified. Mutants that show variations in biofilm levels will be saved for further study.

KIRKHOF CENTER GRR 143

Typosquatting

Participants attending 9:00 AM - 10:00 AM
Presenter: Joshua Engelsma
Mentor: Andrew Kalafut

Typosquatting is the practice of registering domains very similar to legitimate domains with hopes that people will land on the aforementioned domain via a typo. Typo domains are used maliciously to park ads and phish information from users. Defensive typo registrations are made by the owners of genuine web sites to prevent exploitation of users trying to access the legitimate site. Our research aims at quantifying the extent to which typosquatting occurs and to determine the actual cost of defending one's site. While previous research has focused predominantly on quantifying typosquatting within the .com top level domain or amongst the more popular .com sites, our research looks more broadly across most general top level domains – approximately 400, (including .net, .org, .biz, .mobi, and .name). Our research also looks across a larger spectrum of .com domains. Examining typosquatting across all top level domains will give us a superior view of the true cost of typosquatting.

KIRKHOF CENTER GRR 144

Impacts of Climate Change on Orange Crops

Participants attending 9:00 AM - 10:00 AM
Presenter: Dexter Larabee
Mentor: Elena Lioubimtseva

This study investigates the impacts climate change has, and will continue to have, on Orange crops in the State of Florida – southeastern portion of North America. Data on my presentation has been collected and analyzed to prove that climate change has indeed taken a toll on oranges: This includes their size, nutrition content, vitamin C levels, color, etc. This research also covers the economic impact climate change has on the orange industry – the fluctuation in sales worldwide as a result and the ripple effect that has on the State of Florida.

KIRKHOF CENTER GRR 145

Characterization of a Drug for Alzheimer's Disease in a 'Retina in a Dish' Culture System for Glaucoma.

Participants attending 10:00 AM - 11:00 AM, 12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM
Presenters: Audrey Bracken, Taylar Dickson, Raven Goodwin, Arielle Lochrie, Grace Peterson, Lindsey Schroedter
Mentor: David Linn

It is known that activation of nicotinic ACh receptors (nAChRs) on retinal ganglion cells (RGCs) could provide neuroprotection from neurodegenerative diseases like glaucoma. Theoretically, increasing released ACh should activate more nAChRs, increasing neuroprotection. DMP 543 was developed to enhance release of ACh in the brain to treat Alzheimer's disease. Previously, we determined a dose-dependent release of ACh from the pig retina in an intact eye-cup preparation and effects in a dissociated retinal cell culture ('retina in a dish'). We wanted to determine if this retinal culture model including cholinergic amacrine cells and RGCs could indirectly demonstrate the release of ACh as measured by increased cell survival. Currently, we are testing the effects of selective nAChRs modulators (PAMs), which should enhance activated nAChR response(s), to confirm a direct effect upon nAChRs. These results could indicate which specific nAChRs are activated by the ACh released due to DMP 543.

KIRKHOF CENTER GRR 146

Effects of Climate Change on Hurricanes in the North Atlantic and Gulf of Mexico

Participants attending 11:00 AM - 12:00 PM
Presenter: Chantelle Ash
Mentor: Elena Lioubimtseva

My research project examines how climate change affects the intensity and frequency of hurricanes that occur in the North Atlantic and Gulf of Mexico region. Research though scholarly literature, climate change data, and climate models will help me determine if there is a pattern with sea temperature change and hurricanes. I will create climate change scenarios, analyze temperature trends, and determine if hurricanes are becoming more prevalent and common.

KIRKHOF CENTER GRR 147

Pediatric Cerebral Malaria: A Retrospective Study in Apam, Ghana

Participants attending 2:00 PM - 3:00 PM

Presenter: Emily Macauley

Mentor: Beth Macauley

In sub-Saharan Africa, pediatric cerebral malaria is associated with a high mortality rate. Presented is a brief discussion of the disease followed by a retrospective analysis of 26 children presenting with cerebral malaria symptoms admitted to a level C hospital in Apam, Ghana between January and July of 2015. It was found that Quinine was the anti-malarial of choice and the fatality rate was 14% lower than the accepted World Health Organization (WHO) average. Multiple confounding diagnoses, such as bacterial meningitis and anemia, lead to complicated treatment regimens. Further development in pathology, risk factors, diagnostic techniques, and treatment protocols would potentially provide improved overall outcomes.

Oral Presentations, Abstracts & Schedule

Beginning at 9:00 AM

KIRKHOF CENTER 1104

Campfire Regulation in Wilderness Areas

Presenter: Jennifer Scholl
Mentor: Carol Griffin

According to the Wilderness Act of 1964, wilderness areas must have outstanding opportunities for solitude, or a primitive and unconfined recreation. National Park Service, Bureau of Land Management, and United States Forest Service manage their wilderness based on the Wilderness Act's guidelines. The purpose of this research is to analyze campfire regulations within wilderness areas managed by the National Park Service, Bureau of Land Management, and United States Forest Service to examine where it falls on the continuum of unconfined recreation. To analyze campfire rules and regulations within wilderness areas, each rule and regulation will be classified under campfire related variables. These variables will be collected from all three agencies and assigned a weighted score which relates to the restrictiveness of the rule. All weighted rules will be analyzed and examined to see where campfire rules and regulations sit on the continuum of unconfined recreation.

KIRKHOF CENTER 1142

Forest Management Plan

Presenter: Christopher Walters
Mentor: Erik Nordman

Picture for a second, a pine stand, you are standing underneath the canopy of red pine and there are no shrubs in sight. Now picture standing under a pine stand that is full of shrubs and dead standing trees. This is the condition of the pine stand and the Rozeboom's family property. Managing land is key to good health of an ecosystem and this piece of land is not healthy. What is the best way to be reclaiming this piece of land? Pine stands respond really well to fire, a management plan of felling the dead standing trees and a backing fire to reduce the shrubs and the pine duff. Bringing this pine stand back to a natural state will be the primary goal of this area.

KIRKHOF CENTER 2201

An Inexpensive Two-Dimensional Infrared Spectrometer for Reaction Monitoring

Presenter: Jacob Lindale
Mentor: Dalila Kovacs

Insight into reaction mechanisms provides tools for controlling and predicting their outcome. For this type of study, the instruments must be able to monitor very rapid physical and chemical changes at high resolution. While such instruments exist, they are often quite expensive and require specialized training to operate. Here we report the construction and use of an inexpensive two-dimensional infrared spectrometer that monitors reactions using a step-scan pump probe geometry and can record data on the microsecond time scale. Oxidative polymerizations were followed to demonstrate the instrument's potential for reaction monitoring. Furthermore, the design of the spectrometer and experimental parameters have been compiled in a way that is accessible to students learning about parameters have been compiled in a way that is accessible to students learning about analytical instrumentation and spectroscopic methods.

KIRKHOF CENTER 2215

The Therapeutic Use of Dance with Older Adults who have Dementia

Presenters: Kellisha Bewley, Maria Garcia
Mentor: Dawn De Vries

The purpose of this review was to examine the outcomes of the therapeutic use of dance with older adults who have dementia. Effectiveness of this intervention will be explained as well as the best way for caregivers, therapists, and leaders to implement the therapeutic use of dance with older adults who have dementia.

KIRKHOF CENTER 2263

Patterns of Neutral Genetic Variation in the Virginia Big-eared Bat

Presenter: Jennifer Grousd
Mentor: Amy Russell

Genetic diversity is an important contributor to the fitness of a species allowing for adaptation to changing environments or emerging diseases. Neutrally evolving microsatellite markers allow for the assessment of recent changes in diversity due to their high mutation rate. Effective population size (N_e), a parameter that reflects a population's rate of genetic drift, can be used to estimate historical events such as bottlenecks. White-nose syndrome (WNS), first detected in North America in 2006, has caused severe population declines in several species of hibernating bats. However,

the Virginia big-eared bat, seems to be unaffected by this disease and has been increasing in population size. The coalescent-based extended Bayesian skyline plot (EBSP) can determine historical N_e values and previous population size changes. By using frequency-based diversity measures and EBSP analyses, we have characterized recent changes in population size of the Virginia big-eared bat.

KIRKHOF CENTER 2266

Persistence of Spotted Knapweed (*Centaurea stoebe* L.) in Restored Native Plant Communities at the Bass River Recreation Area, Ottawa County, Michigan

Presenter: Kaitlyn Emelander
Mentor: Neil MacDonald

Invasive species, such as spotted knapweed (*Centaurea stoebe* L.), impose a huge threat for the reestablishment of native plant communities across the Midwestern United States. The effects of site preparation treatments, hand-pulling and burning on knapweed densities have been studied in the Bass River Recreation Area, Ottawa County, MI since 2009. Seedbank, seedling, juvenile and adult knapweed were sampled in 2015. The effects of experimental treatments varied between life stages of knapweed, but all treatments reduced seedling, juvenile and mature knapweed densities in comparison to adjacent untreated plots. Burning and hand-pulling treatments significantly decreased adult densities, but only hand-pulling had significant impacts on the seedbank, seedling and juvenile life stages. Burning effects have been slow to develop, and it is likely that continued burning treatments will also decrease knapweed densities at all life stages and encourage the growth of native vegetation.

KIRKHOF CENTER 2270

The Erasure of Black Women from HIV/AIDS policy

Presenters: Andrew Collier, Brad Hieftje
Mentor: Ayana Weekley

Currently Black Women are the most disproportionately affected people in the United States in regard to level of HIV/AIDS infections. One of the potential causes for this may be that Black Women are largely underrepresented in conversations around HIV/AIDS policy. Through a policy discourse analysis of senate hearings from 2005 to 2010 rooted in intersectionality, we hope to highlight this erasure in order to better serve Black Women in the epidemic in both the global and domestic contexts.

Beginning at 9:30 AM

KIRKHOF CENTER 1104

Dynamic Living: An Assessment of Resource Consumption in Grand Rapids, MI

Presenter: Hannah Mico
Mentor: Carol Griffin

Resource consumption in urban areas is an issue that has caused many socioeconomic problems; however, mitigating the effects of these issues is possible. Using computer-based models to project population patterns, natural resource consumption, and waste outputs could help prepare urban centers for surges of growth and periods of decline. Data from the U.S. Census Bureau and Grand Rapids City Departments can be used to create comprehensive models of the ways people consume resources, as well as assess policy changes to manipulate relevant outputs related to consumption. Expected results from these models include estimated carbon emissions from energy use, water consumption patterns, average waste outputs, and ways to incorporate “green” policy. Effective local legislation can aid people in minimizing household outputs, resulting in less of an environmental impact from residential areas in the long run.

KIRKHOF CENTER 1142

Assessment of Feral Cat Management: Trap-Neuter-Return Project in Grand Junction, Michigan

Presenter: Gabrielle Dhaseleer
Mentor: Erik Nordman

Feral cat populations have increased drastically in previous decades, largely due to human involvement and rapid reproduction rates. This has caused unsustainable population rates, leading to an increase in disease spread, predation of local songbirds and small mammals, as well as becoming a ‘menace’ species in areas of large human populations. There have been many proposed management plans that have been utilized throughout the world, from euthanasia, to no management. This project uses Trap-Neuter-Return (TNR) management in one specific colony located in Grand Junction, Michigan. The project’s goal is to achieve a 100% sterilization rate, and relocate any social cats into a home. The colony will remain on the property, cared for by a caretaker, and be assessed yearly to determine the overall health and size of the colony.

KIRKHOF CENTER 2201

Statistical Analysis of Donation Data from the GVSU University Development Department

Presenters: Sara Andrasik, Marie Griffith
Mentors: John Gabrosek, Jarrett Martus

During this statistical consulting experience, we were given the task of finding trends in the data of past and present donors. Data was provided by Jarrett Martus and the University Development department at GVSU. The data was collected on the donations of over 100,000 alumni. The overall objective was to determine who is most likely to donate for the first time, donate repeatedly, or increase their donation. The resulting analysis will assist the University Development department in focusing their efforts to contact those who will be most likely to donate to their alma mater.

KIRKHOF CENTER 2215

Recreational Therapy with Individuals Who Have Been Sex Trafficked

Presenters: Alyvia Aernouts, Jael Pepper, Karlee Rigterink, Allison Shoemaker
Mentor: Dawn De Vries

This presentation will cover in detail the benefits of the use of therapeutic recreation in the treatment for women who have been victims of sexual trafficking.

KIRKHOF CENTER 2263

A New and Changing Decade: Women's Fashion of the 1830s

Presenter: Jennie DeVries
Mentor: Douglas Montagna

Using a blend of period magazines, and online museum collections, the 1830s was revealed to be beautifully complex in terms of women's fashion. Focusing on the technology that came to full fruition in the late 1820s and early 1830s, the textile industry boomed creating a wealth of new materials for women to choose from in creating their unique looks. Through romanticism, fashion took on a new dimension becoming an expression of exotic and elaborate fantasy that appeared in both clothes and hairstyling. The link uniting women to these new trends were fashion plates and magazines that enabled women to discover and implement these new looks into their wardrobe making the 1830s a decade that was truly unique.

KIRKHOF CENTER 2266

Perceived Social Support and Mental Health

Presenter: Sultan Hubbard
Mentor: Brian Lakey

This current replication of Lakey, Vander Molen, Fles, & Andrews (in press) seeks to test the predictions of Relational Regulation Theory (RRT). RRT hypothesizes that perceived support and affect simultaneously emerge through ordinary social interactions rather than through enacted support. RRT also predicts that perceived support and a recipient's affect regulation is strongly relational. In the current study, an existing data set was utilized in which 10 is strongly relational. In the current study, an existing data set was utilized in which 10 groups of 4 roommates (40 recipients, 40 providers, and 120 dyads) completed a round robin assessment. Each roommate rated his/her respective roommates on supportiveness, quality of conversation, similarity to herself, and affect when with the roommate. As predicted by RRT, perceived support and ordinary conversation were primarily relational. Moreover, relational perceived support and ordinary conversation were correlated with relational, high positive affect, perceived similarity, and low negative affect.

KIRKHOF CENTER 2270

The AML Account: An Overview of Acute Myeloid Leukemia

Presenter: Ryan Durkee
Mentor: Bruce Ostrow

Acute myeloid leukemia is a rare disease that is estimated to have 20,830 new cases in the U.S. Like any disease it is important to gain better insight and knowledge. This presentation will assist in this goal by providing a synopsis of the information covered in my previously completed research paper on acute myeloid leukemia. The presentation will cover a brief history, the pathophysiology, the epidemiology, and the different treatments of acute myeloid leukemia. The objective of this presentation is to foster awareness and understanding of the disease acute myeloid leukemia and the patients that suffer from this disease.

Beginning at 10:00 AM

KIRKHOF CENTER 1104

A Review: Effects of Anthropogenic Ocean Noise on Cetaceans

Presenter: Shanell Hodges
Mentor: Carol Griffin

Over the past decade, technological advances have caused an increase in overseas shipping, underwater oil exploration, and ocean recreation, which are contributing to ambient anthropogenic ocean noise. The increased levels of noise are causing stress on the marine environment and interfering with marine cetaceans' ability to communicate, forage, and navigate. Reflected sound is key to the survival of marine mammals because it is crucial for echolocation. Underwater noise pollution masks and diverts the natural sounds and clicks created by these mammals causing adverse health problems, deviation from natural migration paths, and starvation. Literature will be synthesized and examined from the past ten years to implement technologies and methods that will reduce ambient underwater noise created by humans. This research will be important to conservation biologists because it could promote marine mammal protection plans and generate new technologies to reduce anthropogenic ocean noise.

KIRKHOF CENTER 1142

Adaptive Management Plan for Sustainable Alewife Populations Based on the Stocking of Chinook Salmon

Presenter: Nicholas Everse
Mentor: Erik Nordman

The Lake Michigan alewife (*Alosa pseudoharengus*) populations are dwindling at an alarming rate. Their populations are declining rapidly due to a variety of different pressures, including being the main prey species for the chinook salmon (*Oncorhynchus tshawytscha*); which are fish stocked by the Michigan Department of Natural Resources. I designed an adaptive management plan that assessed the current alewife populations and suggested changes in the amount of salmon stocked each year. The plan is to further decrease the stocking of salmon until alewife populations have a chance to rebound. By observing trawling data and sonar scans, we will be able to monitor the biomass of the alewives in Lake Michigan to determine the success of the plan. My plan will be adapted for implementation in other states. This project is of the upmost importance because the alewife is a huge part of the Lake Michigan ecosystem and is a food source for many species in the lake.

KIRKHOF CENTER 2201

The Evolution of Military Systems during the Hundred Years War

Presenter: Taylor Lewis
Mentor: James Smither

My research focuses on the evolution of the French military system during the reign of Charles V. It was during this period that the French adopted a military system based on paid, professional soldiers. These changes in military doctrine are indicative of the early modern military revolution.

KIRKHOF CENTER 2215

Outcomes of Wilderness Therapy for Adolescents with Mental Health Diagnoses

Presenters: Rebecca Corn, Linnea Dohring, Jacqueline Palka, Alexa Rosenblat, Ann Smit
Mentor: Dawn De Vries

The purpose of this study is to explore the outcomes during and after wilderness therapy interventions. The focus is on adolescents, ages 12-17, who have a mental health diagnosis. This study highlights the interventions that produce the best outcomes characterized by the longevity of the outcomes and by the versatility of the interventions among different diagnoses. Research focus questions were: How effective is wilderness therapy on the treatment of adolescents with a mental health diagnosis? What outcomes are produced by use of wilderness therapy for adolescents with a mental health diagnosis? Does participation in wilderness therapy produce long term outcomes in adolescents with mental health diagnoses? How versatile are wilderness therapy interventions among adolescents with different mental health diagnoses?

KIRKHOF CENTER 2263

Commonality Within World Creation Myths

Presenter: Parryss Carter-Mcgee
Mentor: Sheldon Kopperl

The term Myth has a bad reputation for being used to describe stories that are considered false or supernatural. Yet a myth is not necessarily a false story, but a narrative, describing the interactions between the supernatural and the natural. Myths are often used to reflect the views a population may have of themselves and the world around them. Myths also play a part in describing how a population came to inhabit the earth, how they were created, and who created them. In this discussion we will address the different types of creation myths and how these creation myths fit into the categories, explore past and present creation myths of various populations from different geographical areas, as well as compare the creation myths to see how they are similar and

different from one another. From the comparisons, we can see how much influence creation myths have on a population and how they believe and understand the earth and themselves to have been created.

KIRKHOF CENTER 2266

Sharing Silence, Illuminating Invisibility: The Haunting Experiences, Voices and Identities Within 20th and 21st Century Lesbian Literature

Presenter: Kanyn Doan
Mentor: Danielle DeMuth

In the case of queer literature within Queer Studies, Women and Gender Studies, as well as English and Literature Studies, the genre of lesbian literature has fallen through cracks, and created gaps within representation, lived intersectional experience, and the lesbian community as an entire subculture of people. The research conducted has attempted to examine the glossing over of history and experience in relation to not only sexuality and gender, but also intersecting identities and experiences based on the socially constructed and defining identities of race, nationality, ability and socio-economic class as well. Through examination of feminist and literature courses, this specific literary research is able to provide insight into the structure and intentionality of curriculum within courses containing lesbian literature, and critically engage in the narrative of lesbians within academia.

KIRKHOF CENTER 2270

Video Games as Collegiate Instructional Tools

Presenter: David Smither
Mentor: James Smither

The presentation will center around the highlights of the paper with the same title, written by the presenter. While games are used in K-12 programs, they are rarely used in collegiate studies. The presentation will emphasize the diverse and varied uses of interactive games in college classes, focusing primarily on their use in History of Warfare, Economics, and Political Science. Examples of games, solutions to potential problems, and methods of use will all be addressed during the presentation.

Beginning at 10:30 AM

KIRKHOF CENTER 1104

Permit Requirements Throughout Wilderness Areas

Presenter: Alexander Stein
Mentor: Carol Griffin

All wilderness areas are mandated to have unconfined recreation and outstanding opportunities for solitude. This study was designed to analyze the permit systems that exist within all of the wilderness areas in the United States to determine if unconfined recreation exists within wilderness. The National Park Service, Bureau of Land Management, and the Forest Service each have various forms of permit systems, from no permit required to permits that require a fixed itinerary required. Various other permit requirements, because of ecosystem management and multiple use requirements, are placed within wilderness that still allow for unconfined recreation. These variables will be analyzed to determine their restriction on unconfined recreation. Once this information is recorded it can be weighted and a final determination will be made on how the permit system restricts unconfined recreation in wilderness.

KIRKHOF CENTER 1142

Habitat Management for Black-Capped Chickadees

Presenter: Taylor Blakely
Mentor: Erik Nordman

Black-capped chickadees are important for ecosystems because where there are chickadees, other species such as woodpeckers, warblers, and nuthatches can also be found. These other species of birds will sometimes flock with the chickadees and will even recognize and take heed of their alarm calls. Therefore, it is important to manage the 11.5 acres of property my family owns in the northern lower peninsula for suitable black-bapped chickadee habitat. With a stable chickadee population there will be other bird species as well, which will provide biodiversity to the ecosystem, as well as improved aesthetics. The three objectives of this management project are to obtain the proper canopy cover percentage that allows for the best food suitability, create the proper reproduction habitat by creating more snags, and to have an increase in the black-capped chickadee population by the year 2020.

KIRKHOF CENTER 2201

An Analytical Perspective of Human Performance in Track and Field

Presenter: Marie Griffith
Mentor: Paul Stephenson

Assuming that there is a limit in human performance and that there will eventually be a threshold in world records for every track and field event, analytical techniques were used to develop a model of world records over time. The researchers examined various statistical techniques and identified the Gompertz Curve as the model of best fit for predicting the human threshold limit. This presentation demonstrates how the model performs on data for the men's and women's 100, 200, and 400 meter sprints, long jump and shot put. The researchers also completed sensitivity analysis on the performance of the model and dissected the demographics that represented the world record holders throughout the years.

KIRKHOF CENTER 2215

The Effects of Animal-Assisted Therapy on Veterans and Active Military Members with Post Traumatic Stress Disorder

Presenters: Nicole Chesla, Heather Knochel, Carrie Kwekel, Nicole Thomas, Alyssa Wolfram
Mentor: Dawn De Vries

The purpose of this study is to determine the relationship between veterans and active military members with Post Traumatic Stress Disorder (PTSD) and the use of animals as a therapeutic intervention. The effectivenss of animal-assisted therapy with acitve and military veterans with PTSD will help to uncover the best practices for this intervention. This includes the type of animal used, length and frequency of the intervention, location of the intervention, and the degree of training which the animal has received.

KIRKHOF CENTER 2263

Parking Trends at GVSU - A Statistical Consulting Experience

Presenters: Megan DeRoos, Ryan Murray
Mentors: John Gabrosek, Lisa Garringer

In an effort at Grand Valley to project parking trends for the coming years, Lisa Garringer of the Department of Public Safety is aiming to report relevant permit, citation and lot usage data since 2008. As statistical consultants, we collaborated in aggregating these data from their respective sources to better facilitate the analysis of future parking needs on campus. Our presentation will highlight findings from these data and review our experience in database compilation.

KIRKHOF CENTER 2266

Exploring the Role of Emotion and Gender in Judgements of Individuals with Disabilities

Presenters: Sarah Confer, Miranda Toth
Mentor: Todd Williams

There has been very little research to explore how expressed emotion and gender relate to perceptions of individuals with disabilities. In this study, 254 college students judged a disabled or non-disabled individual who was shown expressing either a positive or negative emotion. Targets were rated on personality dimensions of extraversion, openness to experience, neuroticism, agreeableness and conscientiousness as well as overall levels of happiness. Results show a three-way interaction between gender, facial emotion and disability. Individuals judged disabled women who expressed negative facial emotion as being less extraverted, agreeable, conscientious, open and happy relative to individuals who had positive facial emotion, were non-disabled, or were male. Overall, the findings suggest that negative perceptions and stereotypes about disability exist and that disabilities are viewed as more detrimental to the perception of women's character and well being than that of men.

KIRKHOF CENTER 2270

The Inconvenience of Innocence for Traditional Answers to the Problem of Evil

Presenter: Brandon Wright
Mentor: Dwayne Tunstall

In addition to presenting an early version of his own answer to the problem of evil, Josiah Royce's essay "The Problem of Job" forcefully criticizes traditional answers to that problem. In this presentation I will make use of a hypothetical drunk-driving accident as a paradigm case for the experience of evil. This will allow me to sketch two of the traditional answers: free will theodicy and soul-making theodicy, and then put forth Royce's criticisms of those views.

Beginning at 11:00 AM

KIRKHOF CENTER 1104

American Marten (*Martes americana*) Habitat Suitability in Hartwick Pines State Park

Presenter: Amanda Hennells
Mentor: Carol Griffin

American marten (*Martes americana*) were once abundant in Michigan's mature coniferous forests. Throughout the 1870s, Michigan was logged for economic growth causing massive displacement of martens and eventually extirpation from the state entirely. A small patch of old growth white pine approximately 80 acres is located in Grayling, Michigan, and was protected in 1927 from logging and donated to the state as Hartwick Pines State Park. Analysis of Hartwick Pines State Park will be conducted and as a result the area will be ranked on a scale of 0-1 determining how suitable the study area is for martens. Analysis for suitable habitat includes: percent tree canopy closure, successional stage of the stand, and the percent ground cover. It is expected that Hartwick Pines State Park will offer suitable habitat for the American marten; however it is also expected that it will be too small to support them.

KIRKHOF CENTER 1142

Brown Trout Habitat Restoration in the Pigeon River, Ottawa County, Michigan

Presenter: Nicholas Pearce
Mentor: Erik Nordman

The Pigeon River is a small stream located in Ottawa County, Michigan that does not contain a suitable amount of in-stream habitat to support a healthy population of brown trout (*Salmo trutta*) primarily due to a lack of large woody debris content. The river currently supports a stocked brown trout population; however, there are areas within the river that need habitat improvement. The primary objective for this adaptive management plan is to restore the areas in the Pigeon River that lack suitable in-stream large woody debris content that is needed to support a healthy population of brown trout. If success is achieved due to the implementation of this management plan, outcomes will include an increase of large woody debris by 25% by August 31st, 2016, a higher level of biodiversity within the river, more visitor use of Pigeon Creek Park and Hemlock Crossing Park, and increased fishing license sales leading to increased revenue for management within the state of Michigan.

KIRKHOF CENTER 2201

How Increasing Global-Mean Temperatures Will Affect the Hydrologic Cycle of Western America's Watersheds

Presenter: Kailey Keenan-Whittemore
Mentor: Elena Lioubimtseva

Stream-flow, snow water equivalent (SWE) and seasonal precipitation in the Western American region can be analysed as indicators of increasing temperatures that cause change in the hydrologic cycle. If the global-mean temperature increases, precipitation will be affected to change from snow to rain in the winter months and increased rain in spring months. A decrease of snow accumulation in the surrounding mountains is capable of stimulating peak stream-flows to occur earlier within the season in response to snow-melt occurring earlier. To study the hydroclimatology of the mountain watersheds, I will use GIS modelling, GCM modelling, SWE and hydrological data sets to observe the effects of increasing global-mean temperatures.

KIRKHOF CENTER 2215

Benefits of Cycling for Persons with Congenital and Acquired Limb Loss

Presenters: Abigail Barnes, Christina Canepa, Alese Garstick, Marissa Hill, Kailey Roberts
Mentor: Dawn De Vries

The intent of the study is to determine the effectiveness and benefits of cycling directed at individuals with congenital limb differences (CLD) and/or acquired amputations. This study will explore how the use of adapted cycling can improve physical, social, emotional benefits for individuals' ages four years old and above. The evidence concluded from this study will in turn reveal the importance of the implementation of cycling as an intervention in the recovery process for individuals with CLD or acquired limb amputation.

KIRKHOF CENTER 2263

Behind the Veil: A Feminist Analysis of Christianity and Islam in Relation to Historical and Cultural Forces of Gender

Presenter: Amanda Sackett
Mentor: Danielle DeMuth

The focus of this research is to explore Islam and Christianity from a feminist perspective; examining the overlaps between the two religions, as well as the cultural divergences. I will explore how these religions ideologically create feminism within their cultures; examining this feminism through a gendered genealogical analysis of religion, tracing ways that feminist scholarship has morphed over time. A genealogical analysis will allow for the exploration of this feminism,

calling attention to the necessity for awareness of the historical and political underpinnings of feminist theory. Readers will gain a sense of feminist cross-cultural insight into the interconnected complexity of religion and culture. In turn, readers will comprehend that Islam and Christianity, through their similarities and differences, are not intrinsically oppositional to one another, as they gain a deeper understanding of the historical and modern contexts and interpretations of religious feminism.

KIRKHOF CENTER 2266

Self-Assessment of Bachelor of Social Work Students' Religiosity, Competence, and Experiences

Presenter: Shelby Bruseloff
Mentor: Brandon Youker

The Council on Social Work Education mandates all accredited social work programs teach students about cultural competency which includes religious pluralism. However, prior assessments by GVSU School of Social Work found that only 24% of bachelor's students feel that they received adequate instruction on religion and/or spirituality. This presentation describes the findings from a group administered assessment of students enrolled in GVSU's Bachelor of Social Work program in the 2016 winter semester. The 16-item close-ended questionnaire asks students to report their experiences with religion, experiences with and exposure to other religions, attitudes toward understanding different religions, and specific experiences with religion education while attending college. The ultimate goal of this study is to collect data that may be used to further develop competent social workers who understand and value religious pluralism.

KIRKHOF CENTER 2270

A Qualitative Ethnography of Spaces in the Performing Arts Center: Exploring Addition and Renovation Needs

Presenters: Andra Durham, Erin Wilson
Mentors: Tara Hefferan, Deana Weibel-Swanson

The Faculty Facilities Planning Advisory Committee (FFPAC) enlisted the help of three interns to complete ethnographic research in the Performing Arts Center (PAC) to identify issues faced by faculty and students of music, dance, and theater programs. Through interview, survey, and observation, we found that academic programs have outgrown the PAC in terms of space and quality of facilities. Participants expressed a need for updated performance halls, better storage, more rehearsal space and offices, reliable heating and cooling, and improved acoustics and soundproofing. Users of the PAC find creative solutions for facility-related issues, but would benefit from expansion and renovation.

Beginning at 11:30 AM

KIRKHOF CENTER 1142

Adaptive Management of Invasive Lionfish in Caribbean Coral Reef Ecosystems

Presenter: Robert Taylor
Mentor: Erik Nordman

The Indo-Pacific red lionfish species (*Pterois volitans*), introduced into Florida waters in the late 1980s, has spread rapidly throughout the Caribbean basin. The ecological reef processes that provide the balance within these ecosystems are being severely affected by lionfish. This project was initiated to identify a successful method of reducing the numbers of non-native lionfish in the biogeographic region. Locals in the coastal area have actively practiced the extirpation method or, "no bag limit" fishing/hunting in coral reef communities for the last decade. A decline in lionfish densities around coral reefs of 20% each year for the next 5 years is the goal of this project. The removal of lionfish will bring recruitment numbers of native prey fish back to a stable level for native predators, and restore the ecosystem balance.

KIRKHOF CENTER 2201

Undergraduate Nursing Interview Correlates and Outcomes: A Literature Review

Presenter: Christina Winkelman
Mentor: Susan Harrington

The purpose of this literature review is to investigate prior research related to student correlates and outcomes associated with the interview process in baccalaureate nursing school admissions. The review is being conducted to determine how performance discrepancies (as measured by GPAs and standardized tests), socioeconomic factors, ethnicity, and age correlate with interview scores in an admission process and impact this decision making. Keywords include: *interview, nursing interview, baccalaureate, admission interview, undergraduate, nursing, nursing school interview*. Several databases were searched. Data is scant in this field. However, several themes were identified: *interviewing appears to increase diversity without impacting attrition; benefits of structured interviews; indication of success in programs pre-admission science GPA*. This literature review is being used as part of an ongoing research project at Grand Valley State University.

KIRKHOF CENTER 2215

Outcomes of Therapeutic Use of Art with Individuals who have Postpartum Mood Disorders

Presenters: DeAnna Hohn, Whitney Royston, Crystal Schaible, Stephanie Sheridan, Kathryn Vincent
Mentor: Dawn De Vries

This systematic review is focused on the effects of the therapeutic use of art with mothers that have postpartum mood disorders. This report draws from secondary research; the goal of this is to discover if the therapeutic use of arts is beneficial for individuals with postpartum mood disorders. We used Grand Valley State University databases for scholarly articles published on this topic. Questions to be answered include: Does art have a positive effect on the symptoms of postpartum mood disorders? How does therapeutic use of arts prevent or effect postpartum mood disorders? What are the positive effects of therapeutic use of arts? Which functional domains does therapeutic use of arts influence? Is therapeutic use of arts as/more beneficial than medication?

KIRKHOF CENTER 2266

(Relational) Black Beauty

Presenter: Shukri Bana
Mentor: Ayana Weekley

This paper explores the construction of beauty for African women with particular consideration given to the way in which beauty is constructed to be relational. This paper will use and compare the novel *Americanah* by Chimamanda Ngozi Adichie and the short film *Yellow Fever* directed by Ngendo Mukii to look specifically at the interactions the main characters have with their hair dressers to understand responses to beauty standards constructed under global white supremacy. By reading the way in which bodies are read, this paper will look at the way beauty is constructed to be natural, artificial, aspirational, how these notions are all equally constructed and still up for question. The themes explored in this paper will attempt to answer the question how do we read bodies in a given context and how do we then assign value to said bodies.

KIRKHOF CENTER 2270

Pd/C and Ru/C-catalyzed Conversion of 5-Hydroxymethylfurfural (HMF) to Fuel Additives

Presenter: Joel Francis
Mentor: Dalila Kovacs

Major routes from sugars to liquid fuels involve furan intermediates. On Pd, 5-hydroxymethylfurfural

(HMF) can be hydrogenolyzed to 2,5-dimethylfuran (DMF), which can be further hydrogenated to 2,5-dimethyltetrahydrofuran (DMTHF). Both DMF and DMTHF are promising fuel additives, and their syntheses are of high interest. Here, we investigated HMF conversion in air, under high H2 pressure in autoclave, and in microwave conditions with different hydrogen sources. Under these conditions, Pd-catalyzed reactions generally led to reduced products of HMF while Ru-catalyzed reactions generally led to oxidized products of HMF. Neither DMF nor DMTHF were observed as products of Ru-catalyzed reactions.

Beginning at 12:00 PM

KIRKHOF CENTER 1142

Camping Near Water Sources Within Wilderness in Colorado

Presenter: Christopher Stoskopf
Mentor: Erik Nordman

Spatial analysis is a growing practice when it comes to management. In 2004, David Cole and Christopher Monz studied spatial patterns of recreation in the Wind River Mountains, Wyoming. They found that after a three year study, “the magnitude of impact varied spatially within campsites, with impact decreasing as distance from the center of the campsite increased” (Cole et. Al. 2004). Within this management plan spatial analysis will serve as the driving factor for data collection. Using ArcGIS, we will compare and contrast the percent of confined recreation within a typically non-confined recreation area (wilderness) as it relates to camping near a potable water source. The buffer zone within each wilderness being managed for is 100’ from a water source.

KIRKHOF CENTER 2201

Music Video in a New Light: The Color of Music and the Music of Color

Presenter: Gabriel Ellis
Mentor: Lee Copenhaver

Musicians, visual artists, and their audiences frequently make associations between color and music, and recent scientific research suggests that listeners relate color and music primarily through emotion. These findings have been echoed by music video scholars, who identify emotion as an important mediator between the color palettes employed in music videos and the musical characteristics of corresponding songs. In this study, we quantified the color palettes of 160 recent music videos from four popular genres and looked for correlations between video color palette and musical genre, mode, tempo, and performer gender. We also used Corpus Linguistic analyses to quantify positive emotion, negative emotion, and anger within song lyrics and compared these to video color palettes. We found that video color content is related both to musical genre and to

lyrical emotional expression, suggesting that emotion does play a role in mediating music-color relationships in music video.

KIRKHOF CENTER 2215

Recreational Therapy and Individuals Who Are Experiencing Homelessness: An Assessment of Community Homeless Shelters in Grand Rapids, Michigan

Presenter: Andrew Feenstra
Mentor: Dawn De Vries

Homelessness is a problem that everyone is familiar with. In Grand Rapids alone there ten homeless shelters offering homeless individuals food, shelter, and resources needed to survive another day. While all of these needs have to be met, there are also needs that are going unmet. Recreational Therapy (RT) aims to meet the physical, social, emotional and mental needs of those receiving services, often through the outlets of recreational and leisure opportunities. There is a huge need for individuals whom are homeless for recreation opportunities and these are shown to increase quality of life and coping skills for these individuals. This assessment provides information on what homeless shelters in Grand Rapids, MI are offering homeless individuals, as well as possibly opportunities for additional services.

KIRKHOF CENTER 2270

"They Do Not Treat Us Like Human Beings": Latino-Police Relations in 1960's Chicago

Presenter: Crisol Beliz
Mentor: David Stark

Violence seems to be an endemic problem in the United States; news and media outlets constantly report on incidents of police brutality. These news reports have garnered worldwide attention. Police departments everywhere have maintained a reputation for targeting marginalized communities, in particular African-Americans. However, despite their reputations for targeting marginalized communities, Latinos are often forgotten in the discussion of community-police relations. The Puerto-Rican community of 1960's Chicago dealt first-hand with the impact of hostile policing against the Latino population, most notably in three cases. Chicago's Latino community brought attention to their struggle with police violence. A Puerto Rican consciousness slowly emerged in the 1960s, beginning with a letter-writing campaign, then a three-day violent protest, and culminating with a coalition of activists raising their collective voices to unite the community against police brutality.

Beginning at 12:30 PM

KIRKHOF CENTER 1142

Using Macroinvertebrate Assessment Profiles to Construct a Restoration Plan for the Improvement of Water Quality within Buck Creek

Presenter: David Helder
Mentor: James Dunn

Many urban streams are threatened by impacts of urbanization such as losses to their natural riparian buffers, erosion, storm water runoff and solid wastes. I monitored aquatic macroinvertebrates to help develop an adaptive management plan for Buck Creek near Grand Rapids MI. I collected macroinvertebrate profiles using the “representative reach method” from several locations within the creek. I expect that the data will help to highlight areas of from several locations within the creek. I expect that the data will help to highlight areas of ecological concern within the creek which could benefit the most from stream restoration projects. I will continue to use biomonitoring techniques to update my management plan in order to maximize future benefits.

KIRKHOF CENTER 2201

God Bless Chocolate City and Its Vanilla Suburbs

Presenter: Cameron Saghaiepour
Mentor: Jennifer Stewart

While policies such as the Fair Housing Act, enacted as Title VIII of the Civil Rights Act of 1968, are meant to protect Blacks from discrimination in the housing market, what often goes unrecognized is racism and segregation in the United States have adapted to the new regime of political correctness and the facade of inclusivity perpetuating White dominance and the insidious apartheid that continues to corrupted American society. With first acknowledgement the problem of discrimination being a moving target, and steps to level the incredibly unequal system, maybe someday there will be no distinction between “*Chocolate City and Vanilla Suburbs*” and the unnamed apartheid as well as de facto segregation will truly be a relic of the past.

KIRKHOF CENTER 2215

Auditory Stimulation in Patients with Disorders of Consciousness: A Review of Outcomes from Using Interventions that Include Familiar Voices, Positive Communication, and Music

Presenters: Kara Karcher, Carly McBride, Jacqueline Post
Mentor: Dawn De Vries

This systematic review presents the outcomes of the use of auditory stimulation interventions in individuals of all levels of Disorders of Consciousness (DOC), commonly known as a Comatose State. Reviewing the use of auditory mediums such as familiar voices, positive communication, and therapeutic use of music will improve the practice of Therapeutic Recreation when working with patients with DOC. Due to supporting evidence, patients in a comatose state maintain the use of auditory senses longer than other functions. Outcomes from using familiar voices have been found to increase consciousness level; therapeutic use of music has been found to reduce heart rate and stabilize vital signs; positive communication can provide, but not limited to, sensory stimulation, increase motivation, and promoting relaxation and comfort. Therefore, a Certified Therapeutic Recreation Specialist (CTRS) can apply this research to help improve the quality of life in individuals with DOC.

KIRKHOF CENTER 2263

Gene expression analysis to better diagnose typhoid fever

Presenter: Sarah Brown
Mentor: Sok Kean Khoo

Typhoid fever is caused by a human-restricted pathogenic bacteria and is recognized by WHO as a global health problem. Because of ineffective diagnostics, broad spectrum antibiotics are given as treatment for all bacteremia, causing antibiotic resistance. The aim of this project is to identify genetic signatures for early-diagnostic and stratification of children with typhoid fever. Total RNA extracted from blood at acute, convalescent and recovery phases of infection were processed with gene expression microarrays. We found 179 and 175 differentially-expressed genes between infectious phases. Using q-RT PCR, data showed innate immune system genes having high expression during acute phase and decreased expression in convalescent and recovery phases. Conversely, gene expression of an adaptive immune system gene is lower in the acute phase and increased in the convalescent and recovery phases. The expression of these genes reflects the host immune response to typhoid fever.

KIRKHOF CENTER 2266

Purification and Characterization of BstA, a Bacillithiol-Dependent Transferase

Presenter: Joel Francis
Mentor: Paul Cook

Since antibiotics became mainstream in the 1940s, antibiotic-modifying enzymes have emerged as a method of resistance. One such pathway revolves around bacillithiol (BSH), a low-molecular weight thiol involved in fosfomycin resistance, as well as cellular redox chemistry. This redox chemistry is carried out in part by bacillithiol-dependent BstA, a thiol transferase whose structure and mechanism are yet to be determined. In this study, BstA was purified and characterized by enzymatic activity assay and x-ray crystallography. BstA was expressed in *E. coli* BL-21 cells, purified by Ni-NTA resin, characterized in solution with BSH, cysteine (Cys) and chlorodinitrobenzene (CDNB), and BstA was co-crystallized with BSH, Cys, CDNB, and UDP-*N*-acetylglucosamine for x-ray analysis. Early kinetic trials suggest BstA is in fact BSH-dependent, and crystallographic data could provide key insight into the mechanisms of bacillithiol-dependent resistance to fosfomycin.

KIRKHOF CENTER 2270

Loss of Protein Kinase N Affects Programmed Cell Death of Nurse Cells in *Drosophila melanogaster* During Oogenesis

Presenter: Kelsey Lammers
Mentor: Georgette Sass

In *Drosophila melanogaster*, the late stages of oogenesis are characterized by programmed cell death (PCD) of the nurse cells, which provide critical nutrients to the growing egg. We investigated how protein kinase N (Pkn) plays a role in the process of nurse cell death. Despite the previous finding that loss of Pkn correlates with changes in nurse cell actin-myosin activity, we believe this is a downstream effect of the loss of Pkn in programmed cell death visualized in late stage oogenesis. To show this, multiple ovary specific GAL4 drivers were utilized to reveal the effects from the loss of Pkn on the nurse cell PCD phenotype. The resulting GAL4 ovaries were dissected, stained for nuclei, DNA and actin filaments then visualized for PCD phenotype comparison. By pinpointing Pkn, a known Rho effector, a parallel could be drawn between the actin-myosin activity and lack of PCD interplay that may be one of the first recognizable progenitors in the cancer cascade.

Beginning at 1:00 PM

KIRKHOF CENTER 1142

Adapative Trail Managment Plan for Newly Aquired Trails by the DNR Parks & Recreation Divsion

Presenter: Matthew Hatch
Mentor: Erik Nordman

The Department of Natural Resources Parks and Recreation division provides excellent recreation opportunities for many people. However, with recreation opportunities comes certain management problems for park staff. One issue concerning park managers is the maintenance and management of trail systems. I designed an adaptive management plan that implements a new strategy to manage newly acquired trails by the DNR Parks and Recreation Division. A specialized group of rangers will be established to properly manage and maintain trails (specifically on the newly developing Iron Belle Trail). Trail treads will not exceed 24 inches. Vegetation cover will be adequate on either side of the trail. Rerouting trails will also be considered if necessary. Census reports and survey reports will be used to monitor trail conditions. This plan is important to maintain a quality trail system and can be used as a baseline for future trail management endeavors.

KIRKHOF CENTER 2215

Behavioral and Social Outcomes of Exercise for Youth with Autism

Presenters: Myles Aten, Emilie Herpick, Jason Mulder, Krista Nelson
Mentor: Dawn De Vries

A systematic review of the literature on youth with autism, and the contributions of physical activity and exercise, focusing on the social and behavioral outcomes. Autism affects a person's communication, socialization, decision making skills, and presents physical symptoms. Exercise and physical activity can be an intervention used to improve a person with autism's social and behavioral needs. Studies have concluded that physical activities can provide social involvement, improve motor coordination, and reduce stereotypical repetitive behaviors. Through specific types of physical activities and exercises, improvements in one's overall quality of life are evident.

KIRKHOF CENTER 2263

Little Influences: The Large Impact of the French Revolution on Children

Presenter: Serena Ghysels
Mentors: Ellen Adams, David Eick

Using the research of scholars such as James M. Anderson and Richard Covington as well as

various primary sources, the impact of the French Revolution on children's daily lives is explored. Aspects of life studied include care of orphans, education, and games and play, as well as the changes in the lives of the royal children. Through elaboration on each of these topics it is shown that despite children's lack of control over the situation during the French Revolution, their lives were drastically affected by the events which took place around them.

KIRKHOF CENTER 2266

The Potential Role of miRNA Regulation in *Physcomitrella patens* Tip Growth

Presenter: Brooke Prieskorn
Mentor: Margaret Dietrich

Physcomitrella patens is a model species used for tip growth studies. In higher plants, normal tip growth is critical for nutrient and water uptake via root hairs and for pollen tube growth. A *P. patens* insertional mutant has been identified which, in its filamentous tissue, produces initial cells but does not respond to cytokinin and therefore rarely produces the leafy gametophyte. Sequencing revealed that in addition to the insertion, approximately 350 base pairs of non-coding genomic sequence was deleted. The disrupted locus was found to contain both retrotransposon sequence (mostly non-autonomous) and a region of 11 bp tandem repeats. Retrotransposons have been reported to produce miRNAs that regulate surrounding genes. This suggests that the mutant phenotype is the result of a disruption in gene regulation, based in these repeated sequences. Mature miRNAs have been mapped within this locus. Further analysis of these miRNAs may reveal the mechanism responsible for the phenotype.

KIRKHOF CENTER 2270

An Analysis of a Sudoku Variation Using Partitions

Presenter: Susanna Lange
Mentor: Shelly Smith

Many people enjoy solving Sudoku puzzles, but there are other challenging and intriguing questions about Sudoku that can be studied using combinatorics, such as counting the number of possible Sudoku boards and determining when a puzzle is solvable. The variation that we are focusing on is Frame Sudoku, which places different restrictions on game play. We investigate the results of this research on Frame Sudoku, using partitions of integers. This research was conducted as part of the 2015 REU program at Grand Valley State University.

Beginning at 1:30 PM

KIRKHOF CENTER 1104

Providing a Green Future: Live Roofing for Healthier Cities

Presenter: Stephen Heyboer
Mentor: Carol Griffin

The urban footprint in today's society is comprised largely of roof cover. This vast urban land cover provides an opportunity to help address many environmental concerns. There are many ecological benefits and services provided by live roofs, compared to traditional roofing. To effectively contribute to more sustainable urban areas, traditional roofing should be modified into highly functional living architecture. Evidence suggests that the environmental benefits of live roofing in urban areas can improve air quality on a microscale, support plant biological diversity, control plant uniformity in monoculture systems, reduce energy costs, improve wildlife habitat, manage stormwater efficiently, and provide vibrant biologically useful spaces to cities. It is expected that increased awareness of live roof ecosystems through examination and research will expand implementation of this natural solution.

KIRKHOF CENTER 1142

Adapative Management for the Bobolink in Osceola-Missaukee State Game Area

Presenter: Marissa Buskard
Mentor: Erik Nordman

As humans expand out over the landscape, they often destroy habitats not even thinking about the negative consequences to wildlife. Not all species are able to thrive when changes to their habitat occur. Some are vulnerable and end up becoming threatened or extinct. Suitable habitat for grassland birds such as the bobolink is slowing disappearing causing their populations to decrease. I designed an adaptive management plan for the bobolink in the Osceola-Missaukee State Game Area. I hope to locate the areas of highest suitability in all four management units. The suitability will be based on size of open field, proximity to wooded edge and time since the grasses were burned. This project is important to get a better idea of where the bird most likely will choose to live in the game area so we can know what places to focus our management efforts.

KIRKHOF CENTER 2266

Discovering Susceptible Genes Responsible for Cancer Using Bioinformatics Analysis

Presenter: Shahrzad Eslamian
Mentor: Guenter Tusch

This study aims to identify sporadic nonsense mutations involved in breast cancers on lymphoblastoid cell lines (LCLs) from multiple-case, non-BRCA1/2 breast cancer families in order to identify additional high-risk breast cancer susceptibility genes as well as molecular signatures that differ in tumor histology. The miRNA expression profile of GSE37210 accession number was downloaded from the GEO database, which was collected by Johnson JK et al. This study attempted to use non-BRCA1/2 breast cancer families in order to identify additional high-risk breast cancer susceptibility genes. In the current study using database DAVID and KEGG, 52 mRNA were found from almost 70 significant mutation genes which have aberrant expression. DAVID was used to discover the function of genes within the modules and the Gene Ontology (GO) terms. KEGG database was used to discover the pathways of the products of these RNAs and connection to non-BRCA1/2 breast cancer.

Beginning at 2:00 PM

KIRKHOF CENTER 1104

High Intensity Prescribed Fire Effects on Carbon Loss in Coniferous Ecosystems

Presenter: Tyler Dula
Mentor: Carol Griffin

When fire dependent coniferous stands have had fire suppressed, they tend to be overgrown or degraded. Some land managers consider a high intensity fire to be the best managerial action for stands containing serotinous trees. The heat given off from an intense fire releases seeds of serotinous cones and thins the understory allowing for new germination for shade intolerant species. However, forest fires release carbon in the form of CO_2, one of the major greenhouse gasses. There is a complex tradeoff between atmospheric health and forest health, when using fire as a management tool. High intensity prescribed fire releases large amounts of CO_2, making the forest a carbon source rather than a sink. This study will focus on species of trees that are known to prefer or require high intensity fire for ecological health, such as jack pine. The literature review will assess the impacts of high intensity fire on carbon loss to determine if it is a judicious management technique.

KIRKHOF CENTER 1142

John Ball Park Duck Pond Restoration Plan

Presenter: Nathan Biolchini
Mentor: Erik Nordman

The John Ball Park Duck Pond Restoration Plan was composed using adaptive management principles, to more efficiently reach the objectives stated within. Including input from various stakeholders, as well as information collected from the site and similar scientific studies, this project describes the current ecological status of the pond, as well as proposed actions to achieve the plan's objectives. It also includes a monitoring plan, to follow the progress of the restoration and alternative actions to consider if results are not ideal.

KIRKHOF CENTER 2201

Back-and-Forth Across the Pond: A Critical Examination of the Language of Foreign Policy

Presenter: Megan Rodawold
Mentor: Thomas Walker

This interdisciplinary project examines various publications from foreign policy elite press to investigate whether or not there are substantive differences in the way American and British foreign policy analysts report on two world issues selected for their differing levels of salience: the rise of China as a global power, and the Syrian civil war and resultant refugee crisis in Europe. The two primary research questions for this study are: 1) Does the representation of the two identified world issues show variation based on national narratives? and 2) Does the level of salience of these issues to the United States and the United Kingdom affect the reporting of the foreign policy press of these two countries? Ultimately, this comparison between the political discourse of two English-speaking global powers is imperative to understanding the way culture, nationality, and political bias affect our perception of world issues.

KIRKHOF CENTER 2263

Qatar- Innovation in the Gulf

Presenter: Gabriella Patti
Mentor: Coeli Fitzpatrick

Qatar is small Arab, peninsular country found in the Arabian Gulf. Over the past 60 years, Qatar has gone from a fishing and pearl diving nation, to one of the world leaders in innovation and wealth. During November 2015, Gabriella Patti was nominated to take part in the Qatar-Malone Exchange Fellowship with the National Council on US-Arab Relations. She was part of a delegation

of 15 students and faculty members who flew to Doha, Qatar for one week. While in Doha, the group attended briefings and meetings with some of Qatar's top companies and government agencies. Through Patti's travel to both Qatar and a previous trip to Oman and the UAE in the Spring 2015, her eyes were opened to the importance of the Middle Eastern region, which extends beyond worth in oil. Her presentation will explore the innovation and change within The Gulf region, which defy modern media portrayal of the region, as well as discuss the areas where change and progress are still needed.

KIRKHOF CENTER 2266

Wrongful Conviction: Leading Factors

Presenter: Christina Herrod
Mentor: Kristine Mullendore

The criminal justice system is increasingly recognizing the societal issues created by wrongful conviction. Expert commentators estimate that in the United States, between 2.3% and 5% of prisoners are innocent. This paper examines the police interrogation tactics and their contributions to false confessions, a leading correlating factor in wrongful conviction. Understanding how wrongful conviction occurs and impacts the exonerees and their families is important for the creation of proper policies to decrease the risks of future wrongful convictions.

KIRKHOF CENTER 2270

Recreating the Roman *Imago*

Presenter: Kendall Farkas
Mentor: Charles Ham

My presentation will explore the production and function of the Roman *imago* (pl. *imagines*) or ancestor mask. This research is an extension of my final class project in LAT 350: Roman Literature and Culture (Fall 2015). *Imagines* were an integral part of the Roman aristocratic funeral procession, in which family members or actors donned death masks as part of their impersonation of a distinguished ancestor. None of these masks survive in the archaeological record, but literary descriptions of the masks provide information about their appearance and material composition. My project both attempts to reconstruct a wax *imago* and explores the function of such masks in Roman culture. Through my project I hope to bring the Roman *imago* to life.

Beginning at 2:30 PM

KIRKHOF CENTER 1104

Surface Water Flow Effect on Woody Invasive Plant Abundance in Duncan Park

Presenter: Brian Turner
Mentors: Carol Griffin, Alexandra Locher

Human disturbance is evident in many of Michigan's parks, and invasive plants are often cited as evidence. There are many ways that plants can spread. Producing a large amount of seeds, most often they spread by human disturbance, wind, water, or animals. The purpose of this research is to test the hypothesis that woody invasive species will be in greater abundance at locations with high surface flow compared to locations with low surface flow. Elevation data of Duncan Park was collected and used to project surface water flow through the park using ArcMap GIS. After analyzing this data, woody invasive plant data was collected from 10 random plots that are in areas of high and low surface flow using the quadrat method.

KIRKHOF CENTER 1142

Adaptive Management Plan for Attracting Yellow Warblers to King of the Wind Farms

Presenter: Bailey Murray
Mentor: Erik Nordman

The yellow warbler (*Dendroica petechia*) is a rather distinguishable passerine bird. This bird is easily picked out with its yellow feathers throughout its entirety, unmarked faces, and pinpoint black eyes (Allaboutbirds.org 2016). These birds enjoy habitats with an abundance of shrubs and small trees, as well as insects as their diet consists of almost solely on insects (US Fish and Wildlife Service 1982). More specifically, these passerine birds prefer edge habitat and are commonly found breeding in much of North America during the summer months (Audubon 2014). King of the Wind Farms, an equestrian boarding facility, located in Macomb Township, Michigan is home to edge habitat and riparian forests. These areas are important to preserve as habitats for species as many of them are being destructed from urbanization (McClure et al. 2015). This location would like to attract more yellow warblers to their 300-acre facilities (King of the Wind Farms).

KIRKHOF CENTER 2201

Statistical Consulting for the Career Center: Evaluating Internships

Presenters: Rachel Borashko, Kimberlee Griggs
Mentors: Rachel Becklin, John Gabrosek

At the end of credit-bearing internships, the Career Center sends out evaluations to the student who completed the internship and the employer. We worked as statistical consultants with Rachel Becklin from the Career Center to look at the evaluations from Fall 2014 through Fall 2015 completed by the employer. The goal of the analysis was to pinpoint trends in the evaluations such as which employers desired future interns.

Beginning at 3:00 PM

KIRKHOF CENTER 1104

Increased Prevalence of the Long-tailed Duck in the Laurentian Great Lakes

Presenter: Keith terHorst
Mentor: Carol Griffin

Over the last few decades, the Laurentian Great Lakes have experienced an increase in the number of both wintering and migrating long-tailed ducks (*Clángula hyemális*). This study focuses on the changes to native marine habitats and breeding locations, in order to determine what initiated this immigration of long-tailed ducks to the Great Lakes. Depletions of historic prey items on the Atlantic coast of the United States compiled with increased food ability in the Great Lakes may have potentially lead to the movement of long-tailed ducks to this freshwater environment. Research has shown that the increase in Great Lakes sea ducks correlated directly with the colonization of the zebra mussel (*Dreissena polymorpha*) in 1998. In addition to serving as a secondary food source, zebra mussels provide habitat for chironomidae and amphiboda invertebrates, the preferred high-energy forage of these waterfowl.

Beginning at 3:30 PM

KIRKHOF CENTER 1104

Conservation of Endangered Species in Kruger National Park, South Africa

Presenter: Elizabeth Esko
Mentor: Carol Griffin

Many animal species in Kruger National Park are at risk of extinction in the near future due to habitat loss and degradation. These include the African elephant, African lion, white and black

rhinoceros, African wild dogs, and many more. Currently the viability of several of these species is threatened due to poaching, because of the demand for fur, elephant ivory, and rhino horns. The goal of this research is to find a viable way to conserve these species. To achieve this goal all endangered species must be studied. All literature on each species, To achieve this goal all endangered species must be studied. All literature on each species, including population size, habitat area, and threats must be collected. Once collected, it must be studied and interpreted to plan a way to protect each vulnerable species. I expect to find that the populations of many species are drastically decreasing and their habitats are disappearing at an increasing rate. Many species could soon become extinct if no action is taken to reduce the poaching, and protect these animals and their habitat.

KIRKHOF CENTER 2201

Experimental Archaeology: Casting Bronze Roman Fibulae

Presenter: Chehallis Robinson
Mentor: Renee Zettle-Sterling

My experimental archaeology project aimed to recreate three bronze Roman fibulae. Fibulae are brooches of varying sizes and styles that Romans used to pin clothing. Studying objects like these can give insight into cultural perspectives on self presentation and adornment as well as individual status. In order to recreate these I used the metalworking technique called casting where I created a replica in wax, which was then used to create a plaster mold, which was filled with bronze. This method is similar to the 'lost wax technique' which is thought by some to have been the means of production for ancient bronze objects. By recreating this process I gained knowledge into how these artifacts were produced, a subject still debated by scholars. This knowledge can give further insight into the process of manufacture for these objects, based on my own success and failures while using these methods. I will present my methods and clothing using the final products will be modeled.

KIRKHOF CENTER 2263

William Henry Pommer's *St. Etheldethelwethelberga*: A Case Study of German-American Music

Presenter: Nikolaus Schroeder
Mentor: Lisa Feurzeig

William Henry Pommer was respected as a pedagogue and proponent of music education reform in late 19th- and early 20th-century Missouri. Early in his career, he was also well-received as a composer in various genres, including operetta. He stands out as a third-generation, Midwestern, and German-American composer in an era of integration and assimilation. His resistance to his

formal German training was distinctive; he rejected some Old World traditions while embracing others, which gave his works a unique (and truly German-American) tone. In his work *St. Etheldethelwethelberga* (ca. 1878), a comic operetta on the relationship of a princess and a Welsh slave, these qualities are established: his "Free-Thinking" upbringing manifests itself in his librettist's mockery of the church, his German-ness in the mockery of the Welsh and Irish, and, most interestingly, his anti-traditional composition style in his unique musical mannerisms and gestures.

KIRKHOF CENTER 2266

The Story of SafetySit

Presenter: Mark Harburg
Mentor: Shabbir Choudhuri

In the fall of 2014 Spectrum Health approached the presenter's engineering class at GVSU with a set of recurring problems in their hospitals. Working closely with Spectrum's therapists, his engineering team developed a functional prototype solving the problem described below. Market research showed that not only could this solution solve a problem for many therapists, but it would save hospitals billions of dollars. With this, we created our company, SafetySit LLC. We now have two prototypes, lots of market and financial validation, a provisional patent, and incredible momentum.

Problem: When physical and occupational therapists work with their patients, they must have the patients be supported in an upright sitting position on hospital beds. This task is difficult to do oneself, so the therapists find other healthcare staff to support the patient, requiring a significant amount of personnel on staff to be available. This problem causes huge financial inefficiencies and losses for hospitals.

KIRKHOF CENTER 2270

AtomAction: A Pedagogical Tool

Presenter: Katelyn Mulder
Mentors: Mary Karpen, Gregory Wolffe

Beginning chemistry students sometimes have difficulty imagining life at the molecular level; the concept of electrostatic molecular interactions and the forces behind them is difficult to learn and even harder to visualize. The central focus of this project is to produce a pedagogical tool designed to aid chemistry students in visualizing the behavior of molecules via intermolecular interactions. Using the Lennard-Jones potential and Coulomb's law we calculate the molecular motion of ions and molecules. We use the OpenGL Shader Language to graphically represent this

dynamic system. Our goal is to create a tool that implements a customizable, scientifically accurate simulation with a user-friendly interface.

Beginning at 4:00 PM

KIRKHOF CENTER 1104

Effects of Microbead Pollution on Aquatic Organisms in Marine Environments

Presenter: Shelbi Small
Mentor: Carol Griffin

Microbead pollution has become a concern for marine ecosystems around the world. Plastic microbeads are used in cosmetics, personal-care, and beauty products such as toothpastes, soaps and facial scrubs, and enter the waterways through drain systems, spills in factories and as a raw byproduct of plastic products. These microbeads have been found in quantities high enough to have detrimental effects on marine ecosystems and may have already become an irreversible problem. The effects of microbead pollution on aquatic life in marine ecosystems will be reviewed from published literature from the past ten years. This research will provide insight to major problems that have occurred such as aquatic life health issues due to toxin transfers from the microbeads and transfer of these toxins throughout the food chain, as well as the physical effects plastic microbeads have on aquatic life.

KIRKHOF CENTER 2201

Paternal Effects on Longevity Revealed by Analysis of Telomere State in *Drosophila melanogaster*

Presenter: Jonathon Richards
Mentor: Georgette Sass

Telomeres protect DNA from degradation, yet each DNA replication shortens telomeres reducing their effectiveness. Telomeres also act as molecular timers with length a factor in enhanced longevity. In humans, older fathers produce longer-lived progeny, an observation possibly related to longer telomeres in their sperm. I have examined the effects of paternal age on offspring longevity in *Drosophila melanogaster* and whether telomere status influences survival. We predict older fathers will produce longer-lived progeny compared to younger fathers. In our study, *Drosophila* males were aged 1, 10, or 20 days, crossed with virgins and then offspring were assayed. We see a positive relationship between age of *Drosophila* males and longevity of offspring. We also investigated telomere state and its impact on longevity. The UAS/GAL4 ectopic expression system is used to alter telomere chromatin in spermatocytes with chromatin structure changes detected via

reporter gene expression in offspring.

KIRKHOF CENTER 2215

The Effects of Adventure Therapy on Individuals with Autism Spectrum Disorder

Presenters: Sam Brennan, Jennifer Feldpausch, Juane Odendaal, Alexandra Perrien
Mentor: Dawn De Vries

The purpose of this study is to evaluate the outcomes that individuals with Autism Spectrum Disorder (ASD) can gain by participating in adventure therapy programs. The outcomes of this intervention, implemented by a Certified Therapeutic Recreation Specialist (CTRS) will in turn identify the best practices for the application of adventure therapy. Research has produced adequate support that adventure therapy has positive effects for individuals diagnosed with ASD. Some of these outcomes include: increased social and behavioral development, increased level of self-awareness, and improved team building/problem-solving skills. Our study concluded that individuals with ASD do benefit from participation in adventure therapy.

KIRKHOF CENTER 2263

Gridline Graphs in Three and Higher Dimensions

Presenters: Andrew Dickinson, Stephanie Loewen, Morgan Oneka
Mentor: Feryal Alayont

A graph is a mathematical model of objects and relationships between them, where dots represent objects and the lines between dots represent relationships. A gridline graph is a type of graph where we can choose our dots to be on the *xy*-plane and there are connections between two dots if they share an *x* or *y* coordinate. This definition can be generalized to any dimensions by letting dots be in the n-dimensional space. In this talk, we will consider the properties of the generalization of gridline graphs to three and higher dimensions. We will also discuss the properties of the gridline dimension concept defined by using this generalization.

KIRKHOF CENTER 2266

The Polar Bear Expedition: A Bottom-Up Reinterpretation of America's Military Intervention in Northern Russia

Presenter: Jordan Cloud
Mentor: James Smither

During the Russian Civil War, the American military sent troops to Northern Russia to guard supplies sent to the country's former government. Known as the Polar Bear Expedition, this force

was a part of a larger Allied expeditionary force under British leadership. Landing in Russia in September 1918, the American troops were used by the British command as combat troops for the purpose of directly intervening in Russia's civil war. Lasting only nine months, the expedition failed in its original goals as well as those set for it by the British. To date, the only military histories written on the expedition have been top-down in their approach. Frequently these histories fail to critically analyze a large portion of the primary source material and often adopt the biases found in the sources. Consequently, a bottom-up history is needed in order to properly understand the history of the expedition, as well as to correct errors in the historical record caused by a lack of critical analysis.

KIRKHOF CENTER 2270

Skegemog Point Archaeology

Presenter: Emily Bartz
Mentor: Janet Brashler

The Skegemog Point Site in Grand Traverse County Michigan is a multi-component Late Woodland Site which was occupied from Paleo to Historic time periods. The site was excavated in 1965-66 by MSU and WMU under the direction of Dr. Charles Cleland. Although the ceramic and stone tool assemblages at this site have been analyzed, little is known about the cache pit complexes located just south of the occupation area. Cache pits are storage pits dug by Native Americans during the late pre-contact period to store food. The Skegemog Point site has over one hundred of these pits which have not been previously mapped. This presentation describes the location of the cache pits in relation to post-glacial beach sequences. An ArcGIS map provides a tool to understand storage and other activities at this site without disturbing these features. This research is significant given continuing discussions about the emergence of caching as a food storage strategy for Upper Great Lakes lifeways.

Beginning at 4:30 PM

KIRKHOF CENTER 1104

Manipulating Soil Composition and Its Effects on Vegetable Growth

Presenter: Titania Stewart
Mentor: Carol Griffin

Various factors affect the success of urban gardening including sun, soil and water. Urban gardens have several soil types, which can be modified, similar to the manner in which farmers increase harvest. This experiment aims to determine the most efficient and cost-effective way to modify soil in order to increase vegetable yield. The soil sample is clay from a wetland in Kentwood, MI. Clay

soil types have smallest size grouping of particles and relatively high bulk density, which inhibits root growth, limiting the growth of vegetables. For this project, Detroit Red beets and Grand Rapids lettuce will be grown in a greenhouse, which will be planted in various compost mixtures (garden soil ratios: 4:4, 3:4, 2:4, 1:4), along with a pure garden soil control sample. Vegetables will be harvested and dried before weighing. The soil density, organic matter (OM), and soil pH will be collected. The results will be analyzed to determine whether harvested weight is affected by soil factors.

KIRKHOF CENTER 2263

Strength in Numbers: Online Powerlifting Training with Lucy

Presenter: Michael Hurley
Mentor: Daniel Slaughter

The saying “failing to plan is planning to fail” can be applied to most aspects of life, but it is essential to training for powerlifting. Powerlifting consists of attempting to lift the most weight for one repetition in the squat, bench press, and deadlift in a meet. Your best successful attempts at each lift are added together to get your total, which along with body weight, is used to judge lifters. In order to increase your maximum strength, you must train properly following a predetermined plan. Lucy is an application developed with Ruby on Rails and MySQL designed to assist lifters in creating proper training plans. Using information about the lifter’s weaknesses, gym equipment, and training history, Lucy will design a training program that can be used to increase powerlifting performance. Lucy is named after my late grandmother, Lucille Staisiunas, whom regrettably was never able to attend any of my powerlifting meets before she passed.

KIRKHOF CENTER 2266

Earthworm Activity in the Presence of Invasive Plant Species

Presenters: Ryan Boggs, Steven Karbownik
Mentors: John Gabrosek, Mel Northup

This project involved analyzing data collected by Professor Mel Northup. Through our analysis, we sought to find any relationships between earthworm activity and invasive plant species. Over the past three years, Professor Northup has been conducting observations at the Blandford Nature Center. These observations have involved the professor (and a select group of students) taking measurements of seven different variables at the Blandford Nature Center. After the data were collected, we ran statistical analyses to see if earthworm activity is not greater in the presence of invasive plant species, or if earthworm activity is greater in the presence of invasive plant species.

Panel Presentations, Abstracts & Schedule

Beginning at 2:00 PM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Divergent Perspectives in the French Enlightenment

Presenters: Cayla Dwyer, Meghan Forest, Elizabeth Konen, Anne Livingston
Mentor: David Eick

The French Enlightenment marked a time in which citizenship was in the process of being redefined. This intellectual stir led to the creation of several key Enlightenment values to which all men were to be rightfully entitled. These newfound "freedoms" included the pursuit and right to happiness here on earth and education unlimited by the beliefs of the Catholic Church, a body of powerful individuals who saw the Enlightenment as a harbinger of the apocalypse. Running parallel to the Enlightenment was the Counter-Enlightenment, a reactionary movement that developed as a way to vindicate the principal beliefs of the Church that were criticized by the *philosophes*. "Diverse Perspectives in the French Enlightenment" examines this conflict through four unique perspectives: recruitment to Diderot's *Encyclopédie*, the relationship of the Counter Enlightenment to the Counter-Reformation, feminist inclusion in the Enlightenment, and correspondence between the Church and *philosophes*.

Beginning at 4:00 PM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Westown Scenarios

Presenters: Selina Dorking, Megan Galvin, Morgan Hayden, Stephen Hoogewerf, Ian Thompson
Mentor: Paul Wittenbraker

Westown Scenarios is a collaborative project created and presented by GVSU students. Westown Scenarios was developed during Civic Studio, a visual studies course offered at GVSU. We developed a 2-D art exhibit which displays our proccess of scenario logics, around the focal issue "Who Thrives in Westown?"

Exhibition of Art

9:00 AM - 6:00 PM
Artist Reception 5:00 PM

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 01

Infestation: Video Piece

Participants attending 5:00 PM - 6:00 PM
Presenter: Molly Lucille
Mentor: Anna Campbell

To be a woman is to exist in a state of constant critique. When a woman is self sufficent and strong, she is labled as “bossy” and her opinion is ridiculed and disregarded. When a woman is sensitive and quiet, she is labled as weak, and her opinion is disregarded. To exist with this sense of futility is to exist in a world of frustration. Inspired by the fairy tale “Diamonds and Toads”, this piece expresses the tension between the expectations in place for a woman, and expresses the impossibility of these ideals. One can never fully fufill any expectation or qualification to be considered an ideal, though one might try.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 02

Geography and Situation

Participants attending 5:00 PM - 6:00 PM
Presenter: Jordan Szala
Mentor: Dellas Henke

Jordan Szala is a junior, studying for her BFA in printmaking. Though printmaking is her declared emphasis area, she is very active and interested in other disciplines like sculpture and painting. Szala’s printmaking work explores ideas of home that frequently change based on where one finds oneself situated at the time. Themes of memory and nostalgia accompany her pieces as well.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 03

Printmaking Process

Participants attending 5:00 PM - 6:00 PM
Presenter: Katherine Dana
Mentor: Dellas Henke

The process of printmaking has limitless possibilities for experimentation and play. This work

explores the different ways in which printmaking lends itself to the process of discovery. The medium allows experimentation, and this has taught me a great deal about new ways of thinking. For me, the process of art is far more interesting than the finished artwork because it enables learning and problem solving. The images I chose for this series were photographs I took at Pictured Rocks in the Upper Peninsula. The name “Pictured Rocks” comes from the streaks of mineral stain that decorate the face of the cliffs. Throughout the history of viewing the rocks, many people have seen pictures, figures, shapes, and created stories behind the patterns embedded in the cliffs. The photographs I took were drawn to represent only the patterns, shape and rhythm in nature. I was searching for new patterns that emerged in every print, and seeking to explore any possibility for experimentation.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 04

Paper Architecture

Participants attending 5:00 PM - 6:00 PM
Presenter: Keziah Philipps
Mentor: Dellas Henke

This map is an exploration of a Utopian city where form is prioritised over function. This map is a companion to another imagined city based on efficiency or reason. I frequently use cartographical devices to explore and map ideas, from “mind-maps” to charting an actual or imagined experience, using perspectives as needed from relief (a logical but impossible straight down view), to charting ideas in a mind-map which has no geographical context at all, or in the case of this etching, a birds-eye view or views. It is as if the bird is flying about and occasionally landing so that perspectives change at will and intuitively. This allows the viewer to both experience and understand the design of the city.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 05

2016 Calendar Design

Participants attending 5:00 PM - 6:00 PM
Presenter: SeoHee Lee
Mentor: Vinicius Rebello Lima

The assignment was to create a new year calendar in a different way by using typography. I tried to make a subtle but dynamic impression of movement by using bold numbers in the middle of the page and putting dates vertically. Dates and names of each month create the flow at the top and bottom of the flat surface. Watercolor splashes add dimension and energy to the design. Red dates indicate Sundays and holidays for the year.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 06

The Limits of Visuality

Participants attending 5:00 PM - 6:00 PM
Presenter: Annie Teall
Mentors: Collin Bradford, Paul Wittenbraker

My piece for this exhibition, *The Limits of Visuality*, is the documentation of a performance piece which involved the realization of the rectangular frame of the video recording in physical space. This project was conceptually perfectly self-contained, not only in that the parameters of the performance were determined by the framing device of the camera, but also in that the performance was an attempt to delineate the parameters of the camera's ability to record visual information within a space. The method of displaying the video, via projector, further elaborates on this relationship between the performance and the video, as the projection acts as an inversion of the relationship between the camera and the image. In addition, I will be presenting two mixed media works dealing with related thematic content.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 07

Relationships in Design

Participants attending 5:00 PM - 6:00 PM
Presenter: Nathan Spangenberg
Mentor: Vinicius Rebello Lima

When two objects (image and type) are placed into a defined space, a relationship is developed. As designers we are faced with developing these relationships using compositional principals (balance, rhythm, unity, contrast, color, alignment, etc). In understanding how these principals can be utilized we are able to create unifying visual relationships between typographic and non-typographic material. In the studies I am presenting I have used many of the principles listed above to create arresting relationships between the images themselves and type within each space.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 08

Small Town, Michigan

Participants attending 5:00 PM - 6:00 PM
Presenter: Natasha VanGessel
Mentors: Anthony Thompson, Victoria Veenstra

Being from a pretty expansive city, small towns have always held a little fascination and trepidation for me. It wasn't until my empty-nested parent moved to a small town that I was able to see just exactly what makes up these microcommunities. The body of work you see here came to

characterize the small towns all over Michigan with elements that those from a small town might mistake for a part of their own. Welcome to Small Town, Michigan.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 09

Modify

Participants attending 5:00 PM - 6:00 PM
Presenter: Kathryn McAllister
Mentors: Collin Bradford, Paul Wittenbraker

Modify is a time based work that explores the ways in which we change and influence others physically and mentally. This exchange is demonstrated through bodies interacting with one another by altering one person's physical path and body with various intentions. This work examines human connections through physical touch and the ways we recieve multiple forms of influences on our identity.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 10

Untitled, 2015

Participants attending 5:00 PM - 6:00 PM
Presenter: Mallory Wolfgram
Mentors: Anthony Thompson, Victoria Veenstra

I have always been interested in intimate, snapshot style photography. I'm inspired by the works and contributions of Nan Goldin, Hiromix, and Ryan McGinley to this style of photography. Studying the photographs in this genre of photography has led me to create my most personal body of work yet. This series is my visual diary as I cope with anxiety, depression, and medication. It aims to show my transition from overwhelming, racing thoughts to being more leveled, and sometimes feeling nothing at all.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 11

Westow(o)n Scenarios

Participants attending 5:00 PM - 6:00 PM
Presenters: Selina Dorking, Megan Galvin, Morgan Hayden, Stephen Hoogewerf, Ian Thompson
Mentor: Paul Wittenbraker

Westown Scenarios is a collaborative project created and presented by GVSU students. Westown Scenarios was developed during Civic Studio, a visual studies course offered at GVSU. We developed a 2-D art exhibit which displays our proccess of scenario logics, around the focal issue

“Who Thrives in Westown?” The Scenario team, consisting of a core group of the focal issue “Who Thrives in Westown?” The Scenario team, consisting of a core group of students, discuss how they were developed, and then conduct a short workshop focussed on how the scenarios highlight issues specific to GVSU.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 12

GVSU Ceramics Forum

Participants attending 5:00 PM - 6:00 PM
Presenters: Virginia Pisto, Chelsey Sall
Mentor: Hoon Lee

Ceramics Forum is an event hosted by GVSU intended to foster exchange between students studying ceramics at different institutions and education levels, and create a public platform for contemporary ceramic discussion. This event is an opportunity for graduates and undergraduates to be involved in organizing a community event to address topics in the ceramic arts. In the past, the forum has included panel discussions, artist lectures, critiques, gallery talks, and a group exhibition. The goal is to stage a mutually beneficial event for both graduate and undergraduate students. For the graduate students, the forum provides a visiting artist atmosphere, a chance for professional development, as well as building connections with fellow graduates. For the undergraduates, this is a chance to have critical interactions with advanced makers, discuss post-undergraduate options, and exhibit their work. The works featured were made in response to the 7th Annual GVSU Ceramics Forum.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 13

Domesticity and the Body

Participants attending 5:00 PM - 6:00 PM
Presenter: Jordan Szala
Mentor: Anna Campbell

Jordan Szala is a junior, studying for her BFA in printmaking. Though printmaking is her declared emphasis area, she is very active and interested in other disciplines like sculpture and painting. Szala’s sculpture work is textile based and exists between painting and sculpture, creating ambiguous figurative forms. Focused on queer topics and issues, her pieces breathe life into the uncertain, in-between, and unknown aspects of understanding identity.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 14

Birth

Participants attending 5:00 PM - 6:00 PM
Presenter: Molly Lucille
Mentor: Anna Campbell

The inaccessibility of birth control for women across the globe is rooted within the mindset that female sexuality is something to be ignored, disregarded or immoral. The symbol of the birth control packs recalls these uncertainties that shroud acceptance and celebration of women's sexuality.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 15

The Electric Lady Series

Participants attending 5:00 PM - 6:00 PM
Presenter: Jillian Thompson
Mentor: Beverly Seley

Influenced from hip hop culture at a young age, I have created a body of work that reflects the strength, style and grace of African American women within the culture. In the culture adornment is used to symbolize wealth, confidence and cultural identity which is often flashy, chunky and loud. With that I have created my own expression of the current culture.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 18 - DC

Ecosystems

Participants attending 5:00 PM - 6:00 PM
Presenter: Audrey King
Mentor: Beverly Seley

This series focuses on specific ecosystems found in unexpected areas, usually pertaining to the body.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 19

Tangible Unconscious

Participants attending 5:00 PM - 6:00 PM
Presenter: Rachel Britton
Mentor: Stafford Smith

Tangible Unconscious is a body of work visualizing the doubts that lie within: Mistakes made,

low self-esteem, regrets of the past, and the fear of failure possess our capabilities to pursue our passions. The work focuses on the tension of doing what we love versus doing what we *think* will make us happy, and how giving in to that illusion will force us to surrender to our inner demons. By manipulating multiple images into one, the artist confronts her fears, and by doing so, she challenges her inner-uncertainty and uses it to produce work she was once too afraid to face.

Live Performance

Beginning at 12:00 PM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM
The V-Card Series and Other Poems
Presenter: Kelsey May
Mentors: Brian Deyo, James Persoon

The V-Card Series involved developing a series of poems sharing differing perspectives, emotions, stories, and hope for victims of sexual assault, as well as violators. Why is this series needed? One in every five women will be a victim of sexual assault or rape in her lifetime. This problem is not going away unless we act. I have conducted interviews and completed research unearthing a range of stories, and all the source material for the series is true, so as to emphasize that each poem is the story of an individual. My set of poetry will open the issue to those who are struggling and want to ask for help or work through their histories.

Film / Video

Beginning at 9:00 AM

MARY IDEMA PEW LIBRARY MAIN FLOOR VIDEO DISPLAY
Tiny Flowing Currents
Presenter: Molly Labeff
Mentors: Collin Bradford, Paul Wittenbraker

While making this piece, I was interested in creating a wordless visual poem. As a photographer, I seek things that are well-seen, that I can compose, light and make photogenic, and capture them with a camera to hold on to. Going through motions of my day and studying time-based art, I realized that movements can be photogenic too. I wanted to capture expansions of moments, not just single frames frozen in a fraction of a second. Working as if to create a visual love poem, some poetry I've been reading that may have inspired scenes or themes of this piece are works by Frost, Plath and Bukowski.

Index of Presenters and Mentors
(Sorted by Last Name)

A

Aboufadel, Edward	Mentor	9:00 a.m.	Henry Hall Atrium 023
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Adams, Jacob	Student	9:00 a.m.	Kirkhof Center GRR 141
Aernouts, Alyvia	Student	9:30 a.m.	Kirkhof Center 2215
Alayont, Feryal	Mentor	9:00 a.m.	Kirkhof Center GRR 141
Alayont, Ferya	Mentor	4:00 p.m.	Kirkhof Center 2263
Albert, Robert	Student	4:00 p.m.	Henry Hall Atrium 070
Albert, Robert	Student	11:00 a.m.	Henry Hall Atrium 071
Albert, Robert	Student	10:00 a.m.	Kirkhof Center GRR 019
Albertson, Luke	Student	11:00 a.m.	Kirkhof Center GRR 128
Alder, Andrew	Student	10:00 a.m.	Henry Hall Atrium 088
Aldrich, Naomi J.	Mentor	9:00 a.m.	Kirkhof Center GRR 139
Allen, Monique	Student	9:00 a.m.	Kirkhof Center GRR 117
Alvarado, Juliana	Student	9:00 a.m.	Kirkhof Center GRR 106
Alvarez, Kaitlin	Student	9:00 a.m.	Kirkhof Center GRR 004
Ambrose, Bradley	Mentor	9:00 a.m.	Henry Hall Atrium 019
Ames, Ethan	Student	9:00 a.m.	Kirkhof Center GRR 103
Anderson, Kyle	Student	12:00 p.m.	Henry Hall Atrium 046
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Andringa, Ryan	Student	9:00 a.m.	Kirkhof Center GRR 071
Armistead, Brooke	Student	10:00 a.m.	Henry Hall Atrium 035
Arnett, Michelle	Student	9:00 a.m.	Kirkhof Center GRR 104
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Ash, Chantelle	Student	11:00 a.m.	Kirkhof Center GRR 146
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Babb, Chandler	Student	11:00 a.m.	Henry Hall Atrium 071
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Ballew, Brianna	Student	1:00 p.m.	Henry Hall Atrium 074
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Balzeski, Thomas	Student	9:00 a.m.	Henry Hall Atrium 067
Bana, Shukri	Student	11:30 a.m.	Kirkhof Center 2266
Banister, Anna	Student	10:00 a.m.	Kirkhof Center GRR 053
Barber, Amber	Student	3:00 p.m.	Kirkhof Center GRR 062
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Bartkus, Amy	Student	12:00 p.m.	Henry Hall Atrium 036
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Bartz-Smith, Shari	Mentor	9:00 a.m.	Kirkhof Center GRR 079
Bassler, Zachary	Student	9:00 a.m.	Kirkhof Center GRR 007
Baxter, M. Aaron	Mentor	9:00 a.m.	Kirkhof Center GRR 142
Baxter, M. Aaron	Mentor	9:00 a.m.	Kirkhof Center GRR 081
Baxter, M. Aaron	Mentor	9:00 a.m.	Kirkhof Center GRR 091
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Benke, Charles	Student	3:00 p.m.	Kirkhof Center GRR 020
Benvenuti, Katelyn	Student	12:00 p.m.	Kirkhof Center GRR 110
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Berglund, Anna	Student	1:00 p.m.	Kirkhof Center GRR 107
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Bergman, Daniel	Mentor	9:00 a.m.	Kirkhof Center GRR 040
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Bertschinger, Kevin	Student	9:00 a.m.	Henry Hall Atrium 084
Bertschinger, Kevin	Student	2:00 p.m.	Kirkhof Center GRR 114
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Biros, Shannon	Mentor	9:00 a.m.	Kirkhof Center GRR 136
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Borashko, Rachel	Student	2:30 p.m.	Kirkhof Center 2201
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Bracken, Audrey	Student	10:00 a.m.	Kirkhof Center GRR 145
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Bradford, Collin	Mentor	9:00 a.m.	MIP Library Exhibition Space 06
Bradford, Collin	Mentor	9:00 a.m.	Library Main Floor Video Display
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Brown, Erin	Student	10:00 a.m.	Kirkhof Center GRR 019
Brown, Sarah	Student	12:30 p.m.	Kirkhof Center 2263
Brunges, Hunter	Student	11:00 a.m.	Kirkhof Center GRR 108
Bruseloff, Shelby	Student	11:00 a.m.	Kirkhof Center 2266
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Busch, Bethany	Student	9:00 a.m.	Kirkhof Center GRR 073
Bush, Emily	Student	9:00 a.m.	Kirkhof Center GRR 005
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Cabelof, Alyssa	Student	12:00 p.m.	Henry Hall Atrium 093
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Chatfield, Abigail	Student	1:00 p.m.	Henry Hall Atrium 061
Cheatham, Dionna	Student	9:00 a.m.	Kirkhof Center GRR 078
Cheatham, Dionna	Student	9:00 a.m.	Kirkhof Center GRR 068
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Choudhuri, Shabbir	Mentor	3:30 p.m.	Kirkhof Center 2266
Chrispell, Jordan	Student	1:00 p.m.	Kirkhof Center GRR 064
Christians, Matthew	Mentor	9:00 a.m.	Henry Hall Atrium 034
Christoffersen, Evan	Student	9:00 a.m.	Kirkhof Center GRR 136
Chung, Janet	Student	11:00 a.m.	Henry Hall Atrium 009
Ciliak, Nick	Student	9:00 a.m.	Kirkhof Center GRR 092
Clark, David	Mentor	9:00 a.m.	Henry Hall Atrium 065
Clark, Lauren	Student	11:00 a.m.	Henry Hall Atrium 036
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Cobb, Chandler	Student	9:00 a.m.	Kirkhof Center GRR 104
Coleman, Casey	Student	9:00 a.m.	Kirkhof Center GRR 105
Colgan, Patrick	Mentor	9:00 a.m.	Henry Hall Atrium 054
Collier, Andrew	Student	9:00 a.m.	Kirkhof Center 2270
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Comment, Taylor	Student	4:00 p.m.	Kirkhof Center GRR 013
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Cook, Paul	Mentor	9:00 a.m.	Kirkhof Center GRR 024
Cook, Paul	Mentor	9:00 a.m.	Kirkhof Center GRR 027
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Cook, Paul	Mentor	12:30 p.m.	Kirkhof Center 2266
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Coolidge, Grace	Mentor	9:00 a.m.	Kirkhof Center GRR 087
Copenhaver, Lee	Mentor	12:00 p.m.	Kirkhof Center 2201
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Cousino, Abigail	Student	11:00 a.m.	Henry Hall Atrium 001
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Crofoot, Morgan	Student	9:00 a.m.	Henry Hall Atrium 067
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Davis, Danielle	Student	9:00 a.m.	Kirkhof Center GRR 047
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De Sousa, Justin	Mentor	9:00 a.m.	Kirkhof Center GRR 118
De Sousa, Justin	Mentor	9:00 a.m.	Kirkhof Center GRR 038
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De Vries, Dawn	Mentor	11:30 a.m.	Kirkhof Center 2215
De Vries, Dawn	Mentor	12:00 p.m.	Kirkhof Center 2215
De Vries, Dawn	Mentor	12:30 p.m.	Kirkhof Center 2215
De Vries, Dawn	Mentor	1:00 p.m.	Kirkhof Center 2215

De Vries, Dawn	Mentor	4:00 p.m.	Kirkhof Center 2215
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DeMuth, Danielle	Mentor	11:00 a.m.	Kirkhof Center 2263
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DeVries, Jennie	Student	9:30 a.m.	Kirkhof Center 2263
Dean, Kristy	Mentor	9:00 a.m.	Kirkhof Center GRR 070
Dean, Kristy	Mentor	9:00 a.m.	Kirkhof Center GRR 055
Dean, Kristy	Mentor	9:00 a.m.	Henry Hall Atrium 016
Deaner, Robert	Mentor	9:00 a.m.	Kirkhof Center GRR 026
Decker, Kyle	Student	10:00 a.m.	Henry Hall Atrium 072
Denard, Sean	Mentor	9:00 a.m.	Henry Hall Atrium 053
Deremer, Katherine	Student	9:00 a.m.	Kirkhof Center GRR 138
Deyo, Brian	Mentor	12:00 p.m.	MIP Library Multipurpose Room
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Dickson, Taylar	Student	12:00 p.m.	Kirkhof Center GRR 145
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Douglas, Clint	Student	9:00 a.m.	Kirkhof Center GRR 023
Doyle, Daniel	Student	12:00 p.m.	Henry Hall Atrium 039
Duckworth, Jeremiah	Student	9:00 a.m.	Kirkhof Center GRR 023
Dukes, Helen	Student	10:00 a.m.	Kirkhof Center GRR 117
Dula, Tyler	Student	2:00 p.m.	Kirkhof Center 1104
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Durkee, Ryan	Student	9:30 a.m.	Kirkhof Center 2270
Dwyer, Cayla	Student	2:00 p.m.	MIP Library Multipurpose Room

E

Eason, Alexander	Student	12:00 p.m.	Henry Hall Atrium 075
Edwards, Ashley	Student	9:00 a.m.	Henry Hall Atrium 092
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Eick, David	Mentor	1:00 p.m.	Kirkhof Center 2263
Eick, David	Mentor	2:00 p.m.	MIP Library Multipurpose Room
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Ekye-Addai, Akua	Student	1:00 p.m.	Henry Hall Atrium 055
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Elsen, Joe	Student	12:00 p.m.	Henry Hall Atrium 044
Emelander, Kaitlyn	Student	9:00 a.m.	Kirkhof Center 2266
Engelsma, Joshua	Student	9:00 a.m.	Kirkhof Center GRR 143
Entz, Isaac	Student	4:00 p.m.	Henry Hall Atrium 054
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Eslamian, Shahrzad	Student	1:30 p.m.	Kirkhof Center 2266
Everse, Nicholas	Student	10:00 a.m.	Kirkhof Center 1142

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Feldpausch, Jennifer	Student	4:00 p.m.	Kirkhof Center 2215
Feldpausch, Nicholas	Student	3:00 p.m.	Henry Hall Atrium 104
Feldt, Melissa	Student	12:00 p.m.	Kirkhof Center GRR 110
Feurzeig, Lisa	Mentor	3:30 p.m.	Kirkhof Center 2263
Fields, Jennifer	Student	9:00 a.m.	Kirkhof Center GRR 111
Fischer, Rachel	Student	9:00 a.m.	Kirkhof Center GRR 029
Fish, Kyle	Student	10:00 a.m.	Henry Hall Atrium 009
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Flinsky, Sarah	Student	11:00 a.m.	Henry Hall Atrium 043
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Fornicola, Errin	Student	11:00 a.m.	Kirkhof Center GRR 026
Francis, Joel	Student	11:30 a.m.	Kirkhof Center 2270

Francis, Joel	Student	12:30 p.m.	Kirkhof Center 2266
Frank, Barrett	Student	1:00 p.m.	Henry Hall Atrium 083
Freestone, Kray	Student	9:00 a.m.	Kirkhof Center GRR 043
French, Hannah	Student	10:00 a.m.	Henry Hall Atrium 030
Friedlmeier, Wolfgang	Mentor	9:00 a.m.	Kirkhof Center GRR 096
Frimodig, Kendall	Student	11:00 a.m.	Kirkhof Center GRR 077
Frobish, Marcia	Mentor	9:00 a.m.	Henry Hall Atrium 015
Frymier, Conner	Student	10:00 a.m.	Kirkhof Center GRR 044
Fucinari, David	Student	9:00 a.m.	Henry Hall Atrium 006

G

Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 082
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 053
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 048
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 062
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 015
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 052
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 072
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 086
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 056
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 061
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 058
Gabrosek, John	Mentor	9:30 a.m.	Kirkhof Center 2201
Gabrosek, John	Mentor	10:30 a.m.	Kirkhof Center 2263
Gabrosek, John	Mentor	2:30 p.m.	Kirkhof Center 2201
Gabrosek, John	Mentor	4:30 p.m.	Kirkhof Center 2266
Galbraith, Christopher	Student	1:00 p.m.	Henry Hall Atrium 046
Galen, Luke	Mentor	9:00 a.m.	Kirkhof Center GRR 008
Galloup, Peter	Student	10:00 a.m.	Henry Hall Atrium 105
Galvin, Brittany	Student	10:00 a.m.	Henry Hall Atrium 015
Galvin, Megan	Student	9:00 a.m.	MIP Library Exhibition Space 11
Galvin, Megan	Student	4:00 p.m.	MIP Library Multipurpose Room
Ganshirt, Allison	Student	9:00 a.m.	Kirkhof Center GRR 122
Garcia, Maria	Student	9:00 a.m.	Kirkhof Center 2215
Gardner, Jeffrey	Student	9:00 a.m.	Kirkhof Center GRR 115
Garnsey, Cody	Student	10:00 a.m.	Henry Hall Atrium 089
Garringer, Lisa	Mentor	10:30 a.m.	Kirkhof Center 2263
Garstick, Alese	Student	11:00 a.m.	Kirkhof Center 2215
Garvin, Travis	Student	9:00 a.m.	Kirkhof Center GRR 048

Gauthier, Cody	Student	11:00 a.m.	Kirkhof Center GRR 080
Geierman, Benjamin	Student	9:00 a.m.	Kirkhof Center GRR 103
Gentner, Tiffany	Student	9:00 a.m.	Kirkhof Center GRR 124
George, Brandon	Student	10:00 a.m.	Henry Hall Atrium 056
George, Logan	Student	10:00 a.m.	Henry Hall Atrium 087
Geselman, Maria	Student	2:00 p.m.	Henry Hall Atrium 021
Ghiasvand, Noor	Mentor	9:00 a.m.	Kirkhof Center GRR 119
Ghiasvand, Noor	Mentor	9:00 a.m.	Henry Hall Atrium 001
Ghysels, Serena	Student	1:00 p.m.	Kirkhof Center 2263
Gibson, Stephanie	Student	9:00 a.m.	Kirkhof Center GRR 029
Gilchrist, Corbin	Student	9:00 a.m.	Henry Hall Atrium 006
Gilliam, Nora	Student	9:00 a.m.	Henry Hall Atrium 002
Gipson, Karen	Mentor	9:00 a.m.	Kirkhof Center GRR 100
Girouard, Alexa	Student	1:00 p.m.	Kirkhof Center GRR 064
Glass, Stephen	Mentor	9:00 a.m.	Henry Hall Atrium 071
Glass, Stephen	Mentor	9:00 a.m.	Kirkhof Center GRR 019
Gomez, Kyle	Student	10:00 a.m.	Henry Hall Atrium 072
Gonzales, Joshua	Student	10:00 a.m.	Henry Hall Atrium 028
Goodwin, Raven	Student	10:00 a.m.	Kirkhof Center GRR 145
Graeser, Stephen	Student	9:00 a.m.	Henry Hall Atrium 003
Graham, Douglas	Mentor	9:00 a.m.	Kirkhof Center GRR 091
Gravelyn, John	Student	10:00 a.m.	Henry Hall Atrium 069
Gray, Hannah	Student	2:00 p.m.	Kirkhof Center GRR 030
Gray, Kismet	Student	9:00 a.m.	Henry Hall Atrium 099
Green, Alex	Student	9:00 a.m.	Henry Hall Atrium 099
Green, Jillian	Student	9:00 a.m.	Kirkhof Center GRR 091
Greer, Gary	Mentor	9:00 a.m.	Henry Hall Atrium 073
Gregory, Kyle	Student	10:00 a.m.	Henry Hall Atrium 088
Grider, Kristen	Student	9:00 a.m.	Kirkhof Center GRR 132
Griffin, Carol	Mentor	9:00 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	9:30 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	10:00 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	10:30 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	11:00 a.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	1:30 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	2:00 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	2:30 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	3:00 p.m.	Kirkhof Center 1104

Griffin, Carol	Mentor	3:30 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	4:00 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	4:30 p.m.	Kirkhof Center 1104
Griffith, Marie	Student	9:30 a.m.	Kirkhof Center 2201
Griffith, Marie	Student	10:30 a.m.	Kirkhof Center 2201
Griggs, Kimberlee	Student	2:30 p.m.	Kirkhof Center 2201
Groendyke, Bailey	Student	10:00 a.m.	Kirkhof Center GRR 100
Gross, Carley	Student	9:00 a.m.	Kirkhof Center GRR 104
Gross, Jennifer	Mentor	9:00 a.m.	Henry Hall Atrium 028
Grousd, Jennifer	Student	9:00 a.m.	Kirkhof Center 2263
Gruppen, Breanna	Student	9:00 a.m.	Kirkhof Center GRR 106
Guibord, Drew	Student	1:00 p.m.	Kirkhof Center GRR 084
Guiles, Joshua	Student	3:00 p.m.	Kirkhof Center GRR 031
Gulgin, Heather	Mentor	9:00 a.m.	Henry Hall Atrium 020
Gulotty, Eva	Student	2:00 p.m.	Henry Hall Atrium 095
Guthrie, Amaya	Student	11:00 a.m.	Kirkhof Center GRR 008
Gwasdacus, Jeffrey	Student	9:00 a.m.	Kirkhof Center GRR 041
Gyorkos, Amy	Mentor	9:00 a.m.	Henry Hall Atrium 075
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 106
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 111
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 104
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 073
Gyorkos, Amy	Mentor	9:00 a.m.	Henry Hall Atrium 064
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 103
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 110
Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 105

H

Hahs, Emma	Student	10:00 a.m.	Henry Hall Atrium 035
Haines, Brooke	Student	10:00 a.m.	Henry Hall Atrium 004
Hall, Kerstyn	Student	12:00 p.m.	Henry Hall Atrium 020
Ham, Charles	Mentor	2:00 p.m.	Kirkhof Center 2270
Hamel, Emily	Student	9:00 a.m.	Kirkhof Center GRR 080
Hamlin, Hannah	Student	11:00 a.m.	Kirkhof Center GRR 018
Hampton, Mariah	Student	9:00 a.m.	Henry Hall Atrium 076
Hancock, Brieanne	Student	3:00 p.m.	Kirkhof Center GRR 070
Hanson, Rylee	Student	9:00 a.m.	Kirkhof Center GRR 106
Harburg, Mark	Student	3:30 p.m.	Kirkhof Center 2266
Harmon, Michael	Student	11:00 a.m.	Henry Hall Atrium 008

Harrington, Susan	Mentor	11:30 a.m.	Kirkhof Center 2201
Hart, Dawn	Mentor	9:00 a.m.	Kirkhof Center GRR 099
Hart, Dawn	Mentor	9:00 a.m.	Kirkhof Center GRR 007
Hart, Matthew	Mentor	9:00 a.m.	Kirkhof Center GRR 130
Hart, Matthew	Mentor	9:00 a.m.	Kirkhof Center GRR 134
Haskins, Sonny	Student	10:00 a.m.	Kirkhof Center GRR 067
Hatch, Matthew	Student	1:00 p.m.	Kirkhof Center 1142
Hatzel, Brian	Mentor	9:00 a.m.	Henry Hall Atrium 091
Hatzel, Brian	Mentor	9:00 a.m.	Kirkhof Center GRR 030
Hatzel, Brian	Mentor	9:00 a.m.	Kirkhof Center GRR 033
Hayden, Morgan	Student	9:00 a.m.	MIP Library Exhibition Space 11
Hayden, Morgan	Student	4:00 p.m.	MIP Library Multipurpose Room
Hayden, Nolan	Student	9:00 a.m.	Kirkhof Center GRR 071
Hecht, Steven	Mentor	9:00 a.m.	Henry Hall Atrium 110
Hecht, Steven	Mentor	9:00 a.m.	Kirkhof Center GRR 117
Hecht, Steven	Mentor	9:00 a.m.	Kirkhof Center GRR 077
Hefferan, Tara	Mentor	9:00 a.m.	Henry Hall Atrium 041
Hefferan, Tara	Mentor	11:00 a.m.	Kirkhof Center 2270
Heiss, Adam	Student	3:00 p.m.	Henry Hall Atrium 086
Helder, David	Student	12:30 p.m.	Kirkhof Center 1142
Helder, Sara	Student	2:00 p.m.	Henry Hall Atrium 091
Henderson-King, Donna	Mentor	9:00 a.m.	Henry Hall Atrium 074
Hendrick, Andrea	Student	9:00 a.m.	Henry Hall Atrium 017
Henke, Dellas	Mentor	9:00 a.m.	MIP Library Exhibition Space 02
Henke, Dellas	Mentor	9:00 a.m.	MIP Library Exhibition Space 04
Henke, Dellas	Mentor	9:00 a.m.	MIP Library Exhibition Space 03
Hennells, Amanda	Student	11:00 a.m.	Kirkhof Center 1104
Hensel, Jacklyn	Student	10:00 a.m.	Henry Hall Atrium 075
Henshaw, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 065
Henshaw, Michael	Mentor	9:00 a.m.	Henry Hall Atrium 046
Henshaw, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 088
Henshaw, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 080
Herpick, Emilie	Student	1:00 p.m.	Kirkhof Center 2215
Herrington, Deborah	Mentor	9:00 a.m.	Kirkhof Center GRR 135
Herrington, Deborah	Mentor	9:00 a.m.	Kirkhof Center GRR 060
Herrod, Christina	Student	2:00 p.m.	Kirkhof Center 2266
Heyboer, Stephen	Student	1:30 p.m.	Kirkhof Center 1104
Hicks, Leslie	Student	3:00 p.m.	Henry Hall Atrium 059

Hieftje, Brad	Student	9:00 a.m.	Kirkhof Center 2270
Higbea, Raymond	Mentor	9:00 a.m.	Henry Hall Atrium 100
Hiles, Sean	Student	9:00 a.m.	Kirkhof Center GRR 041
Hill, Marissa	Student	11:00 a.m.	Kirkhof Center 2215
Hillsamer, Aaron	Student	11:00 a.m.	Kirkhof Center GRR 032
Hindeleh, Firas	Mentor	9:00 a.m.	Kirkhof Center GRR 003
Hindeleh, Firas	Mentor	9:00 a.m.	Kirkhof Center GRR 114
Hobson, Erica	Student	11:00 a.m.	Kirkhof Center GRR 017
Hodges, Shanell	Student	10:00 a.m.	Kirkhof Center 1104
Hohman, Emily	Student	1:00 p.m.	Henry Hall Atrium 075
Hohn, DeAnna	Student	11:30 a.m.	Kirkhof Center 2215
Holder, Benjamin	Mentor	9:00 a.m.	Henry Hall Atrium 084
Holder, Benjamin	Mentor	9:00 a.m.	Kirkhof Center GRR 034
Hollister, Robert	Mentor	9:00 a.m.	Kirkhof Center GRR 056
Holloway, Timothy	Student	11:00 a.m.	Kirkhof Center GRR 132
Hoogewerf, Stephen	Student	9:00 a.m.	MIP Library Exhibition Space 11
Hoogewerf, Stephen	Student	4:00 p.m.	MIP Library Multipurpose Room
Houghton-Rahrig PhD RN, Lori	Mentor	9:00 a.m.	Kirkhof Center GRR 098
Howlett, John	Student	10:00 a.m.	Henry Hall Atrium 089
Hoxie, Patrick	Student	11:00 a.m.	Henry Hall Atrium 071
Hubbard, Sultan	Student	9:30 a.m.	Kirkhof Center 2266
Hudson, Michael	Student	2:00 p.m.	Kirkhof Center GRR 046
Hughey, Brandon	Student	9:00 a.m.	Henry Hall Atrium 064
Huisingh, Nicholas	Student	11:00 a.m.	Henry Hall Atrium 066
Huizen, Richard	Student	2:00 p.m.	Henry Hall Atrium 081
Hunt, Jodee	Mentor	9:00 a.m.	Henry Hall Atrium 024
Hurley, Michael	Student	4:30 p.m.	Kirkhof Center 2263

I

Ibarra, Marina	Student	2:00 p.m.	Kirkhof Center GRR 002
Ingalls, Emily	Student	9:00 a.m.	Kirkhof Center GRR 011
Ivan, Sarah	Student	10:00 a.m.	Kirkhof Center GRR 038

J

Jackson, Luke	Student	10:00 a.m.	Kirkhof Center GRR 127
Jacobs, Brittany	Student	10:00 a.m.	Kirkhof Center GRR 112
Jacquot, Joseph	Mentor	9:00 a.m.	Kirkhof Center GRR 006
Jacquot, Joseph	Mentor	9:00 a.m.	Kirkhof Center GRR 085
Janes, Patricia	Mentor	9:00 a.m.	Henry Hall Atrium 031
Jess, Jennifer	Student	12:00 p.m.	Kirkhof Center GRR 039

Jimenez, Hanzo	Student	9:00 a.m.	Kirkhof Center GRR 103
Johnson, Danielle	Student	11:00 a.m.	Kirkhof Center GRR 090

K

Kalafut, Andrew	Mentor	9:00 a.m.	Kirkhof Center GRR 123
Kalafut, Andrew	Mentor	9:00 a.m.	Kirkhof Center GRR 143
Kamps, Madeline	Student	9:00 a.m.	Kirkhof Center GRR 106
Kapustka, Darren	Student	10:00 a.m.	Henry Hall Atrium 015
Karbownik, Steven	Student	4:30 p.m.	Kirkhof Center 2266
Karcher, Kara	Student	12:30 p.m.	Kirkhof Center 2215
Karpen, Mary	Mentor	9:00 a.m.	Kirkhof Center GRR 127
Karpen, Mary	Mentor	3:30 p.m.	Kirkhof Center 2270
Kastura, Michaela	Student	10:00 a.m.	Kirkhof Center GRR 094
Katerberg, Victoria	Student	10:00 a.m.	Kirkhof Center GRR 053
Kavanagh, Kathleen	Student	9:00 a.m.	Kirkhof Center GRR 111
Kayfish, Alex	Student	12:00 p.m.	Kirkhof Center GRR 065
Kayfish, Elizabeth	Student	9:00 a.m.	Kirkhof Center GRR 111
Keb, Gabrielle	Student	1:00 p.m.	Henry Hall Atrium 096
Keenan-Whittemore, Kailey	Student	11:00 a.m.	Kirkhof Center 2201
Keenlance, Paul	Mentor	9:00 a.m.	Kirkhof Center GRR 006
Kelly, Samuel	Student	4:00 p.m.	Henry Hall Atrium 048
Kelly, Shana	Student	3:00 p.m.	Henry Hall Atrium 049
Keydel, Stacy	Student	11:00 a.m.	Kirkhof Center GRR 001
Khoo, Sok Kean	Mentor	9:00 a.m.	Henry Hall Atrium 035
Khoo, Sok Kean	Mentor	9:00 a.m.	Kirkhof Center GRR 072
Khoo, Sok Kean	Mentor	12:30 p.m.	Kirkhof Center 2263
Khudhur, Basma	Student	12:00 p.m.	Henry Hall Atrium 005
Kim, Johnathon	Student	2:00 p.m.	Kirkhof Center GRR 075
Kimboko, Priscilla	Mentor	9:00 a.m.	Henry Hall Atrium 100
King, Audrey	Student	9:00 a.m.	MIP Library Exb. Space 18 - DC
Klamer, Zachary	Student	2:00 p.m.	Henry Hall Atrium 102
Kloe, Ricky	Student	10:00 a.m.	Kirkhof Center GRR 044
Kneeshaw, Tara	Mentor	9:00 a.m.	Henry Hall Atrium 103
Kneeshaw, Tara	Mentor	9:00 a.m.	Kirkhof Center GRR 093
Kneisel, Tina	Student	3:00 p.m.	Kirkhof Center GRR 025
Knochel, Heather	Student	10:30 a.m.	Kirkhof Center 2215
Knoper, Logan	Student	10:00 a.m.	Henry Hall Atrium 103
Koerner, Kelly	Student	3:00 p.m.	Henry Hall Atrium 032
Komarzec, Elyse	Student	1:00 p.m.	Kirkhof Center GRR 107

Konen, Elizabeth	Student	2:00 p.m.	MIP Library Multipurpose Room
Koning, Simeon	Student	11:00 a.m.	Kirkhof Center GRR 001
Kopperl, Sheldon	Mentor	10:00 a.m.	Kirkhof Center 2263
Korich, Andrew	Mentor	9:00 a.m.	Henry Hall Atrium 094
Korich, Andrew	Mentor	9:00 a.m.	Kirkhof Center GRR 121
Korich, Andrew	Mentor	9:00 a.m.	Kirkhof Center GRR 120
Kosak, Talon	Student	11:00 a.m.	Henry Hall Atrium 094
Kosten, Daniel	Student	9:00 a.m.	Kirkhof Center GRR 114
Kovacs, Dalila	Mentor	9:00 a.m.	Kirkhof Center 2201
Kovacs, Dalila	Mentor	9:00 a.m.	Kirkhof Center GRR 137
Kovacs, Dalila	Mentor	11:30 a.m.	Kirkhof Center 2270
Kraus, Taylor	Student	10:00 a.m.	Henry Hall Atrium 030
Krikke, Kathryn	Student	10:00 a.m.	Henry Hall Atrium 056
Kroeze, Taylor	Student	2:00 p.m.	Henry Hall Atrium 042
Kruk, Katie	Student	10:00 a.m.	Kirkhof Center GRR 034
Krupp, Kara	Student	9:00 a.m.	Kirkhof Center GRR 085
Krygsheld, Jordan	Student	1:00 p.m.	Kirkhof Center GRR 084
Kulfan, Brennan	Student	3:00 p.m.	Henry Hall Atrium 019
Kunnen, Eric	Mentor	9:00 a.m.	Henry Hall Atrium 062
Kurjiaka, David	Mentor	9:00 a.m.	Kirkhof Center GRR 132
Kurjiaka, David	Mentor	9:00 a.m.	Kirkhof Center GRR 082
Kwekel, Carrie	Student	10:30 a.m.	Kirkhof Center 2215

L

Labeff, Molly	Student	9:00 a.m.	Library Main Floor Video Display
Lake, Danielle	Mentor	9:00 a.m.	Henry Hall Atrium 047
Lake, Danielle	Mentor	9:00 a.m.	Kirkhof Center GRR 102
Lakey, Brian	Mentor	9:30 a.m.	Kirkhof Center 2266
Lamar, Sarah	Student	11:00 a.m.	Henry Hall Atrium 078
Lammers, Kelsey	Student	12:30 p.m.	Kirkhof Center 2270
Lange, Susanna	Student	9:00 a.m.	Kirkhof Center GRR 141
Lange, Susanna	Student	1:00 p.m.	Kirkhof Center 2270
Lantz, Andrew	Mentor	9:00 a.m.	Kirkhof Center GRR 037
Lantz, Andrew	Mentor	9:00 a.m.	Kirkhof Center GRR 032
Larabee, Dexter	Student	9:00 a.m.	Kirkhof Center GRR 144
Larson, Kara	Student	12:00 p.m.	Kirkhof Center GRR 058
Law, Samantha	Student	2:00 p.m.	Henry Hall Atrium 023
LeFebre, Claire	Student	9:00 a.m.	Kirkhof Center GRR 126
Leach, Erin	Student	10:00 a.m.	Henry Hall Atrium 063

Leahy, Katelin	Student	12:00 p.m.	Henry Hall Atrium 028
Leahy, Katelin	Student	11:00 a.m.	Kirkhof Center GRR 008
Lear, Alan	Student	10:00 a.m.	Kirkhof Center GRR 136
Lee, Hoon	Mentor	9:00 a.m.	MIP Library Exhibition Space 12
Lee, SeoHee	Student	9:00 a.m.	MIP Library Exhibition Space 05
Lehman, Marc	Student	1:00 p.m.	Kirkhof Center GRR 138
Lehman, Marc	Student	11:00 a.m.	Kirkhof Center GRR 083
Leidig, Jonathan	Mentor	9:00 a.m.	Henry Hall Atrium 060
Leidig, Jonathan	Mentor	9:00 a.m.	Kirkhof Center GRR 063
Lenters, Geoffrey	Mentor	9:00 a.m.	Henry Hall Atrium 081
Leonard, David	Mentor	9:00 a.m.	Henry Hall Atrium 027
Lewis, Taylor	Student	10:00 a.m.	Kirkhof Center 2201
Lind, Lacie	Student	11:00 a.m.	Kirkhof Center GRR 009
Lindale, Jacob	Student	9:00 a.m.	Kirkhof Center 2201
Linn, David	Mentor	9:00 a.m.	Kirkhof Center GRR 145
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 049
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 126
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 125
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 146
Lioubimtseva, Elena	Mentor	9:00 a.m.	Kirkhof Center GRR 144
Lioubimtseva, Elena	Mentor	9:00 a.m.	Henry Hall Atrium 018
Lioubimtseva, Elena	Mentor	9:00 a.m.	Henry Hall Atrium 044
Lioubimtseva, Elena	Mentor	9:00 a.m.	Henry Hall Atrium 092
Lioubimtseva, Elena	Mentor	11:00 a.m.	Kirkhof Center 2201
Livingston, Anne	Student	2:00 p.m.	MIP Library Multipurpose Room
Locher, Alexandra	Mentor	2:30 p.m.	Kirkhof Center 1104
Lochrie, Arielle	Student	1:00 p.m.	Kirkhof Center GRR 145
Lockmiller, Kayla	Student	12:00 p.m.	Kirkhof Center GRR 093
Loewen, Stephanie	Student	4:00 p.m.	Kirkhof Center 2263
Lombardo, Michael	Mentor	9:00 a.m.	Henry Hall Atrium 026
Lombardo, Michael	Mentor	9:00 a.m.	Henry Hall Atrium 111
Lombardo, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 001
Lopez, Luis	Student	10:00 a.m.	Kirkhof Center GRR 069
Lord, Richard	Mentor	9:00 a.m.	Kirkhof Center GRR 067
Lord, Richard	Mentor	9:00 a.m.	Henry Hall Atrium 094
Lord, Richard	Mentor	9:00 a.m.	Kirkhof Center GRR 121
Lord, Richard	Mentor	9:00 a.m.	Henry Hall Atrium 093
Lord, Richard	Mentor	9:00 a.m.	Kirkhof Center GRR 120

Lou, Leon	Mentor	9:00 a.m.	Henry Hall Atrium 109
Lown, Deborah	Mentor	9:00 a.m.	Henry Hall Atrium 025
Lucille, Molly	Student	9:00 a.m.	MIP Library Exhibition Space 01
Lucille, Molly	Student	9:00 a.m.	MIP Library Exhibition Space 14
Luevano, Nicole	Student	10:00 a.m.	Henry Hall Atrium 107
Lukas, Matthew	Student	9:00 a.m.	Kirkhof Center GRR 063
Luzadre, Ashley	Student	12:00 p.m.	Henry Hall Atrium 020
Lydick, Dawn	Student	4:00 p.m.	Henry Hall Atrium 011
Lyon, Nicole	Student	2:00 p.m.	Henry Hall Atrium 026

M

Ma, Kin	Mentor	9:00 a.m.	Kirkhof Center GRR 140
Ma, Kin	Mentor	9:00 a.m.	Kirkhof Center GRR 066
MacDonald, Neil	Mentor	9:00 a.m.	Kirkhof Center 2266
MacKay, Samantha	Student	2:00 p.m.	Henry Hall Atrium 098
Macauley, Beth	Mentor	9:00 a.m.	Kirkhof Center GRR 133
Macauley, Beth	Mentor	9:00 a.m.	Kirkhof Center GRR 147
Macauley, Beth	Mentor	9:00 a.m.	Henry Hall Atrium 079
Macauley, Emily	Student	2:00 p.m.	Kirkhof Center GRR 147
Madden, Gwyn	Mentor	9:00 a.m.	Kirkhof Center GRR 058
Madden, Tyler	Student	10:00 a.m.	Henry Hall Atrium 037
Malear, Elizabeth	Student	10:00 a.m.	Kirkhof Center GRR 019
Mallison, Alexandria	Student	4:00 p.m.	Henry Hall Atrium 068
Mangat, Tanveer	Student	3:00 p.m.	Henry Hall Atrium 028
Mardeusz, Thomas	Student	9:00 a.m.	Kirkhof Center GRR 045
Marion, Isaiah	Student	11:00 a.m.	Henry Hall Atrium 008
Martin, Stephen	Student	1:00 p.m.	Kirkhof Center GRR 065
Martinez, Dayne	Student	1:00 p.m.	Kirkhof Center GRR 061
Martus, Jarrett	Mentor	9:30 a.m.	Kirkhof Center 2201
Mathieu, Stacey	Student	1:00 p.m.	Henry Hall Atrium 074
Matthews, Ricky	Student	9:00 a.m.	Kirkhof Center GRR 105
Matuz, Jacob	Student	9:00 a.m.	Henry Hall Atrium 053
May, Kelsey	Student	12:00 p.m.	MIP Library Multipurpose Room
McAllister, Kathryn	Student	9:00 a.m.	MIP Library Exhibition Space 09
McBride, Carly	Student	12:30 p.m.	Kirkhof Center 2215
McBride, Mary	Student	1:00 p.m.	Kirkhof Center GRR 109
McCarrell, Nicole	Student	11:00 a.m.	Henry Hall Atrium 043
McCartney, Joseph	Student	3:00 p.m.	Henry Hall Atrium 086
McCray, Jatamia	Student	10:00 a.m.	Henry Hall Atrium 004

McGuffie, Emily	Student	3:00 p.m.	Kirkhof Center GRR 137
McGuire, Kari	Student	9:00 a.m.	Kirkhof Center GRR 138
McKee, Kimberly	Mentor	9:00 a.m.	Kirkhof Center GRR 078
Meiste, Megan	Student	9:00 a.m.	Kirkhof Center GRR 092
Mennenga, Anna	Student	9:00 a.m.	Henry Hall Atrium 052
Miazgowicz, Patrick	Student	10:00 a.m.	Henry Hall Atrium 105
Michael, Angela	Student	10:00 a.m.	Kirkhof Center GRR 049
Mico, Hannah	Student	9:30 a.m.	Kirkhof Center 1104
Middel, Mariah	Student	2:00 p.m.	Henry Hall Atrium 040
Mileva, Gloria	Student	2:00 p.m.	Kirkhof Center GRR 102
Miller, C'arra	Student	11:00 a.m.	Henry Hall Atrium 080
Miller, Casey	Student	9:00 a.m.	Kirkhof Center GRR 059
Miller, Jaren	Student	10:00 a.m.	Henry Hall Atrium 101
Miller, Meredith	Student	3:00 p.m.	Kirkhof Center GRR 089
Miller, Meredith	Student	1:00 p.m.	Henry Hall Atrium 061
Millner, Austin	Student	9:00 a.m.	Kirkhof Center GRR 023
Mishra, Bikash	Student	12:00 p.m.	Henry Hall Atrium 005
Mohr, Ian	Student	12:00 p.m.	Kirkhof Center GRR 052
Moll, Sarah	Student	3:00 p.m.	Henry Hall Atrium 049
Molla, Azizur	Mentor	9:00 a.m.	Kirkhof Center GRR 097
Montagna, Douglas	Mentor	9:30 a.m.	Kirkhof Center 2263
Moon, Charles	Student	10:00 a.m.	Kirkhof Center GRR 044
Moret, Zulema	Mentor	9:00 a.m.	Kirkhof Center GRR 025
Morgan, Maria	Student	11:00 a.m.	Kirkhof Center GRR 009
Morris, James	Student	11:00 a.m.	Kirkhof Center GRR 017
Morris, James	Student	10:00 a.m.	Kirkhof Center GRR 019
Morris, Katelyn	Student	9:00 a.m.	Kirkhof Center GRR 118
Morrison, Ian	Student	9:00 a.m.	Kirkhof Center GRR 059
Mostyn, Ryan	Student	1:00 p.m.	Kirkhof Center GRR 016
Mouland, Ryan	Student	10:00 a.m.	Henry Hall Atrium 105
Mowery, Myles	Student	9:00 a.m.	Henry Hall Atrium 076
Mulder, Crystal	Student	12:00 p.m.	Kirkhof Center GRR 090
Mulder, Jason	Student	1:00 p.m.	Kirkhof Center 2215
Mulder, Katelyn	Student	3:30 p.m.	Kirkhof Center 2270
Mullendore, Kristine	Mentor	2:00 p.m.	Kirkhof Center 2266
Murawski, Jamie	Student	10:00 a.m.	Henry Hall Atrium 038
Murphy, Kelsy	Student	10:00 a.m.	Henry Hall Atrium 101
Murray, Bailey	Student	2:30 p.m.	Kirkhof Center 1142

Murray, Ryan	Student	10:30 a.m.	Kirkhof Center 2263

N

Nardone, Alyssa	Student	10:00 a.m.	Henry Hall Atrium 058
Nauta, Kelsie	Student	12:00 p.m.	Henry Hall Atrium 110
Nauta, Kelsie	Student	1:00 p.m.	Kirkhof Center GRR 134
Nelson, Krista	Student	1:00 p.m.	Kirkhof Center 2215
Nguyen, Hoang Le	Student	3:00 p.m.	Henry Hall Atrium 082
Nichols, Joseph	Student	10:00 a.m.	Henry Hall Atrium 088
Nieuwkoop, Anthony	Mentor	9:00 a.m.	Kirkhof Center GRR 010
Nikitin, Alexey	Mentor	9:00 a.m.	Henry Hall Atrium 030
Nizielski, Steven	Mentor	9:00 a.m.	Henry Hall Atrium 038
Noordyke, Emily	Student	1:00 p.m.	Kirkhof Center GRR 065
Nordman, Erik	Mentor	9:00 a.m.	Kirkhof Center 1142
Nordman, Erik	Mentor	9:00 a.m.	Kirkhof Center GRR 115
Nordman, Erik	Mentor	9:30 a.m.	Kirkhof Center 1142
Nordman, Erik	Mentor	10:00 a.m.	Kirkhof Center 1142
Nordman, Erik	Mentor	10:30 a.m.	Kirkhof Center 1142
Nordman, Erik	Mentor	11:00 a.m.	Kirkhof Center 1142
Nordman, Erik	Mentor	11:30 a.m.	Kirkhof Center 1142
Nordman, Erik	Mentor	12:00 p.m.	Kirkhof Center 1142
Nordman, Erik	Mentor	1:00 p.m.	Kirkhof Center 1142
Nordman, Erik	Mentor	1:30 p.m.	Kirkhof Center 1142
Nordman, Erik	Mentor	2:00 p.m.	Kirkhof Center 1142
Nordman, Erik	Mentor	2:30 p.m.	Kirkhof Center 1142
Northup, Mel	Mentor	4:30 p.m.	Kirkhof Center 2266
Nystrom, Samuel	Student	9:00 a.m.	Kirkhof Center GRR 094
Nystrom, Samuel	Student	9:00 a.m.	Henry Hall Atrium 006

O

O'Boyle, Lawrence	Student	1:00 p.m.	Kirkhof Center GRR 123
O'Grady, Katelyn	Student	12:00 p.m.	Kirkhof Center GRR 097
Ocobock, Cara	Mentor	9:00 a.m.	Henry Hall Atrium 098
Ocobock, Cara	Mentor	9:00 a.m.	Kirkhof Center GRR 059
Ocobock, Cara	Mentor	9:00 a.m.	Henry Hall Atrium 097
Ocobock, Cara	Mentor	9:00 a.m.	Henry Hall Atrium 010
Ocobock, Cara	Mentor	9:00 a.m.	Kirkhof Center GRR 047
Ocobock, Cara	Mentor	9:00 a.m.	Henry Hall Atrium 090
Ocobock, Cara	Mentor	9:00 a.m.	Kirkhof Center GRR 048
Ocobock, Cara	Mentor	9:00 a.m.	Kirkhof Center GRR 036

Odendaal, Juane	Student	4:00 p.m.	Kirkhof Center 2215
Olson, Joshua	Student	11:00 a.m.	Henry Hall Atrium 071
Oneka, Morgan	Student	9:00 a.m.	Kirkhof Center GRR 063
Oneka, Morgan	Student	4:00 p.m.	Kirkhof Center 2263
Ongaro, Elena	Student	9:00 a.m.	Kirkhof Center GRR 045
Ophoff, Bradley	Student	11:00 a.m.	Kirkhof Center GRR 015
Orndorf, Nathaniel	Student	9:00 a.m.	Henry Hall Atrium 045
Osiptsov, Philipp	Student	9:00 a.m.	Henry Hall Atrium 009
Ostrow, Bruce	Mentor	9:00 a.m.	Henry Hall Atrium 057
Ostrow, Bruce	Mentor	9:30 a.m.	Kirkhof Center 2270
Overbeck, Aaron	Student	11:00 a.m.	Henry Hall Atrium 097

P

Palka, Jacqueline	Student	10:00 a.m.	Kirkhof Center 2215
Pardy, Luke	Student	1:00 p.m.	Kirkhof Center GRR 014
Park, Ernest	Mentor	9:00 a.m.	Henry Hall Atrium 014
Parker, Jonathan	Student	9:00 a.m.	Kirkhof Center GRR 041
Patel, Osman	Mentor	9:00 a.m.	Kirkhof Center GRR 014
Patti, Gabriella	Student	2:00 p.m.	Kirkhof Center 2263
Paulosky, Andrew	Student	9:00 a.m.	Henry Hall Atrium 076
Pearce, Nicholas	Student	11:00 a.m.	Kirkhof Center 1142
Pearl, Christopher	Mentor	9:00 a.m.	Henry Hall Atrium 096
Pearson, Eric	Student	10:00 a.m.	Henry Hall Atrium 097
Pecoraro, Anthony	Student	2:00 p.m.	Kirkhof Center GRR 003
Peebles, Ellenor	Student	10:00 a.m.	Henry Hall Atrium 107
Peet, Caylie	Student	12:00 p.m.	Henry Hall Atrium 031
Pelkey, Jesse	Student	12:00 p.m.	Henry Hall Atrium 108
Pentecost, Thomas	Mentor	9:00 a.m.	Henry Hall Atrium 058
Pepper, Jael	Student	9:30 a.m.	Kirkhof Center 2215
Perrien, Alexandra	Student	4:00 p.m.	Kirkhof Center 2215
Persoon, James	Mentor	12:00 p.m.	MIP Library Multipurpose Room
Peruzzi, Christopher	Student	2:00 p.m.	Kirkhof Center GRR 051
Peterson, Denise	Student	11:00 a.m.	Kirkhof Center GRR 066
Peterson, Grace	Student	12:00 p.m.	Kirkhof Center GRR 145
Petrenko, Anton	Student	12:00 p.m.	Henry Hall Atrium 097
Petrenko, Anton	Student	9:00 a.m.	Henry Hall Atrium 009
Phan, Lance	Student	12:00 p.m.	Henry Hall Atrium 108
Philipps, Keziah	Student	9:00 a.m.	MIP Library Exhibition Space 04
Pickrum, Adam	Student	9:00 a.m.	Kirkhof Center GRR 142

Pickrum, Adam	Student	10:00 a.m.	Kirkhof Center GRR 081
Pickrum, Adam	Student	9:00 a.m.	Kirkhof Center GRR 091
Pietrzak, Heather	Student	10:00 a.m.	Kirkhof Center GRR 079
Pillivant, Daniel	Student	2:00 p.m.	Kirkhof Center GRR 075
Pink, Ciara	Student	9:00 a.m.	Henry Hall Atrium 112
Piotrzkowski, Brandon	Student	10:00 a.m.	Henry Hall Atrium 033
Pipe, Megan	Student	1:00 p.m.	Henry Hall Atrium 075
Pisto, Virginia	Student	9:00 a.m.	MIP Library Exhibition Space 12
Pohler, Allie	Student	9:00 a.m.	Kirkhof Center GRR 035
Pokora, Isabelle	Student	9:00 a.m.	Henry Hall Atrium 052
Poortvliet, Dave	Mentor	9:00 a.m.	Henry Hall Atrium 082
Portwood, Brooke	Student	10:00 a.m.	Henry Hall Atrium 004
Post, Jacqueline	Student	12:30 p.m.	Kirkhof Center 2215
Potteiger, Jeffrey	Mentor	9:00 a.m.	Henry Hall Atrium 029
Powell, Brianna	Student	10:00 a.m.	Kirkhof Center GRR 028
Powell, Brianna	Student	9:00 a.m.	Henry Hall Atrium 099
Powers, Rachel	Mentor	9:00 a.m.	Henry Hall Atrium 080
Pretto, Jordan	Student	11:00 a.m.	Henry Hall Atrium 097
Prieskorn, Brooke	Student	1:00 p.m.	Kirkhof Center 2266

Q

Qi, Min	Mentor	9:00 a.m.	Kirkhof Center GRR 093
Quamme, Joel	Mentor	9:00 a.m.	Kirkhof Center GRR 086
Quinn, Kevin	Student	9:00 a.m.	Henry Hall Atrium 090

R

Radecki, Connor	Student	2:00 p.m.	Kirkhof Center GRR 037
Ramanathan, Pavithra	Student	12:00 p.m.	Henry Hall Atrium 005
Ramsson, Eric	Mentor	9:00 a.m.	Henry Hall Atrium 037
Rann, Stephanie	Student	1:00 p.m.	Henry Hall Atrium 074
Rapp, Ashley	Student	9:00 a.m.	Kirkhof Center GRR 055
Rarick, Alexander	Student	9:00 a.m.	Kirkhof Center GRR 041
Rayor, Diane	Mentor	9:00 a.m.	Kirkhof Center GRR 035
Reahm, Matthew	Student	10:00 a.m.	Kirkhof Center GRR 053
Rebello Lima, Vinicius	Mentor	9:00 a.m.	MIP Library Exhibition Space 05
Rebello Lima, Vinicius	Mentor	9:00 a.m.	MIP Library Exhibition Space 07
Reffeor, Wendy	Mentor	9:00 a.m.	Henry Hall Atrium 013
Reminga, Katy	Student	1:00 p.m.	Kirkhof Center GRR 076
Remski, Lindsey	Student	9:00 a.m.	Kirkhof Center GRR 090
Reynolds, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 052

Rhoads, Russell	Mentor	9:00 a.m.	Kirkhof Center GRR 138
Ricco, Michael	Mentor	9:00 a.m.	Henry Hall Atrium 056
Richards, Jonathon	Student	4:00 p.m.	Kirkhof Center 2201
Richter, Tani	Student	9:00 a.m.	Kirkhof Center GRR 140
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 089
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 041
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 088
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 004
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 124
Riemersma, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 101
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 044
Rigterink, Karlee	Student	9:30 a.m.	Kirkhof Center 2215
Ripley, Aaron	Student	10:00 a.m.	Kirkhof Center GRR 072
Ritchie, Elizabeth	Student	9:00 a.m.	Kirkhof Center GRR 085
Roberts, Kailey	Student	11:00 a.m.	Kirkhof Center 2215
Robinson, Chehallis	Student	3:30 p.m.	Kirkhof Center 2201
Robinson, Travis	Student	1:00 p.m.	Kirkhof Center GRR 022
Rodawold, Megan	Student	2:00 p.m.	Kirkhof Center 2201
Rohr, Caleb	Student	9:00 a.m.	Kirkhof Center GRR 103
Ronspees, Austin	Student	10:00 a.m.	Kirkhof Center GRR 054
Rosenberg, Aaron	Student	10:00 a.m.	Kirkhof Center GRR 050
Rosenblat, Alexa	Student	10:00 a.m.	Kirkhof Center 2215
Roth, Chelsey	Student	10:00 a.m.	Henry Hall Atrium 101
Royston, Whitney	Student	11:30 a.m.	Kirkhof Center 2215
Rumschlag, Jaco	Student	11:00 a.m.	Kirkhof Center GRR 056
Rupe, Kristen	Student	3:00 p.m.	Henry Hall Atrium 082
Russell, Amy	Mentor	9:00 a.m.	Kirkhof Center 2263
Russo, Tracy	Mentor	9:00 a.m.	Henry Hall Atrium 072
Ruvina, Kristi	Student	12:00 p.m.	Kirkhof Center GRR 040

S

Sackett, Amanda	Student	11:00 a.m.	Kirkhof Center 2263
Sackett, Blaine	Student	9:00 a.m.	Kirkhof Center GRR 105
Saghaiepour, Cameron	Student	12:30 p.m.	Kirkhof Center 2201
Saikalis, Christopher	Student	12:00 p.m.	Henry Hall Atrium 109
Sall, Chelsey	Student	9:00 a.m.	MIP Library Exhibition Space 12
Sample, Laura	Student	10:00 a.m.	Henry Hall Atrium 047
Sanders, Dane	Student	11:00 a.m.	Kirkhof Center GRR 015
Sanders, Victoria	Student	12:00 p.m.	Kirkhof Center GRR 096

Sass, Georgette	Mentor	9:00 a.m.	Henry Hall Atrium 052
Sass, Georgette	Mentor	12:30 p.m.	Kirkhof Center 2270
Sass, Georgette	Mentor	4:00 p.m.	Kirkhof Center 2201
Saukas, Elizabete	Student	11:00 a.m.	Henry Hall Atrium 100
Scantlebury, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 042
Scantlebury, Michael	Mentor	9:00 a.m.	Henry Hall Atrium 085
Schaible, Crystal	Student	11:30 a.m.	Kirkhof Center 2215
Schaner, Haley	Student	2:00 p.m.	Kirkhof Center GRR 057
Schmaltz, Karyn	Student	10:00 a.m.	Henry Hall Atrium 010
Schnyders, Harold	Mentor	9:00 a.m.	Henry Hall Atrium 069
Schnyders, Harold	Mentor	9:00 a.m.	Kirkhof Center GRR 128
Scholl, Jennifer	Student	9:00 a.m.	Kirkhof Center 1104
Schra, Jenna	Student	12:00 p.m.	Kirkhof Center GRR 073
Schroder, Emma	Student	12:00 p.m.	Henry Hall Atrium 027
Schroeder, Nikolaus	Student	3:30 p.m.	Kirkhof Center 2263
Schroedter, Lindsey	Student	9:00 a.m.	Kirkhof Center GRR 145
Schwartz, Tyler	Student	1:00 p.m.	Kirkhof Center GRR 033
Scott, Cornelius	Student	9:00 a.m.	Kirkhof Center GRR 132
Seley, Beverly	Mentor	9:00 a.m.	Library Exhibition Space 18 - DC
Seley, Beverly	Mentor	9:00 a.m.	MIP Library Exhibition Space 15
Shaner, Alexandra	Student	10:00 a.m.	Kirkhof Center GRR 019
Shannon, Brandon	Student	11:00 a.m.	Henry Hall Atrium 062
Shaver, Nicholas	Student	1:00 p.m.	Henry Hall Atrium 046
Sheridan, Stephanie	Student	11:30 a.m.	Kirkhof Center 2215
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 007
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 104
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 023
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 106
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 008
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 084
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 105
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 070
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 043
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 009
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 012
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 018
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 029
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 107

Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 090
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 017
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 016
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 108
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 113
Sherman, Ross	Mentor	9:00 a.m.	Kirkhof Center GRR 045
Shinde, Sapana	Student	10:00 a.m.	Kirkhof Center GRR 072
Shlaffer, Sara	Student	2:00 p.m.	Kirkhof Center GRR 125
Shoemaker, Allison	Student	9:30 a.m.	Kirkhof Center 2215
Sicilian, Paul	Mentor	9:00 a.m.	Henry Hall Atrium 003
Siciliano, Timothy	Student	11:00 a.m.	Kirkhof Center GRR 026
Sika, Carley	Student	10:00 a.m.	Kirkhof Center GRR 012
Simonelli, Emily	Student	10:00 a.m.	Kirkhof Center GRR 012
Sinclair, Matthew	Student	9:00 a.m.	Kirkhof Center GRR 119
Sinclair, Matthew	Student	11:00 a.m.	Henry Hall Atrium 001
Siroonian, Kathryn	Student	1:00 p.m.	Kirkhof Center GRR 016
Slaughter, Daniel	Mentor	4:30 p.m.	Kirkhof Center 2263
Small, Shelbi	Student	4:00 p.m.	Kirkhof Center 1104
Smit, Ann	Student	10:00 a.m.	Kirkhof Center 2215
Smith, Margaret	Student	9:00 a.m.	Kirkhof Center GRR 111
Smith, Shelly	Mentor	1:00 p.m.	Kirkhof Center 2270
Smith, Stafford	Mentor	9:00 a.m.	MIP Library Exhibition Space 19
Smither, David	Student	10:00 a.m.	Kirkhof Center 2270
Smither, James	Mentor	10:00 a.m.	Kirkhof Center 2201
Smither, James	Mentor	10:00 a.m.	Kirkhof Center 2270
Smither, James	Mentor	4:00 p.m.	Kirkhof Center 2266
Snarski, Skyla	Student	4:00 p.m.	Henry Hall Atrium 018
Soto, Selena	Student	1:00 p.m.	Kirkhof Center GRR 087
Southerland, Brooke	Student	10:00 a.m.	Kirkhof Center GRR 036
Spangenberg, Nathan	Student	9:00 a.m.	MIP Library Exhibition Space 07
Spidle, Audrey	Student	9:00 a.m.	Henry Hall Atrium 085
Spoelstra, Sandra	Mentor	9:00 a.m.	Henry Hall Atrium 002
Sridhar, Suganthi	Mentor	9:00 a.m.	Henry Hall Atrium 005
Sridhar, Suganthi	Mentor	9:00 a.m.	Kirkhof Center GRR 002
St Louis, Scott	Student	9:00 a.m.	Kirkhof Center GRR 095
Stark, David	Mentor	12:00 p.m.	Kirkhof Center 2270
Stehouwer, Joseph	Student	3:00 p.m.	Kirkhof Center GRR 073
Stein, Alexander	Student	10:30 a.m.	Kirkhof Center 1104

Steinman, Alan	Mentor	9:00 a.m.	Kirkhof Center GRR 112
Stephenson, Paul	Mentor	10:30 a.m.	Kirkhof Center 2201
Stevens, Amanda	Student	9:00 a.m.	Kirkhof Center GRR 132
Stewart, Jennifer	Mentor	9:00 a.m.	Kirkhof Center GRR 013
Stewart, Jennifer	Mentor	12:30 p.m.	Kirkhof Center 2201
Stewart, Titania	Student	4:30 p.m.	Kirkhof Center 1104
Stine, Andrew	Student	11:00 a.m.	Henry Hall Atrium 062
Stoneburner, Paige	Student	9:00 a.m.	Kirkhof Center GRR 131
Stoskopf, Christopher	Student	12:00 p.m.	Kirkhof Center 1142
Strickler, Timothy	Mentor	9:00 a.m.	Henry Hall Atrium 098
Strickler, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 059
Strickler, Timothy	Mentor	9:00 a.m.	Henry Hall Atrium 097
Strickler, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 047
Strickler, Timothy	Mentor	9:00 a.m.	Henry Hall Atrium 090
Strickler, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 048
Strickler, Timothy	Mentor	9:00 a.m.	Kirkhof Center GRR 036
Stroik, Laura	Mentor	9:00 a.m.	Henry Hall Atrium 098
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 059
Stroik, Laura	Mentor	9:00 a.m.	Henry Hall Atrium 040
Stroik, Laura	Mentor	9:00 a.m.	Henry Hall Atrium 097
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 047
Stroik, Laura	Mentor	9:00 a.m.	Henry Hall Atrium 090
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 048
Stroik, Laura	Mentor	9:00 a.m.	Kirkhof Center GRR 036
Strom, Mackenzie	Student	4:00 p.m.	Henry Hall Atrium 070
Suess, Timothy	Student	10:00 a.m.	Kirkhof Center GRR 044
Sun, Wanxiao	Mentor	9:00 a.m.	Kirkhof Center GRR 043
Sun, Wanxiao	Mentor	9:00 a.m.	Henry Hall Atrium 017
Sun, Wanxiao	Mentor	9:00 a.m.	Kirkhof Center GRR 115
Sweet, Rose	Student	4:00 p.m.	Henry Hall Atrium 048
Sylvester, Francis	Mentor	9:00 a.m.	Kirkhof Center GRR 094
Sylvester, Francis	Mentor	9:00 a.m.	Henry Hall Atrium 009
Sylvester, Francis	Mentor	9:00 a.m.	Henry Hall Atrium 006
Sylvester, Francis	Mentor	9:00 a.m.	Kirkhof Center GRR 015
Szala, Jordan	Student	9:00 a.m.	MIP Library Exhibition Space 02
Szala, Jordan	Student	9:00 a.m.	MIP Library Exhibition Space 13
Szarecka, Agnieszka	Mentor	9:00 a.m.	Henry Hall Atrium 102
Szostak, Kaitlyn	Student	9:00 a.m.	Kirkhof Center GRR 119

T

Tackett, Scott	Student	10:00 a.m.	Henry Hall Atrium 101
Tallman, Melissa	Mentor	9:00 a.m.	Kirkhof Center GRR 057
Tallman, Melissa	Mentor	9:00 a.m.	Kirkhof Center GRR 116
Tallman, Melissa	Mentor	9:00 a.m.	Henry Hall Atrium 087
Tanis, Stephanie	Student	9:00 a.m.	Kirkhof Center GRR 060
Tarbutton, Audrey	Student	9:00 a.m.	Kirkhof Center GRR 055
Taylor, Merritt	Mentor	9:00 a.m.	Kirkhof Center GRR 061
Taylor, Merritt	Mentor	9:00 a.m.	Henry Hall Atrium 039
Taylor, Merritt	Mentor	9:00 a.m.	Henry Hall Atrium 066
Taylor, Robert	Student	11:30 a.m.	Kirkhof Center 1142
Teall, Annie	Student	9:00 a.m.	MIP Library Exhibition Space 06
TenHoor, Amy	Student	9:00 a.m.	Kirkhof Center GRR 132
terHorst, Keith	Student	3:00 p.m.	Kirkhof Center 1104
Terwilliger, Adam	Student	9:00 a.m.	Kirkhof Center GRR 063
Thomas, Nicole	Student	10:30 a.m.	Kirkhof Center 2215
Thompson, Anthony	Mentor	9:00 a.m.	MIP Library Exhibition Space 08
Thompson, Anthony	Mentor	9:00 a.m.	MIP Library Exhibition Space 10
Thompson, Brian	Student	9:00 a.m.	Kirkhof Center GRR 090
Thompson, Brian	Student	1:00 p.m.	Kirkhof Center GRR 016
Thompson, Cynthia	Mentor	9:00 a.m.	Kirkhof Center GRR 074
Thompson, Cynthia	Mentor	9:00 a.m.	Henry Hall Atrium 098
Thompson, Cynthia	Mentor	9:00 a.m.	Kirkhof Center GRR 059
Thompson, Cynthia	Mentor	9:00 a.m.	Kirkhof Center GRR 028
Thompson, Cynthia	Mentor	9:00 a.m.	Henry Hall Atrium 097
Thompson, Cynthia	Mentor	9:00 a.m.	Kirkhof Center GRR 047
Thompson, Cynthia	Mentor	9:00 a.m.	Henry Hall Atrium 090
Thompson, Cynthia	Mentor	9:00 a.m.	Kirkhof Center GRR 048
Thompson, Cynthia	Mentor	9:00 a.m.	Henry Hall Atrium 099
Thompson, Cynthia	Mentor	9:00 a.m.	Kirkhof Center GRR 036
Thompson, Ian	Student	9:00 a.m.	MIP Library Exhibition Space 11
Thompson, Ian	Student	4:00 p.m.	MIP Library Multipurpose Room
Thompson, Jillian	Student	9:00 a.m.	MIP Library Exhibition Space 15
Thorbjornsen, Scott	Student	9:00 a.m.	Kirkhof Center GRR 133
Thorgaard, Scott	Mentor	9:00 a.m.	Kirkhof Center GRR 051
Thorgaard, Scott	Mentor	9:00 a.m.	Kirkhof Center GRR 054
Thornton, Sarah	Student	9:00 a.m.	Henry Hall Atrium 012
Thorpe, Patrick	Mentor	9:00 a.m.	Kirkhof Center GRR 022

Thorpe, Patrick	Mentor	9:00 a.m.	Henry Hall Atrium 111
Thurkettle, Sara	Student	10:00 a.m.	Henry Hall Atrium 088
Tibble, Sarah	Student	10:00 a.m.	Kirkhof Center GRR 021
Tibble, Sarah	Student	9:00 a.m.	Henry Hall Atrium 079
Tjapkes, Daniel	Student	10:00 a.m.	Kirkhof Center GRR 067
Tollefson, Travis	Student	10:00 a.m.	Kirkhof Center GRR 038
Toot, Jane	Mentor	9:00 a.m.	Kirkhof Center GRR 107
Toth, Miranda	Student	10:30 a.m.	Kirkhof Center 2266
Trier, Terry	Mentor	9:00 a.m.	Henry Hall Atrium 078
Tumbarella, Ellen	Student	11:00 a.m.	Kirkhof Center GRR 010
Tunstall, Dwayne	Mentor	10:30 a.m.	Kirkhof Center 2270
Turner, Brian	Student	2:30 p.m.	Kirkhof Center 1104
Tusch, Guenter	Mentor	9:00 a.m.	Henry Hall Atrium 060
Tusch, Guenter	Mentor	1:30 p.m.	Kirkhof Center 2266

U

Uhl, Katie	Student	12:00 p.m.	Henry Hall Atrium 005
Urena-Gonzalez, Kenny	Student	2:00 p.m.	Henry Hall Atrium 041

V

Vallery, Richard	Mentor	9:00 a.m.	Henry Hall Atrium 045
Vallery, Richard	Mentor	9:00 a.m.	Henry Hall Atrium 050
Van De Kraats, Jordan	Student	9:00 a.m.	Kirkhof Center GRR 129
van Noort, Charlotte	Student	9:00 a.m.	Kirkhof Center GRR 074
van Noort, Charlotte	Student	9:00 a.m.	Henry Hall Atrium 076
VanGessel, Natasha	Student	9:00 a.m.	MIP Library Exhibition Space 08
VanOss, Heather	Student	9:00 a.m.	Kirkhof Center GRR 092
VanVeldhuisen, Taylor	Student	9:00 a.m.	Kirkhof Center GRR 029
VandenPlas, Jessica	Mentor	9:00 a.m.	Kirkhof Center GRR 101
VandenPlas, Jessica	Mentor	9:00 a.m.	Kirkhof Center GRR 135
VandenPlas, Jessica	Mentor	9:00 a.m.	Henry Hall Atrium 022
Vander Weide, Grace	Student	12:00 p.m.	Kirkhof Center GRR 110
VanderMolen, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 029
VanderMolen, Julia	Mentor	9:00 a.m.	Henry Hall Atrium 068
VanderMolen, Julia	Mentor	9:00 a.m.	Henry Hall Atrium 011
VanderMolen, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 131
VanderMolen, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 053
VanderMolen, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 005
VanderMolen, Julia	Mentor	9:00 a.m.	Henry Hall Atrium 032
VanderMolen, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 097

VanderMolen, Julia	Mentor	9:00 a.m.	Henry Hall Atrium 042
VanderMolen, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 020
Vanoosten, Nicholas	Student	3:00 p.m.	Kirkhof Center GRR 098
Veenstra, Victoria	Mentor	9:00 a.m.	MIP Library Exhibition Space 08
Veenstra, Victoria	Mentor	9:00 a.m.	MIP Library Exhibition Space 10
Veitengruber, Nicholas	Student	9:00 a.m.	Henry Hall Atrium 106
VerMerris, Kathryn	Student	9:00 a.m.	Henry Hall Atrium 106
Versluis, Eric	Student	11:00 a.m.	Kirkhof Center GRR 001
Vessey, David	Mentor	9:00 a.m.	Henry Hall Atrium 048
Vettori, Angela	Student	9:00 a.m.	Kirkhof Center GRR 104
Vincent, Kathryn	Student	11:30 a.m.	Kirkhof Center 2215
Voisin, Valerie	Student	10:00 a.m.	Henry Hall Atrium 089

W

Wackerle, Brandon	Student	10:00 a.m.	Henry Hall Atrium 063
Walker, Thomas	Mentor	2:00 p.m.	Kirkhof Center 2201
Wallace, Heather	Mentor	9:00 a.m.	Henry Hall Atrium 036
Waller, Caitlyn	Student	9:00 a.m.	Kirkhof Center GRR 105
Wallich, Marie	Student	3:00 p.m.	Henry Hall Atrium 077
Walstra, Addison	Student	11:00 a.m.	Henry Hall Atrium 008
Walters, Christopher	Student	9:00 a.m.	Kirkhof Center 1142
Walters, Kaylin	Student	10:00 a.m.	Henry Hall Atrium 107
Walters, Timothy	Student	9:00 a.m.	Kirkhof Center GRR 140
Warren, Dena	Student	9:00 a.m.	Kirkhof Center GRR 135
Watts, Keith	Mentor	9:00 a.m.	Kirkhof Center GRR 021
Weber, John	Mentor	9:00 a.m.	Kirkhof Center GRR 076
Weekley, Ayana	Mentor	9:00 a.m.	Kirkhof Center 2270
Weekley, Ayana	Mentor	9:00 a.m.	Henry Hall Atrium 059
Weekley, Ayana	Mentor	9:00 a.m.	Kirkhof Center GRR 064
Weekley, Ayana	Mentor	9:00 a.m.	Kirkhof Center GRR 089
Weekley, Ayana	Mentor	9:00 a.m.	Kirkhof Center GRR 122
Weekley, Ayana	Mentor	9:00 a.m.	Kirkhof Center GRR 068
Weekley, Ayana	Mentor	9:00 a.m.	Kirkhof Center GRR 069
Weekley, Ayana	Mentor	9:00 a.m.	Henry Hall Atrium 055
Weekley, Ayana	Mentor	11:30 a.m.	Kirkhof Center 2266
Weibel-Swanson, Deana	Mentor	11:00 a.m.	Kirkhof Center 2270
Weiss, Thomas	Student	2:00 p.m.	Henry Hall Atrium 022
Wentworth, Grace	Student	9:00 a.m.	Kirkhof Center GRR 055
Wesley, John	Student	9:00 a.m.	Kirkhof Center GRR 094

Wheeler, Jessica	Student	3:00 p.m.	Henry Hall Atrium 007
Wheeler, Jessica	Student	1:00 p.m.	Henry Hall Atrium 021
Wiersma, Carly	Student	11:00 a.m.	Henry Hall Atrium 034
Wilcox, Danielle	Student	10:00 a.m.	Henry Hall Atrium 089
Wilkinson, Julia	Student	9:00 a.m.	Kirkhof Center GRR 138
Wilkinson, Steven	Student	9:00 a.m.	Kirkhof Center GRR 142
Wilkinson, Steven	Student	10:00 a.m.	Kirkhof Center GRR 081
Williams, Erika	Student	9:00 a.m.	Kirkhof Center GRR 042
Williams, Todd	Mentor	10:30 a.m.	Kirkhof Center 2266
Williams, Zoie	Student	11:00 a.m.	Kirkhof Center GRR 080
Wilson, Erin	Student	11:00 a.m.	Kirkhof Center 2270
Wilson, Julian	Student	9:00 a.m.	Kirkhof Center GRR 129
Wilterdink, Kendall	Student	10:00 a.m.	Kirkhof Center GRR 012
Winchell, Kelsey	Student	1:00 p.m.	Kirkhof Center GRR 027
Winchester, Randy	Mentor	9:00 a.m.	Henry Hall Atrium 095
Winkelman, Christina	Student	11:30 a.m.	Kirkhof Center 2201
Wittenbraker, Paul	Mentor	9:00 a.m.	MIP Library Exhibition Space 09
Wittenbraker, Paul	Mentor	9:00 a.m.	MIP Library Exhibition Space 06
Wittenbraker, Paul	Mentor	9:00 a.m.	MIP Library Exhibition Space 11
Wittenbraker, Paul	Mentor	9:00 a.m.	Library Main Floor Video Display
Wittenbraker, Paul	Mentor	4:00 p.m.	MIP Library Multipurpose Room
Witucki, Laurie	Mentor	9:00 a.m.	Kirkhof Center GRR 011
Witucki, Laurie	Mentor	9:00 a.m.	Kirkhof Center GRR 039
Woldyk, Nicholas	Student	12:00 p.m.	Kirkhof Center GRR 093
Wolffe, Gregory	Mentor	9:00 a.m.	Kirkhof Center GRR 063
Wolffe, Gregory	Mentor	3:30 p.m.	Kirkhof Center 2270
Wolfgram, Mallory	Student	9:00 a.m.	MIP Library Exhibition Space 10
Wolford, Marlee	Student	9:00 a.m.	Kirkhof Center GRR 131
Wolfram, Alyssa	Student	10:30 a.m.	Kirkhof Center 2215
Wong, Alexander	Student	9:00 a.m.	Kirkhof Center GRR 130
Wright, Brandon	Student	10:30 a.m.	Kirkhof Center 2270
Wroblewski, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 138
Wroblewski, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 083

X

Xu, Shaowen	Student	11:00 a.m.	Kirkhof Center GRR 142
Xu, Shaowen	Student	10:00 a.m.	Kirkhof Center GRR 081

Y

Youker, Brandon	Mentor	11:00 a.m.	Kirkhof Center 2266

Z

Zahran, Ryan	Student	10:00 a.m.	Kirkhof Center GRR 084
Zettelmaier, Samantha	Student	9:00 a.m.	Henry Hall Atrium 106
Zettle-Sterling, Renee	Mentor	3:30 p.m.	Kirkhof Center 2201
Ziegler, Courtney	Student	11:00 a.m.	Kirkhof Center GRR 113
Zimmerman, Trisha	Student	1:00 p.m.	Kirkhof Center GRR 086

Online Schedule Builder

Updated Presentation Information in lieu of Printed Addendum

This book is printed with information current as of mid-February. Changes often occur after the print date, and are reflected online on the Schedule Builder.

To access the Schedule Builder:

1. Go to gvsu.edu/ours/ssd
2. Click on the “Schedule Builder” link
3. Login and follow instructions

We are here to help. Please let any SSD committee member or SSD volunteer know if you have any questions. You may also contact the Office of Undergraduate Research and Scholarship at ours@gvsu.edu and/or 616-331-8100.

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